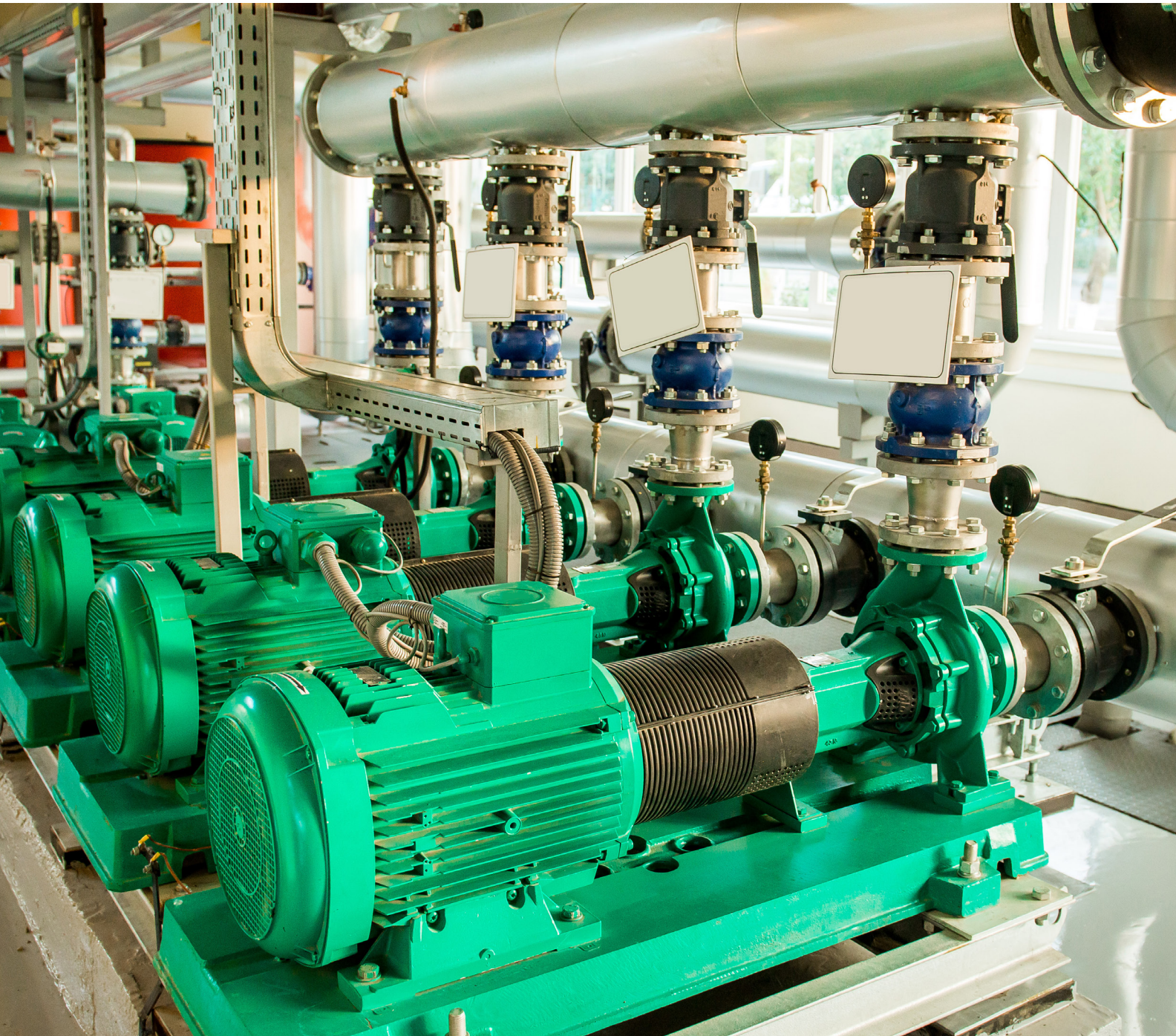




Mechanical Equipment Rooms

Safety & Best Practices for Gas Leak Detection



WE KNOW WHAT'S AT STAKE.

Importance of Monitoring Refrigerant and Combustible Gases Within Mechanical Rooms

A building's mechanical room is the hub of its heating, ventilation, and air conditioning system. This can include central utility plants, boiler and chiller rooms, mechanical and electrical rooms, and fuel rooms. The equipment within these rooms has the potential to leak harmful combustible or toxic gases, including costly and environmentally harmful refrigerant gases.

Refrigerant gas is considered a toxic gas and although refrigerants have low toxicity, at high concentrations they can displace oxygen. Oxygen deficiency can cause serious injury or death to workers. Furthermore, these chemicals are controlled substances by the Environmental Protection Agency, which means not only are they dangerous to worker health and safety, but they are harmful to the environment. Many of these refrigerants are categorized as ozone depleting substances and are highly monitored. Gas monitors satisfy the requirements for equipment room emissions included in EPA regulations.

In addition to the Environmental Protection Agency, there are specific requirements of ASHRAE Standard 15 and applicable local building codes.

ASHRAE Standard 15 states:

- Each machinery room shall contain a detector located where a refrigerant leak would concentrate.
- The detector shall trigger an audible and visual alarm both inside and outside the mechanical room and activate mechanical ventilation.

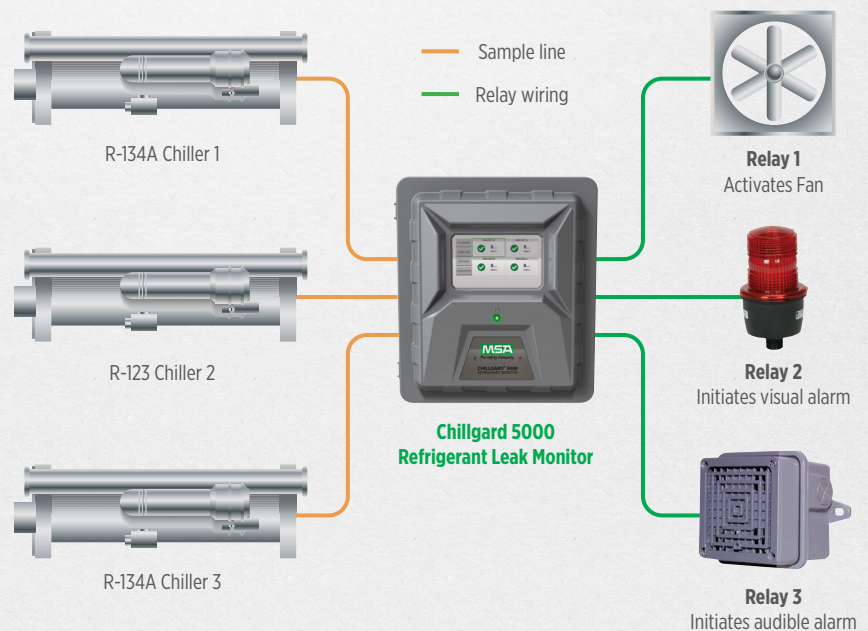
For economic reasons refrigerant leak detection is encouraged due to costs associated with refrigerant leaks.

The Complete Solution

The MSA Chillgard® 5000 Refrigerant Leak Monitor is the most selective and sensitive refrigerant leak detector on the market. With the ability to read down to 1 ppm, this monitor provides the earliest response to leaks. It helps minimize unnecessary maintenance costs associated with calibration and sensors by using a centralized sample draw system.

This system keeps users in compliance with ASHRAE 15 by offering a wide variety of horns and strobes for entry way signaling. The Chillgard 5000 Refrigerant Leak Monitor is equipped with five internal relays for fault, three levels of alarm, and an external horn option.

The Chillgard 5000 Refrigerant Leak Monitor has integrated BACnet and Modbus for direct digital communication back to a centralized control system. BACnet protocol allows for non-intrusive gas concentration monitoring and alarm status. No configuration is necessary, data is automatically mapped into the database upon protocol selection.



Monitor Location

- Mount the unit vertically; do not mount the unit to a structure subject to vibration and shock such as piping.
- Do not locate the unit near an excessive heat source, direct solar heating, or in a wet and damp location.
- For proper cooling, allow at least three inches clearance around all surfaces except mounting surface.



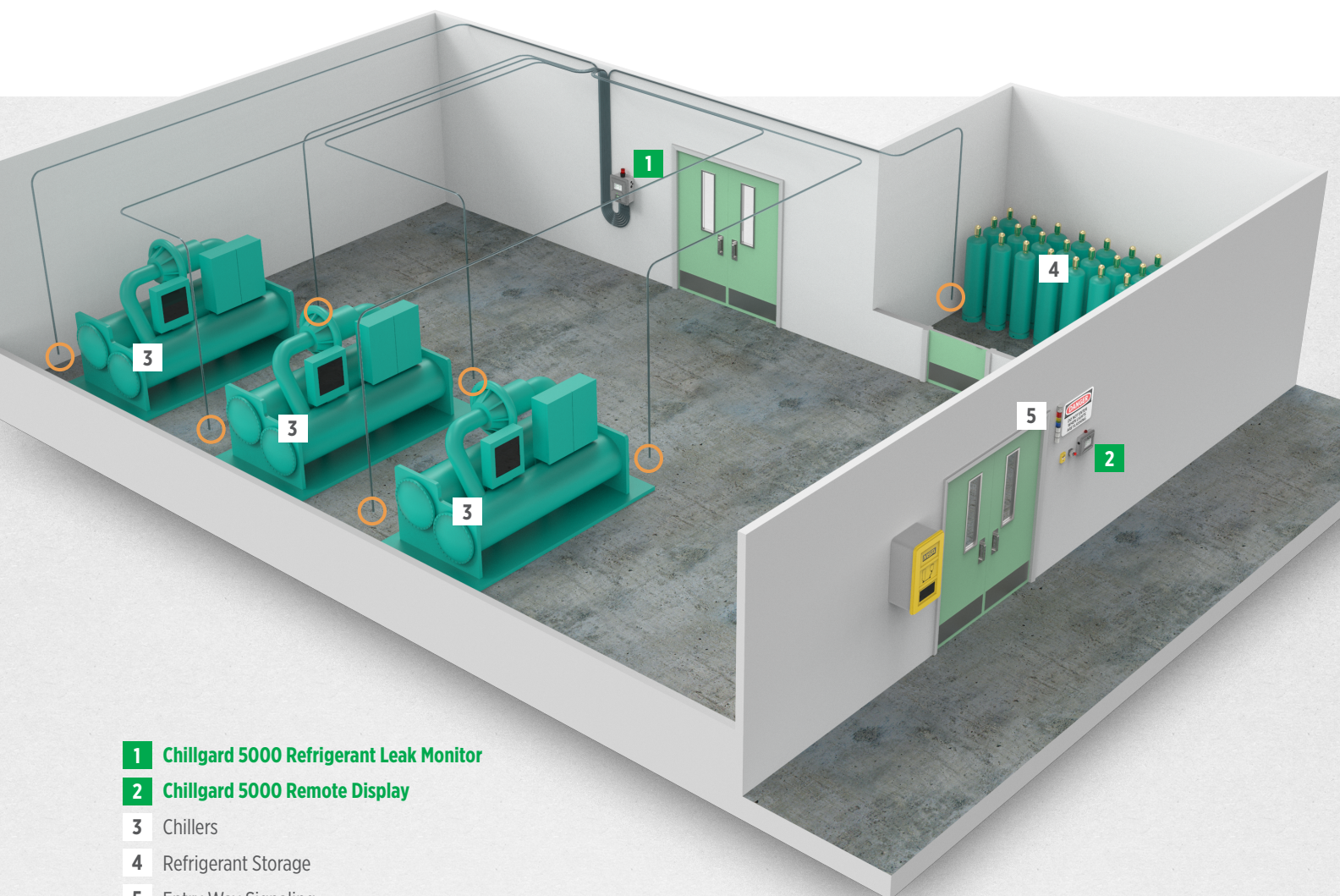
**Chillgard 5000
Refrigerant Leak Monitor**



**Chillgard 5000
Remote Display**

Guidelines for Locating the Sample Points

- A sample point may be remotely located up to 150 ft. (46 m) from the monitor (500 ft. [152 m] for 0.18" [4.6 mm] ID tubing) in an area where refrigerant vapors are most likely to leak or accumulate.
- It is widely accepted to locate the sample point near the barrel of the chiller and on adjacent corners to enhance the ability to monitor leaks.
- As refrigerants are heavier than air, monitor the refrigerant in locations like pits, stairwells, and trenches.
- If possible, monitor the vent line of the chiller.
- Remember to monitor the cylinder storage area if inside or near the chiller room in case of cylinder leakage.



1 Chillgard 5000 Refrigerant Leak Monitor

2 Chillgard 5000 Remote Display

3 Chillers

4 Refrigerant Storage

5 Entry Way Signaling

○ Sampling Points

Mechanical Equipment Rooms



Entry Way Setup

- 1 Chillgard 5000 Remote Display
- 2 G1 Industrial SCBA
- 3 Strobe & Sound Tower
- 4 Admittance Sign
- 5 Pull Station
- 6 Push Button



Chillgard 5000 Remote Display



G1 Industrial SCBA



Entry-Way Signaling Devices

	Part Number	Description		
ACKNOWLEDGE BUTTON	10186427	Acknowledge button		
PULL STATION	10186426	Pull station		
	Part Number	Lens Color / integrated horn	Voltage	Environmental Rating
STROBES/BEACONS	634674	Red flashing strobe	12-48 VDC	Indoor/outdoor use, NEMA 4X, IP66
	10058753	Red flashing strobe	12-48 VDC	Indoor/outdoor use, NEMA 4X, IP66
	10058752	Red flashing strobe	120VAC	Indoor/outdoor use, NEMA 4X, IP66
	10057838	Red flashing strobe, 70 dB sound module	24 VAC/DC	NEMA 1
	10057839	Red flashing strobe, 70 dB sound module	120VAC	NEMA 1
	10057841	Red/blue strobe, 70 dB sound module	24 VAC/DC	NEMA 1
	10057842	Red/blue strobe, 70 dB sound module	115VAC	NEMA 1
	10057844	Red/amber/blue strobe, 70 dB sound module	24V AC/DC	NEMA 1
	10057845	Red/amber/blue strobe, 70 dB sound module	115VAC	NEMA 1
HORNS	056247	Horn, wall-mount, aluminum housing, 110 dB	115VAC	4X, IP65
	10035633	Horn, wall-mount, plastic housing, 110 dB	24V	4X, IP65
	Part Number	Description		
ACCESSORIES	10076056	Admittance sign, 10" x 14" (254 x 356 mm), plastic, "Danger, Do Not Enter If Lights Are Flashing"		

Mechanical Equipment Rooms



Wall-mounted
Storage Cabinet

G1 Industrial
SCBA



SCBA Cylinders

Note: Not a requirement by ASHRAE, but may be required per local building codes

Self-Contained Breathing Apparatus & Accessories

	Part Number	Description
G1 INDUSTRIAL SCBA	10215805	Low-pressure 30-min. aluminum cylinder, nylon harness without padding and chest strap, medium G1 Facepiece with polyester head harness, hard case included
	10215806	Low-pressure 30-min. aluminum cylinder, nylon harness without padding and chest strap, medium G1 Facepiece with polyester head harness, no case
	10215807	High-pressure 45-min. low-profile carbon cylinder, nylon harness with shoulder and lumbar pads, no chest strap, medium G1 Facepiece with polyester head harness, hard case included
	10215808	High-pressure 45-min. low-profile carbon cylinder, Kevlar harness with shoulder and lumbar pads, no chest strap, metal cylinder band, medium G1 Facepiece with 4-pt. Kevlar head harness, hard case included
	Part Number	Description
SCBA CYLINDERS & ACCESSORIES	10213697	G1 30-minute Cylinder, threaded remote connection, aluminum, 2216, with air
	10213701	G1 30-minute Cylinder, threaded remote connection, aluminum, 2216, LESS air
	10213698	G1 30-minute Cylinder, quick-connect, aluminum, 2216, with air
	10213702	G1 30-minute Cylinder, quick-connect, aluminum, 2216, LESS air
	10052744	Case, wall-mounted, 6.75" diameter cylinder
	10052745	Case, wall-mounted, 5.25" small diameter cylinder



Boiler Room Monitoring

In addition to monitoring for refrigerant leaks, it is important to monitor your mechanical room's boiler equipment to ensure an adequate supply of combustion air and to help reduce the build-up of a flammable gas concentration. MSA offers a line of gas detectors that have the ability to work as a stand-alone system.

Several solutions would be an Ultima® X5000 Gas Monitor with a combustible sensor or a Z-Gard® MPO BACnet S Sensor for LEL detection. When locating the sensors keep in mind that natural gas is lighter than air; therefore, gas sensors should be located over potential leak areas such as: the gas shutoff valve, air intake, gas meter, and the burner assembly as well as the gas train assembly.

Ultima X5000
Gas Monitor



Z-Gard MPO
BACnet S Sensor



MSA—The Safety Company

Established in 1914, MSA Safety Incorporated is the global leader in the development, manufacture, and supply of safety products that protect people and facility infrastructures. Many MSA products integrate a combination of electronics, mechanical systems, and advanced materials to protect users against hazardous or life-threatening situations. The company's comprehensive product line is used by workers around the world in a broad range of markets, including the oil, gas, and petrochemical industry, the fire service, the construction industry, mining, and the military. MSA's core products include self-contained breathing apparatus, fixed gas and flame detection systems, portable gas detection instruments, industrial head protection products, firefighter helmets and protective apparel, and fall protection devices. With 2020 revenues of \$1.35 billion, MSA employs approximately 5,200 people worldwide. The company is headquartered north of Pittsburgh in Cranberry Township, PA, and has manufacturing operations in the United States, Europe, Asia, and Latin America. With more than 40 international locations, MSA realizes approximately half of its revenue from outside North America. For more information visit MSA's web site at www.MSAsafety.com.

Our Mission

MSA's mission is to see to it that men and women may work in safety and that they, their families, and their communities may live in health throughout the world.

MSA: WE KNOW WHAT'S AT STAKE.

Note: This Bulletin contains only a general description of the products shown. While product uses and performance capabilities are generally described, the products shall not, under any circumstances, be used by untrained or unqualified individuals. The products shall not be used until the product instructions/user manual, which contains detailed information concerning the proper use and care of the products, including any warnings or cautions, have been thoroughly read and understood. Specifications are subject to change without prior notice. MSA is a registered trademark of MSA Technology, LLC in the US, Europe, and other Countries. For all other trademarks visit <https://us.msasafety.com/Trademarks>.

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