

# Gas Detection in Chiller Applications

## Why do I need a refrigerant leak monitor?

The need to install refrigerant leak monitors in chiller applications / installations arises from legislation and industry standards as well as cost and environmental issues.

### Ozone Depleting Substances

European community regulation 2037/2000 on ozone depleting substances became effective from 01 Oct 2000 -and is directly applicable in law in all EC countries. It states, "All precautionary measures practicable shall be taken to prevent and minimise leakages of refrigerants from refrigeration and air-conditioning systems".

Practicable measures are outlined in the industry standard EN 378. Compliance with this standard should, in the opinion of the Institute of Refrigeration, meet your 'duty of care'.

### EN378 2008

The standard specifies the installation of fixed refrigerant leak detectors in machinery rooms of both existing and new systems of any size with a few exceptions for small and self-contained systems and in the case of direct systems such as VRV/VRF when the concentration of the refrigerant may exceed the practical limit in accordance with EN 378-1:2008, Annex C,

### F GAS

The Global Warming EC law / Regulation (EC) no 842/2006 which has recently come into force, 4/7/2007, requires the installation of monitors in applications with 300 kg or more of refrigerant. It also allows reduced inspection frequencies if fixed monitors are installed.

Applications are defined in Article 3 on Containment as: refrigeration, air conditioning and heat pump equipment, including their circuits as well as fire protection systems, which contain fluorinated greenhouse gases listed in Annex 1, Operators shall, using all measures which are technically feasible and do not entail disproportionate cost

- prevent leakage of these gases, and,
- as soon as possible repair any detected leakage

## How to monitor chillers

Leaks generally occur at compressors or in the condenser sections.

### Machinery Rooms

Chiller installations can be monitored using standard Murco sensors. You can employ point detection i.e. you monitor at a particular point of concern such as the compressor, or you can use perimeter protection where you place sensors around a chiller or around the walls of the machinery room. With heavier than air gas the sensor should be mounted low.

If mechanical ventilation is fitted sensors should be downwind of the equipment to be monitored. A sensor may be fitted on the wall below the fan or an airflow sensor may be fitted at the fan face.

### Air Cooled / Roof Top Units

It is difficult to monitor reliably for leaks outdoors however depending on the design of the equipment you can:

- Install standard sensors in enclosed machinery sections, compressor enclosures, or behind protective panels such as acoustic panels.
- Fit IP66 fast response sensors below compressors or low down in condenser sections. You can use the IP66 sensor with a remote head to allow you to fit the head in difficult access areas so you have easy access to the sensor enclosure for maintenance or calibration.
- You can fit airflow sensor below or above fans to monitor for leaks in the condenser sections. If there is a particular fan start up sequence you can locate airflow sensor in the start up sections so as to detect any accumulated leaks on start up.

## Murco Products

Why use a Gas Leak Detector? To reduce costs, to comply with legislation / standards in the industry and to protect the environment.

### MGD Range

Is a stand-alone Gas Monitoring system with preset alarm levels. Consisting of MGD Control Panels with 2, 4, or 6 remote MGD Sensors, with one or two levels of alarm. The controller provides audible and visual alarms and a relay at each of the preset alarm levels, 10 Amp at 230 VAC may be used to activate external alarms or connect to another control system, or BMS.



### MGS Range



A state-of-the-art gas sensor, which detects all refrigerant gases. It determines continuously the gas level present in an area, room, zone, air space or airflow. It is a universal solution as it interfaces with any controller, BMS or SCADA system through:

- Analogue Outputs: 0-5V, 0-10V, 1-5V, 2-10V or 4-20mA
- Digital Output: one relay, 1 Amp at 23Vdc
- Audible and visual alarm, fault / sensor fault condition indication.
- Reliable, real-time continuous monitoring, no blocked filters, tubes, sample transport delays or technical and maintenance problems as experienced by aspirated systems.

Standard MGD or MGS sensor (IP41) are used in machinery room applications or outdoor units in machinery sections or protected areas.

Optional Sensor Housings are available for both of the above ranges.



**IP66:** Humidity, Water Spray and dust protection enclosure with Stainless Steel sensor head for fast response and high humidity areas. For outdoor applications mount below compressors, or low down in condenser sections. Also available with remote head on 5M cable for remote mounting.



**IP66/Airflow** - For monitoring airflow to/from fans or in a duct/AHU.



Standard Housing with 1" BSP threaded head to monitor Pressure Relief Valves, normally teed off Vent Pipes.



**IP66/Housing** with 1" BSP thread. For outdoor use.