VRF   
Refrigerant Gas Detection

VRF Refrigerant Detection System

PART 1 – GENERAL

1. RELATED DOCUMENTS
   1. Drawings and general provisions of the Contract, including General and Supplementary General Conditions and other Division 01 Specification Sections, apply to this Section
   2. SUMMARY
   3. Provide a complete installation of refrigerant gas monitors as required in conditioned spaces as specified on plans, or in rooms that do not comply with ASHRAE 15 minimum room volume requirements.
   4. The system shall include, but not be limited to, the following:
      1. VRF refrigerant gas detector with local alarm and BMS communication.
   5. SUBMITTALS
   6. Provide data for each factory supplied piece of equipment including model numbers.
   7. Shop Drawings
      1. Wiring diagrams.
      2. Schematic of system components and set up.

PART 2 – PRODUCTS

* 1. Detectors (S&S Middle East RS VRF SERIES)
     1. BACnet MS/TP or Modbus RTU output for BMS integration is required, with readable and writable settings.
     2. Up to 127 units per communication chain.
     3. Appearance: Detector shall be no more than 86mm x 114mm x 25mm and must be designed for use in occupied spaces.
     4. Visual indication: multicolor status LED indication.
     5. Installation: 300mm from the floor.
     6. Dry contact output and 0-10V linear output for additional communication and equipment control as needed.
     7. Maximum system maintenance requirements: the detectors shall require no annual calibration, only an annual span check with a factory supplied gas concentration.
     8. The detector shall utilize a non-dispersive infrared type (NDIR) with a minimum accuracy of +/- 5% FS range below 50% F.S. and +/- 7% of FS range above 50% full scale.
     9. Detectors shall be of the diffusion type.
     10. Power supply: 90-250VAC or 24V.
     11. Factory set high alarm levels to the corresponding ASHRAE OEL value.
     12. Pre-alarm levels shall be factory set to the specifications in this document.
     13. The detectors shall be capable of sensing for the type of refrigerant specified in the equipment and shall come factory calibrated.
     14. Integral audible alarm: 85dB @ 3m.

[Remove tables as necessary. All high alarm levels reflect ASHRAE OEL.]

|  |  |  |  |
| --- | --- | --- | --- |
| **GAS** | **Pre Alarm (PPM)** | **High Alarm (PPM)** | **Mounting Height** |
|  |  |  |  |
| **R-1233zd** | **75** | **1000** | **300mm A.F.F.** |
| **R-1234yf** | **175** | **1000** | **300mm A.F.F.** |
| **R-1234ze** | **175** | **1000** | **300mm A.F.F.** |
| **R-123** |  | **50** | **300mm A.F.F.** |
| **R-125** | **75** | **1000** | **300mm A.F.F.** |
| **R-134a** | **175** | **1000** | **300mm A.F.F.** |
| **R-143a** | **75** | **1000** | **300mm A.F.F.** |
| **R-227ea** | **75** | **1000** | **300mm A.F.F.** |
| **R-22** | **75** | **1000** | **300mm A.F.F.** |
| **R-438a** | **75** | **990** | **300mm A.F.F.** |
| **R-32** | **350** | **1000** | **300mm A.F.F.** |
| **R-404a** | **175** | **1000** | **300mm A.F.F.** |
| **R-407a** | **75** | **1000** | **300mm A.F.F.** |
| **R-407c** | **175** | **1000** | **300mm A.F.F.** |
| **R-407f** | **75** | **1000** | **300mm A.F.F.** |
| **R-410a** | **350** | **1000** | **300mm A.F.F.** |
| **R-417a** | **75** | **1000** | **300mm A.F.F.** |
| **R-422a** | **75** | **1000** | **300mm A.F.F.** |
| **R-427a** | **75** | **1000** | **300mm A.F.F.** |
| **R-434a** | **75** | **1000** | **300mm A.F.F.** |
| **R-448a** | **75** | **860** | **300mm A.F.F.** |
| **R-449a** | **175** | **800** | **300mm A.F.F.** |
| **R-450a** | **75** | **880** | **300mm A.F.F.** |
| **R-452a** | **75** | **790** | **300mm A.F.F.** |
| **R-452b** | **75** | **870** | **300mm A.F.F.** |
| **R-453a** | **75** | **1000** | **300mm A.F.F.** |
| **R-454a** | **75** | **690** | **300mm A.F.F.** |
| **R-454b** | **75** | **850** | **300mm A.F.F.** |
| **R-454c** | **75** | **620** | **300mm A.F.F.** |
| **R-455a** | **75** | **650** | **300mm A.F.F.** |
| **R-507** | **75** | **1000** | **300mm A.F.F.** |
| **R-513a** | **75** | **650** | **300mm A.F.F.** |
| **R-514a** | **75** | **320** | **300mm A.F.F.** |
| **R-442a** | **75** | **1000** | **300mm A.F.F.** |
| **R-422d** | **75** | **1000** | **300mm A.F.F.** |
| **R-424a** | **75** | **990** | **300mm A.F.F.** |

PART 3 – EXECUTION

* 1. INSTALLATION
     1. Comply with ASHRAE 15.
     2. Install hazardous gas monitoring equipment as shown on Contract Drawings, and as recommended by manufacturer of equipment, and as required by authorities having jurisdiction.
     3. All sensors shall be mounting to the proper height in accordance with the manufacturer’s installation instructions.
     4. Verify the refrigerant type being utilized and provide the proper refrigerant sensor from the manufacturer as required.
  2. SEQUENCE OF OPERATION
     1. Immediately upon pre-alarm level detection.
        1. System status and gas concentration to be communication via BACnet MS/TP or Modbus RTU.
        2. The detector LED displays amber.
     2. Immediately upon high alarm level detection.
        1. System status and gas concentrations to be communicated via BACnet MS/TP or Modbus RTU.
        2. The detector LED displays red.
        3. Internal buzzer sounds.