AMERICAN GAS SAFETY

VRF Detection Design Guide

Satisfying code by adding gas detection.

- 24VAC or DC 90-250VAC Power Input
- MODBUS BACnet 0-10V
- LED & Screen Versions
- Modular Selection of Outputs
- Modern & Compact Design
- In-Built Audible Alarm

Product Overview

The AGS VRF Refrigerant gas leak detector with NDIR sensor technology meets the need for a cost-effective and reliable solution to continuously monitor for refrigerant leaks that come from VRF systems. The detector is aesthetically designed for commercial applications, and features a low maintenance and high accuracy NDIR sensor.

VRF Applications

Designing over ASHRAE 15 Requirements? Try adding gas detection.

Some local jurisdictions allow for the use of refrigerant gas detection in occupied spaces where the volume requirements determined by ASHRAE 34 refrigerant concentration limits (RCL) can't be achieved .

ASHRAE®

$$\textit{total refrigerant charge } (lb) \times 1000 \div RCL\ (lb/1000\ ft^3)$$

$$77.85(lb) \times 1000 \div 26\ (lb/1000\ ft^3) = \boxed{2{,}994.07\ ft^3} \rightarrow \textit{minimum room volume allowed}$$

In rooms where the volume requirement can't be met, an AGSRG sensor is placed.

Case Study

Woodland Park - Colorado

A VRF system was designed for a hotel in Woodland Park, Colorado that utilized an innovated approach of refrigerant sensors to meet code. Instead of resorting to multiple independent systems to meet compliance with code regulations, refrigerant detection was strategically integrated into each room that did not conform to the ASHRAE volume requirements.

In accordance with ASHRAE 15 guidelines, when designing a chiller room that fails to comply with the ASHRAE RCL (refrigerant concentration limit) restrictions, the inclusion of a gas detection system becomes a crucial prereqeusite. A similar principle applies in specific jurisdiction when implementing VRF systems.

By adopting this solution, the hotel successfully streamlined its safety measures while optimizing operation efficiency and adherence to regulations.

Elevation - NDIR vs. Semiconductor

At an elevation of 8,500 feet, it was critical to know the gas detection system was able to operate in the environmental conditions. The NDIR sensors in the AGSR-NDIR work based on a principle that different gases with absorb infrared radiation produced by the sensor at specific wavelenghts, which is unaffected by elevation.

Alternatively, semi-conductor sensors were considered. Semi-conductor sensors rely on physical interaction with the gas molecules in the air and can be effected changes in atmospheric conditions, including reduced air pressure and lower oxygen levels. Decreases in atmospheric pressure can affect the sensitivity and response time of the semiconductor sensor.

Detectable Gases

GAS	Model#	Pre Alarm (PPM)	High Alarm (PPM)	Mounting Height
R-1234yf	RTFT-LITE-1234YF	175	1000	1ft A.F.F.
R-1234ze	RTFT-LITE-1234ZE	175	1000	1ft A.F.F.
R-449a	RTFT-LITE-449A	175	800	1ft A.F.F.
R-404a	RTFT-LITE-404A	175	1000	1ft A.F.F.
R-134a	RTFT-LITE-134A	175	1000	1ft A.F.F.
R-407c	RTFT-LITE-407C	175	1000	1ft A.F.F.
R-32	RTFT-LITE-32	350	1000	1ft A.F.F.
R-410a	RTFT-LITE-410A	350	1000	1ft A.F.F.
R-32	RTFT-LITE-32	350	1000	1ft A.F.F.

Connectivity

Modbus BACnet

I/Os	Analog Outputs	1x Linear 0-10V/2-10V Refrigerant PPM. Thermistor (10K3)
	Digital Networks	BACnet MS/TP / MODBUS RTU (Parity: None Data bit: 8bit Stop bit: 1)
	Relay Outputs	1x SPST 70mA

American Gas Safety

www.americangassafety.com

Head office:
6304 Benjamin Road, Suite 502, Tampa, FL 33634

Tel: (727) 608-4375
Email: info@americangassafety.com