SECTION 23 8500 – VRF REFRIGERANT GAS DETECTION SYSTEM PART 1 - GENERAL

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. 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 (CGS RG SERIES)
     1. BACnet MS/TP 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 4” x 3.5” x 1.5” and must be designed for use in occupied spaces.
     4. Visual indication: multicolor status LED indication.
     5. Installation: 12” 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 @ 10FT.

[Add / remove tables as necessary. All high alarm levels reflect ASHRAE OEL.]

|  |  |  |  |
| --- | --- | --- | --- |
| **GAS** | **Pre Alarm (PPM)** | **High Alarm (PPM)** | **Mounting Height** |
|  |  |  |  |
| **R-1233zd** | **75** | **1000** | **1ft A.F.F.** |
| **R-1234yf** | **175** | **1000** | **1ft A.F.F.** |
| **R-1234ze** | **175** | **1000** | **1ft A.F.F.** |
| **R-123** | **75** | **1000** | **1ft A.F.F.** |
| **R-125** | **75** | **1000** | **1ft A.F.F.** |
| **R-134a** | **175** | **1000** | **1ft A.F.F.** |
| **R-143a** | **75** | **1000** | **1ft A.F.F.** |
| **R-227ea** | **75** | **1000** | **1ft A.F.F.** |
| **R-22** | **75** | **1000** | **1ft A.F.F.** |
| **R-438a** | **75** | **990** | **1ft A.F.F.** |
| **R-32** | **350** | **1000** | **1ft A.F.F.** |
| **R-404a** | **175** | **1000** | **1ft A.F.F.** |
| **R-407a** | **75** | **1000** | **1ft A.F.F.** |
| **R-407c** | **175** | **1000** | **1ft A.F.F.** |
| **R-407f** | **75** | **1000** | **1ft A.F.F.** |
| **R-410a** | **350** | **1000** | **1ft A.F.F.** |
| **R-417a** | **75** | **1000** | **1ft A.F.F.** |
| **R-422a** | **75** | **1000** | **1ft A.F.F.** |
| **R-427a** | **75** | **1000** | **1ft A.F.F.** |
| **R-434a** | **75** | **1000** | **1ft A.F.F.** |
| **R-448a** | **75** | **860** | **1ft A.F.F.** |
| **R-449a** | **175** | **800** | **1ft A.F.F.** |
| **R-450a** | **75** | **880** | **1ft A.F.F.** |
| **R-452a** | **75** | **790** | **1ft A.F.F.** |
| **R-452b** | **75** | **870** | **1ft A.F.F.** |
| **R-453a** | **75** | **1000** | **1ft A.F.F.** |
| **R-454a** | **75** | **690** | **1ft A.F.F.** |
| **R-454b** | **75** | **850** | **1ft A.F.F.** |
| **R-454c** | **75** | **620** | **1ft A.F.F.** |
| **R-455a** | **75** | **650** | **1ft A.F.F.** |
| **R-507** | **75** | **1000** | **1ft A.F.F.** |
| **R-513a** | **75** | **650** | **1ft A.F.F.** |
| **R-514a** | **75** | **320** | **1ft A.F.F.** |
| **R-442a** | **75** | **1000** | **1ft A.F.F.** |
| **R-422d** | **75** | **1000** | **1ft A.F.F.** |
| **R-424a** | **75** | **990** | **1ft 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 vis BACnet MS/TP.
        2. The detector LED displays yellow.
     2. Immediately upon high alarm level detection.
        1. System status and gas concentrations to be communicated via BACnet MS/TP
        2. The detector LED displays red.
        3. Internal buzzer sounds.
  3. COMMISSIONING
     1. After installation, test equipment to demonstrate operation of functions described above under sequence of operation by utilizing sample test gas.
     2. Provide testing kits (including gas bottles) for testing.
  4. WARRANTY.
     1. Limited Warranty
        1. Canadian Gas Safety, Inc warrants to the original purchaser and/or ultimate customer ("Purchaser") of CGS products ("Product") that if any part thereof proves to be defective in material or workmanship within thirty six (36) months, such defective part will be repaired or replaced, free of charge, at CGS' discretion if shipped prepaid to CGS 150 King Street West, Suite 200, Toronto, ON M5H 1J9 in a package equal to or in the original container. The Product will be returned freight prepaid and repaired or replaced if it is determined by CGS that the part failed due to defective materials or workmanship. The repair or replacement of any such defective part shall be CGS' sole and exclusive responsibility and liability under this limited warranty.

END OF SECTION 28 3500