

Mechanical **Equipment Rooms**

Safety and Best Practices



*Because every life has a **purpose...***

Mechanical **Equipment Rooms**

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 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.

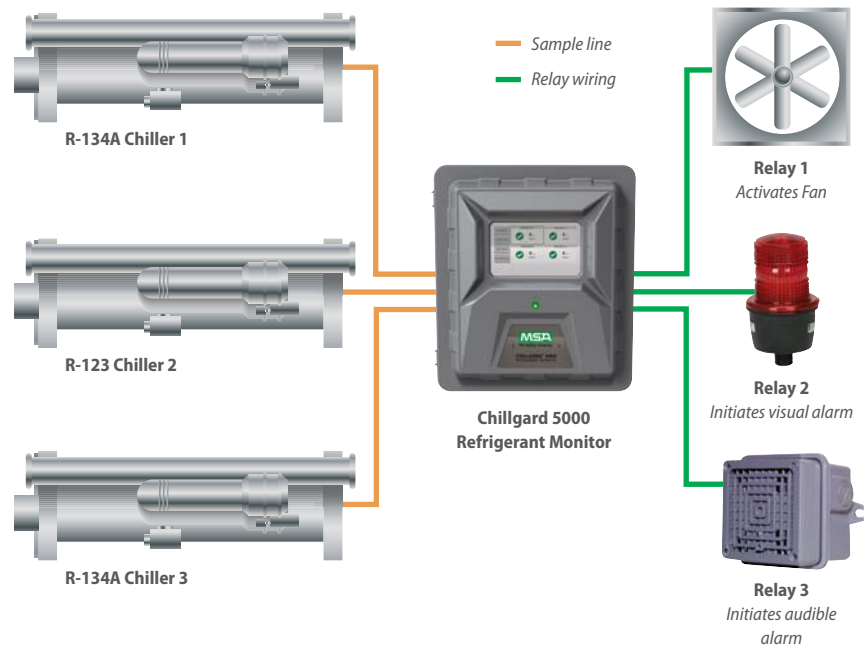
For economic reasons refrigerant leak detection is encouraged due to costs associated with refrigerant leaks.

The Complete Solution

The Chillgard® 5000 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. 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 is equipped with five internal relays for fault, three levels of alarm and an external horn option.

The MSA Chillgard 5000 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.

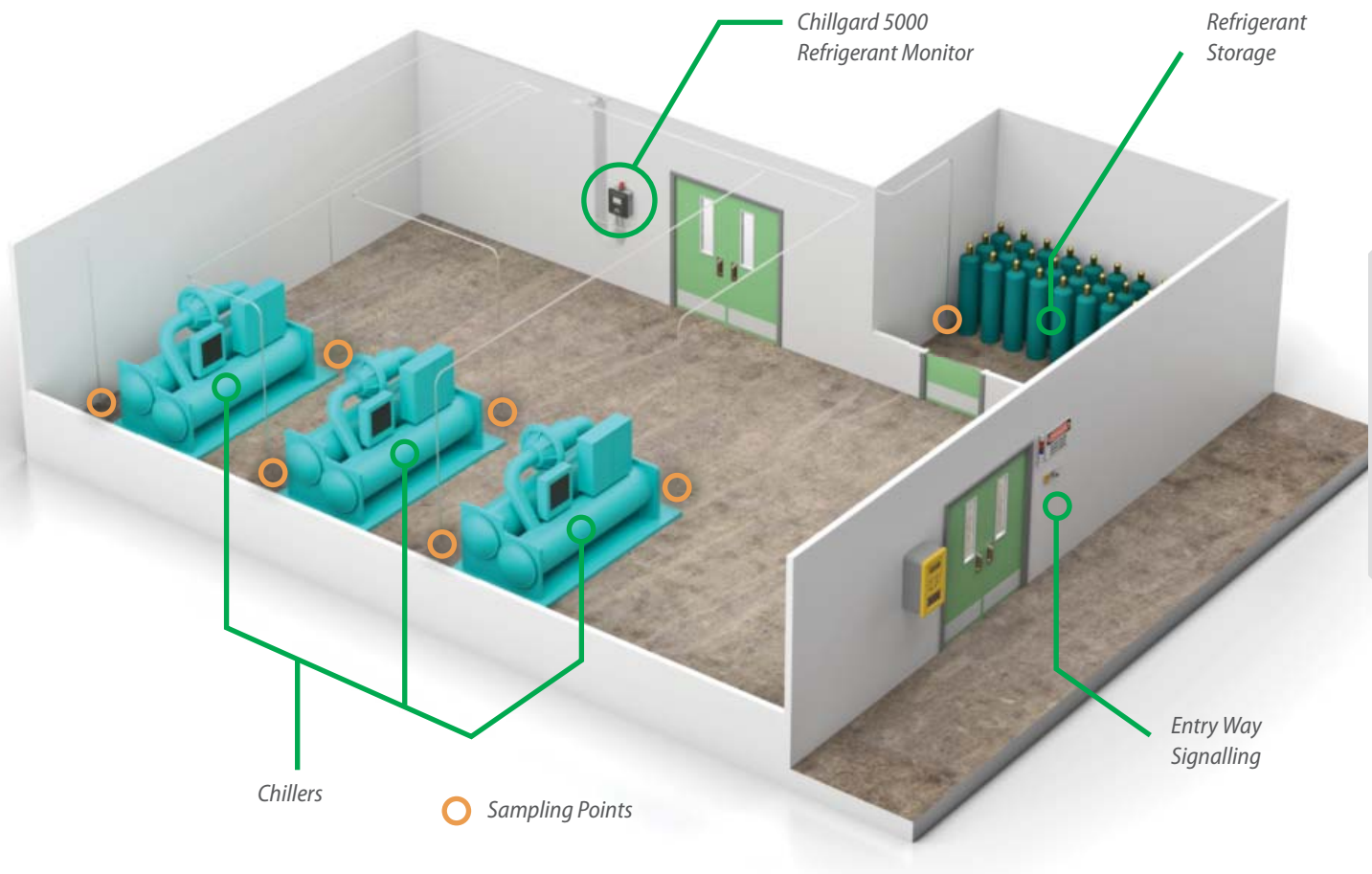


Monitor Location

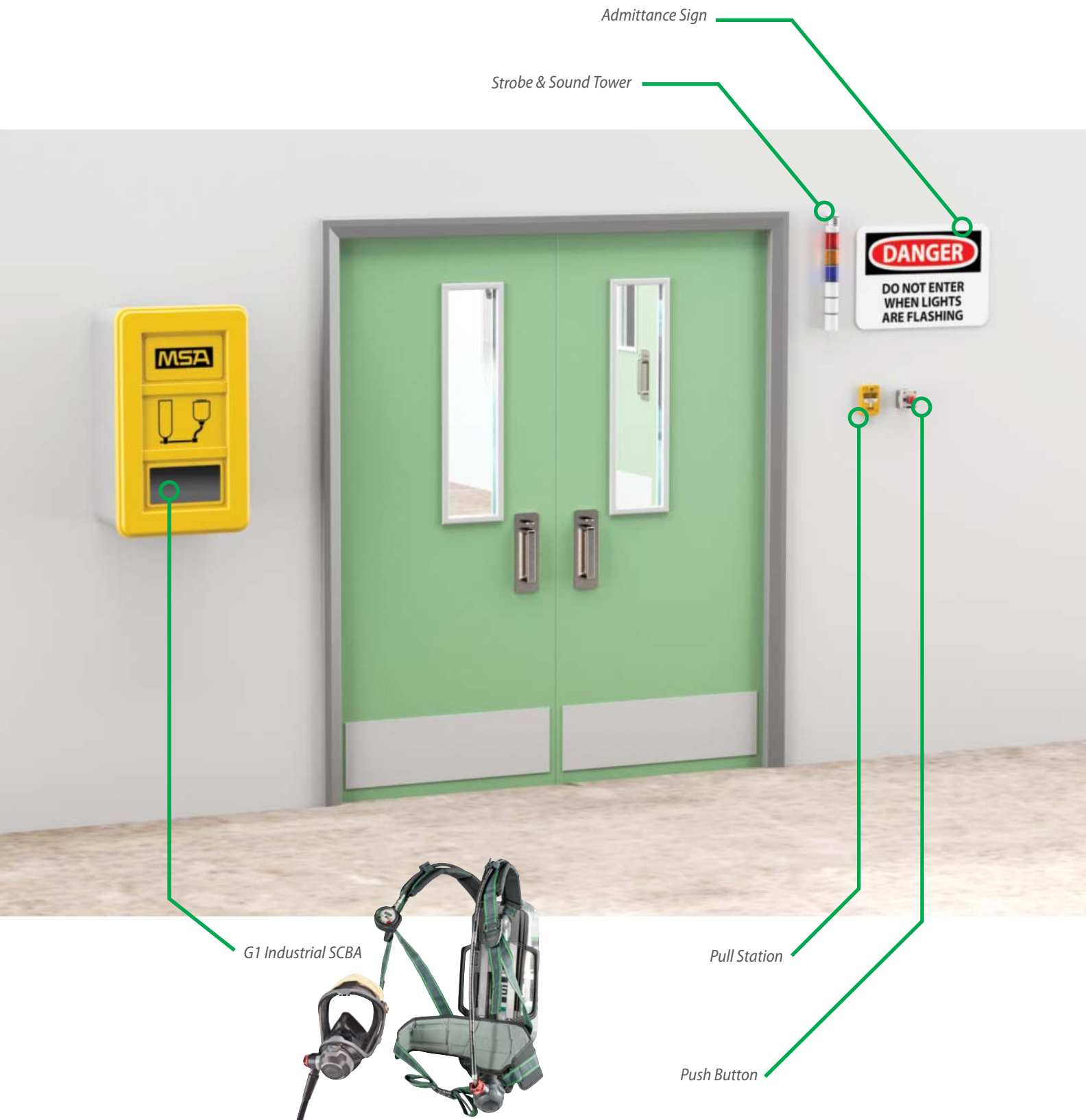
- Mount the unit vertically; do not mount the unit to structure subject to vibration and shock such as piping
- Do not locate the unit near excessive heat source, direct solar heating or in a wet and damp location
- For proper cooling, allow at least three inches clearance around all surfaces except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

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 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



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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, 70dB sound module | 24 VAC/DC | NEMA 1 |
| | 10057839 | Red flashing strobe, 70dB sound module | 120VAC | NEMA 1 |
| | 10016789 | Red flashing strobe, 85dB sound module | 24V AC/DC | 4X outdoor |
| | 10016820 | Red flashing strobe, 85dB sound module | 115VAC | 4X outdoor |
| | 10057841 | Red/blue strobe, 70dB sound module | 24 VAC/DC | NEMA 1 |
| | 10057842 | Red/blue strobe, 70dB sound module | 115VAC | NEMA 1 |
| | 10057844 | Red/amber/blue strobe, 70dB sound module | 24V AC/DC | NEMA 1 |
| | 10057845 | Red/amber/blue strobe, 70dB sound module | 115VAC | NEMA 1 |
| HORNS | 056247 | Horn, wall-mount, aluminum housing, 110dB | 115VAC | 4X, IP65 |
| | 10035633 | Horn, wall-mount, plastic housing, 110dB | 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" | | |

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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 | 10190422 | Low-pressure 30-min. aluminum cylinder, nylon harness without padding and chest strap, medium G1 Facepiece with polyester head harness, hard case included |
| | 10190423 | Low-pressure 30-min. aluminum cylinder, nylon harness without padding and chest strap, medium G1 Facepiece with polyester head harness, no case |
| | 10190471 | 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 |
| | 10190472 | 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 | 807586 | 30-minute L30 carbon 2216 psi cylinder & valve assembly |
| | 809872 | 30-minute L30 aluminum 2216 psi cylinder & valve assembly |
| | 10058408 | DVD instructional video, AirHawk II MMR SCBA |
| WALL-MOUNTED STORAGE CABINETS | 10052744 | Wall cabinet for one SCBA with aluminum cylinder, includes brackets |
| | 10052745 | Wall cabinet for one SCBA with L30, 2216 psi, 30-min cylinder, includes brackets |



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 detectors that have the ability to work alone as a stand-alone system.

Recommended solution would be an Ultima® X5000 Gas Detector with a combustibile 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 Detector*



*Z-Gard MPO
BACnet S Sensor*

MSA—The Safety Company

Our business is safety. We've been the world's leading manufacturer of high-quality safety products since 1914. MSA products may be simple to use and maintain, but they're also highly-sophisticated devices and protective gear—the result of countless R&D hours, relentless testing and an unwavering commitment to quality that saves lives and protects millions of hard working men and women each and every day. Many of our most popular products integrate multiple combinations of electronics, mechanical systems and advanced materials to help ensure that users around the world remain protected in even the most hazardous of situations.

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: Because every life has a purpose.

Note: This Bulletin contains only a general description of the products shown. While uses and performance capabilities are described, under no circumstances shall the products be used by untrained or unqualified individuals and not until the product instructions including any warnings or cautions provided have been thoroughly read and understood. Only they contain the complete and detailed information concerning proper use and care of these products.



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MSA – The Safety Company

1000 Cranberry Woods Drive
Cranberry Township, PA 16066 USA
Phone 724-776-8600

www.MSAsafety.com

U.S. Customer Service Center

Phone 1-800-MSA-2222
Fax 1-800-967-0398

MSA Canada

Phone 1-800-672-2222
Fax 1-800-967-0398

MSA Mexico

Phone 01 800 672 7222