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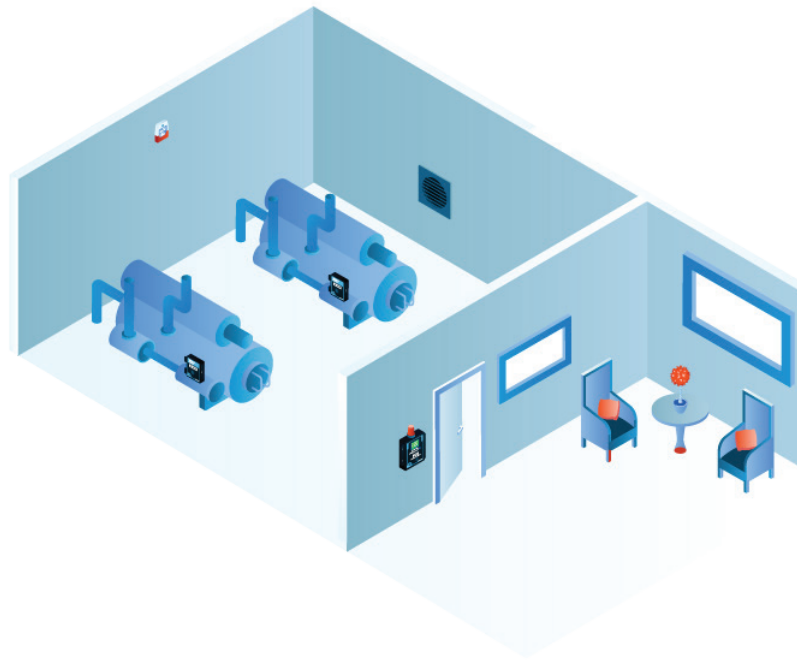
Continuous monitoring of refrigerants in mechanical rooms with two chillers.

Early detection of a refrigerant leak in a mechanical equipment room can prevent dangerous health implications to occupants, minimize significant loss of refrigerant and reduce additional energy costs.

Using Critical Environment Technologies' **FCS 4** channel Flexible Control System Controller and two **CGAS-D-IR** Infrared Refrigerant Transmitters is the solution. Infrared gas sensors are low maintenance, have a long life span and provide the highest degree of sensor accuracy at low gas concentrations. The gas detectors should be permanently installed near the chiller equipment in an area where a leak is most likely to concentrate.

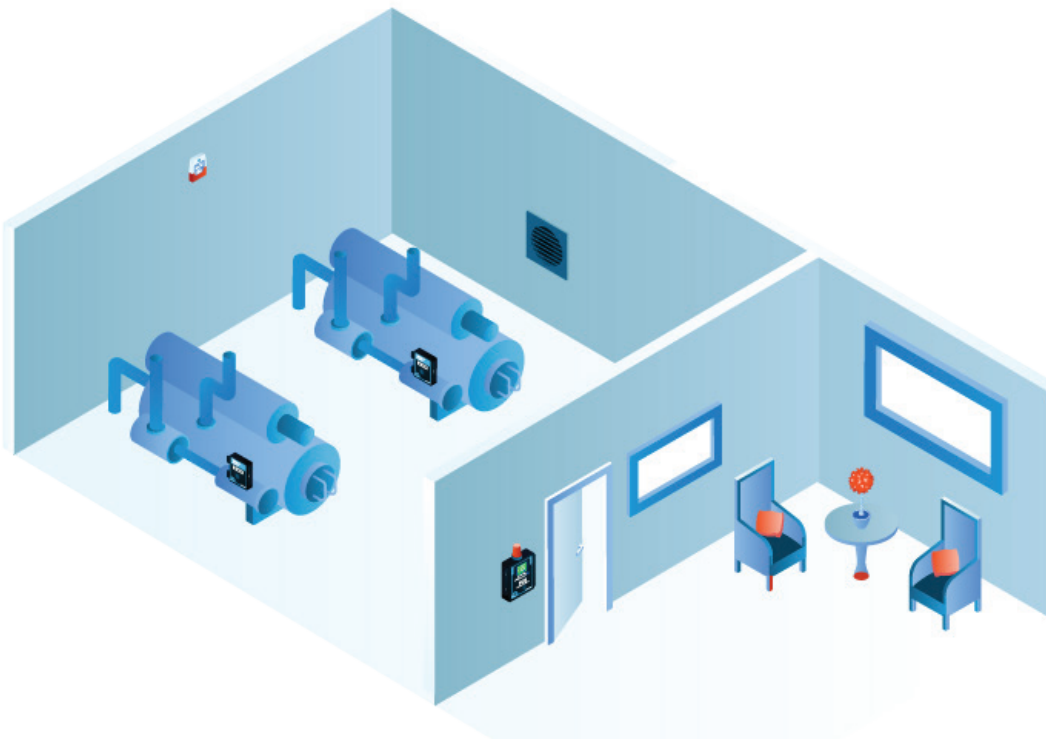
The **FCS** Controller should be installed outside the door of the mechanical room, and be equipped with a top mounted strobe and a manual shut off switch which meets B-52 Mechanical Refrigeration Code requirements.

When gas level readings reach a predetermined level, the **CGAS-D-IR** will trigger its own alarm and send a signal to the **FCS** which in turn will trigger audible alarms and activate the mechanical ventilation system and call emergency response as configured.



Inside the mechanical room, two CGAS-D-IR transmitters, each with an internal infrared refrigerant sensor should be placed in the areas where a refrigerant leak is most likely to concentrate and where pooled refrigerant is likely to accumulate. Refrigerant gases are heavier than air and will concentrate closer to the floor and in areas with less air current. Each CGAS-D-IR transmitter should be mounted 10" to 18" off the floor so it is at an appropriate height for detection and accessible for routine calibration and maintenance. Gas measurement readings will be transmitted to the FCS Flexible Control System Controller and will be viewable on its display.

The FCS Controller with a top mounted strobe and manual shut off switch (meets B52 requirements) should be mounted outside the mechanical room entry door. It will communicate with the CGAS-D-IR refrigerant transmitter(s) inside the room and will display the target gas levels for viewing prior to entering the room.



The FCS is pre-programmed and field adjustable.

Configurable settings include relay assignment, time delays, logic control, sensor types and ranges, alarm setpoints, etc. The FCS has 4 relays that can be configured to activate the exhaust ventilation system, trigger onboard and remote alarms and other procedures as appropriate. The same gas detection system is available with analog inputs and CGAS-A transmitters. Either system can be configured with an optional AO module that offers four 4-20 mA outputs. The FCS is available with BACnet® or Modbus® output

to a building automation system. Up to a maximum of four transmitters can be connected to the FCS-4. If more than 4 channels are required, other models of the FCS are available that offer 8, 32 or up to 64 analog channels.

The FCS should be equipped with a top mounted strobe and a manual shut off switch (meets B52 code requirements). The manual shut off switch can be used to shut off the chiller equipment. Remote visual and audible alarm devices such as the Remote Strobe & Horn (RSH-24V-R) should be set up inside the room and if there is another entrance to the room, an RDM Remote Display Module with a side mounted strobe should be mounted outside the door of that entrance to provide visual confirmation of gas level readings prior to entering the room.

Using infrared sensor technology will ensure the highest degree of sensor accuracy especially when the monitoring area may have other contamination gases or multiple refrigerants in the same area. Infrared refrigerant sensors should not be used in locations that have corrosive chemicals such as chlorine, ammonia and other oxidizers that are present, especially if there is a higher humidity level.