

# REFRIGERANT GAS MONITORING SOLUTIONS

Early detecting of refrigerant leaks can save you money, save the environment and help eliminate health risks.

MARCH 2022



# REFRIGERANT GAS MONITORING

Early detection of refrigerant leaks can help prevent significant loss of refrigerant, excess energy costs, emergency response costs and danger to people who are inside or want to enter the room.



Low levels of refrigerants via leakage reduce the efficiency of your air conditioner, can cause the compressor to fail and can even freeze the evaporator coil. Many refrigerants can damage the ozone layer if released into the atmosphere, while others are potent greenhouse gases.

From a health perspective, some refrigerants are toxic to health and others, even though non-toxic at low levels, can cause health issues such as nausea, headache and even asphyxiation at very high levels.

**Kenelec Scientific supply a range of gas sensors from Critical Environment Technologies (CET) for accurate and reliable detection of common refrigerant gases across a range of applications and price points.**

## SOLID STATE SENSORS

For many refrigeration applications, using solid state sensors will provide an economical and reliable gas detection solution. Solid state sensors are reliable if used in a clean area with very little temperature and humidity changes. Solid State refrigerant sensors **should not be used where there are other chemicals or gases present (other than refrigerants)**, such as alcohol based cleaners, fumes from running engines, fuel storage containers, etc.



**LPT-A Analog Transmitter**



**cGas Detector Digital Transmitter**



**cGas-P Detector for Indoor Public Spaces**

# INFRARED SENSORS



Using infrared sensor technology will ensure the highest degree of sensor accuracy if monitoring an area **where there are 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 oxidisers that are present, especially if there is a higher humidity level.

## ART Infrared Refrigerant Transmitter

### COMPARISON:

#### SOLID STATE

#### VS

#### INFRARED

	SOLID STATE	INFRARED
<b>Application</b>	General purpose gross leak detection, applicable to most refrigerants	High accuracy, gas-specific detection, but not applicable to all refrigerants
<b>How it Works</b>	Metal oxide changes resistance in response to the presence of target gas; the change is measured by the electronics of the detector to determine the gas concentration	Gas molecules absorb the infrared light of the optical sensor at a certain wave length; the wave length is measured by the electronics of the detector to determine the gas concentration
<b>Gases Detected</b>	R22, R134A, R402A, R404A, R407C, R410A, R422D, R438A, R507A	R22, R32, R123, R134A, R404A, R407A, R407C, R407F, R410A, R422A, R422D, R427A, R448A, R449A, R452A, R507A, R513A, R514A, HFO1234YF, HFO1234ZE, HFO1234ZD
<b>Cost</b>	Economical	Expensive
<b>Replaceable</b>	Yes	No
<b>Output</b>	Non-linear	Linearized
<b>Gas Detection Range</b>	0 - 2,000 ppm	0 - 3,500 ppm
<b>Life Expectancy</b>	5 years	8 years
<b>Accuracy</b>	±10% of range @ STP	±5% of range @ STP
<b>Cross Sensitivity</b>	All common refrigerants and many compounds and gases	Not susceptible to cross contamination
<b>Response Time T90</b>	< 2 minutes	< 5 minutes
<b>Calibration</b>	Recommended once every 6 months	Recommended once every 12 months
<b>Operating Temperature</b>	-20°C to 40°C	-30°C to 40°C
<b>Operating Humidity</b>	15% to 90% non-condensing	5% to 90% RH non-condensing
<b>Sensitivity Drift</b>	Drift may either cause fail conditions or alarm conditions	Less susceptible to changes, <1% full scale per year (noncumulative)
<b>Replaceability</b>	SS sensors can be replaced in the field	IR sensors cannot be replaced as they are soldered and potted onto the board inside
<b>Effects of Humidity and Temperature Changes</b>	Sensitive to humidity and temperature changes	Minimally affected by humidity and temperature changes

# HOTEL APPLICATIONS

## HOTEL AIR CONDITIONING

Refrigerant leaks from in-room air conditioning can occur from wear and tear from continual use, improper operation, inadequate maintenance or any other cause. Leaking refrigerant evaporates into a gas and is harmful for the environment and for humans to inhale. In addition, the damage a leak can cause to the air conditioner components and the loss of refrigerant can add up to costly bills for the owner.



Typical Hotel Room Air Conditioner Leak Monitoring System; Source: CET Application Note

### SOLUTION:

#### cGas-P Detector

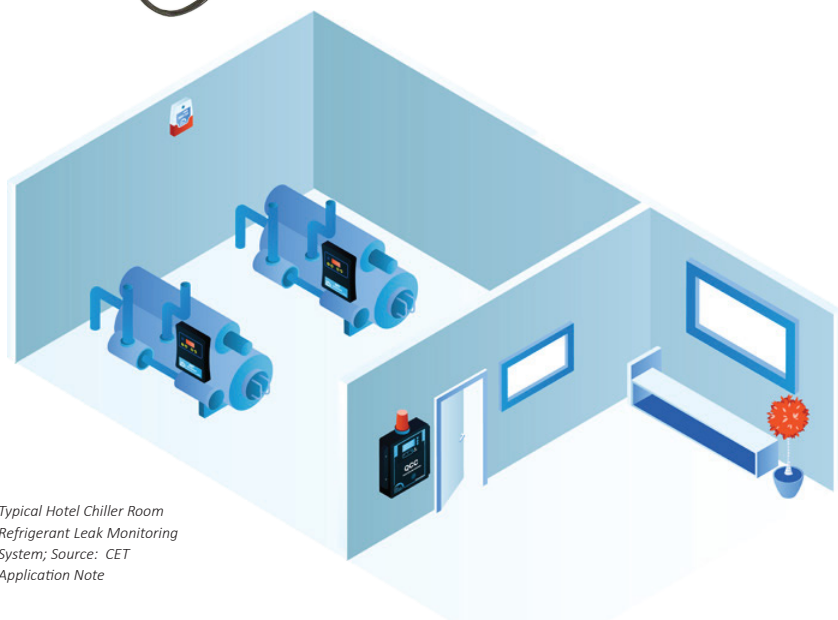
with remote refrigerant sensor

NEW



cGas-P is available as single or dual channel sensor, analog or digital output, with an aesthetically pleasing design to reduce noticeability in publicly occupied spaces such as hotels.

The internal sensor model is ideal for wall mounting flush. Remote sensor option allows the sensor to be placed as close to the leak area as possible. If a leak is detected, the relay in the cGas-P will quickly switch off the air conditioner. If a controller or Building Automation System (BAS) is used, the cGas-P will send a signal back to the control device to notify an alarm event has occurred.



Typical Hotel Chiller Room Refrigerant Leak Monitoring System; Source: CET Application Note

## HOTEL MECHANICAL / CHILLER ROOM

Typically, hotels have a mechanical equipment room where large chillers and pipes with refrigerant gas are tucked away to do their job cooling the establishment.

Chiller rooms should be continuously monitored in case leaks occur. Refrigerants can be toxic and in some cases flammable, and a cause concern for the health and safety of people.

If a leak is detected, the relay in the ART will quickly switch off the air conditioner or turn on ventilation systems. If a central controller is used, the ART will send a signal back to the central controller to notify an alarm event has occurred. If multiple potential leak locations are of concern, using up to four ART transmitters connected to a central controller will provide a complete leak detection system.

### SOLUTION:

#### ART Infrared Refrigerant Transmitter



# REFRIGERATION / CHILLER ROOM APPLICATIONS

## SINGLE CHILLER



### SOLUTION:

**ART Infrared Refrigerant Transmitter**



The ART gas detector mounted inside the room provides continuous monitoring for potential leaks. Gas level information from the ART is viewable on the central controller mounted outside of the room.

If a leak is detected, an audible alarm will sound, the display will indicate an alarm condition and the relay will activate a pre-set response, eg turning on a remote alarm device, turning off the chiller or actuating the mechanical ventilation system.

Typical Single Chiller Room Monitoring System; Source: CET Application Note

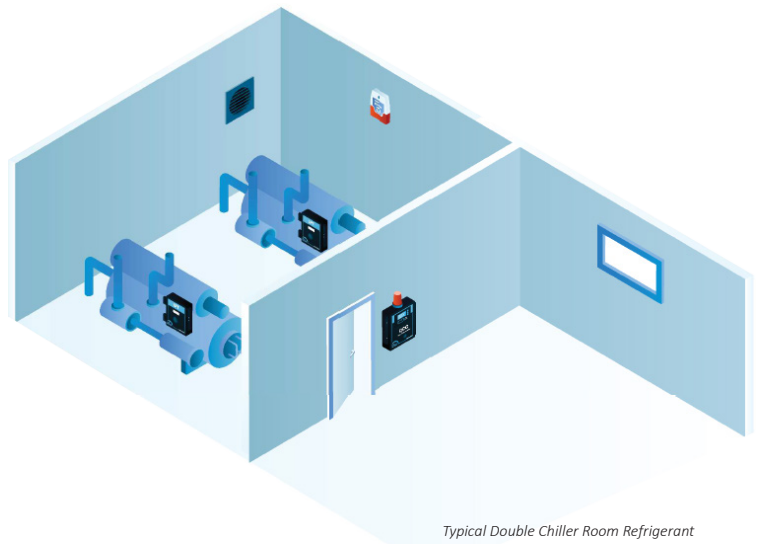
## DOUBLE CHILLER

### SOLUTION:

**LPT-A Analog Transmitter**  
with remote refrigerant sensor



The placement of two LPT-A transmitters inside the room provides continuous monitoring of potential leaks and their communication with the central controller with a top mounted strobe and manual shut off switch mounted outside the room door provides a status of the air quality conditions inside the room prior to entry.



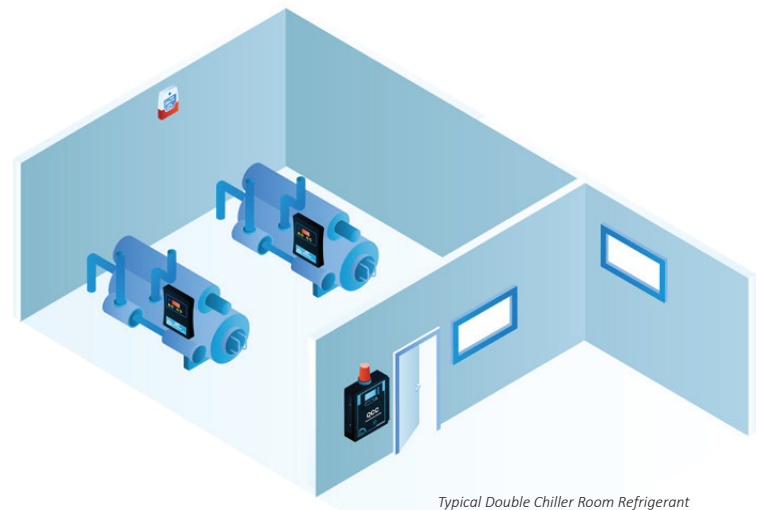
Typical Double Chiller Room Refrigerant Monitoring System with 2 x LPT-A transmitters; Source: CET Application Note

### SOLUTION:

**ART Infrared Refrigerant Transmitter**



Two ART transmitters inside the room provides continuous monitoring of potential leaks and their communication with the central controller. If a leak is detected an audible alarm will sound, and the relays will activate a pre-set response, such as turning on a remote alarm device, turning off the chillers or actuating the mechanical ventilation system.



Typical Double Chiller Room Refrigerant Monitoring System with 2 x ART transmitters; Source: CET Application Note

# KENELEC SCIENTIFIC

## Our company:

Established in 1962, Kenelec Scientific is one of Australia's leading scientific and environmental technology companies. Based in Melbourne, with distributors located throughout Australia and New Zealand, we are industry leaders in the supply of globally sourced, latest generation technologies at competitive prices.

## Our services:

### Sales

Buy the latest equipment from some of the most trusted brands in the industry.

### Rental

Short and long term hire available on an extensive range of instruments.

### Calibration

Professional calibration of your instruments in our accredited laboratories.

### Validation

Wide range of validation services to ensure compliance with regulations.

### Service & Repairs

Local after-sales service and support from our experienced technicians.

### Education

Product education and support available in-house, onsite or online.

### Financing

Secure your equipment without relying on up-front capital funding.

## More solutions

In addition to refrigerant monitoring sensors, we also supply the full range of CET controllers to get your system up and running.



### FCS-4 4 Channel System Controller

4 channel Controller with logic control for small to medium gas detection applications. Available with Modbus® or BACnet® output for communicating with a BAS, DDC or other control panel.

### DCC Dual Channel Controller

2 channel versatile self-contained Controller with VFD capabilities and flexible internal and/or remote sensor configurations.

Shown with top mounted strobe.



## Don't see your solution here?

Find more gas monitoring solutions on our website - visit [www.kenelec.com.au](http://www.kenelec.com.au) to view more of our range, or get in touch with our experienced team to discuss your specific requirements.



FS 605267

Kenelec Scientific Pty Ltd | ABN 88 064 373 717  
23 Redland Drive, Mitcham VIC 3132  
p 1300 73 22 33 | e [sales@kenelec.com.au](mailto:sales@kenelec.com.au) | w [www.kenelec.com.au](http://www.kenelec.com.au)

KS BROCHURE | REFRIGERANT | MAR22

We look forward to  
working with you.

