SECTION 23 8500 - GAS DETECTION SYSTEM PART 1 - GENERAL

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| 1.1 |  | RELATED DOCUMENTS |
|  | A. | Drawings and general provisions of the Contract, including General and Supplementary General Conditions and other Division 01 Specification Sections, apply to this Section. |
| 1.2 |  | SUMMARY |
|  | A. | Provide a complete installation of a toxic gas detection system to protect the designated area from harmful gas build up. System to include remote sensors with audible/visual alarm devices to communicate the state of the alarm to the control panel. System to modulate exhaust fans to clear the condition. Control panel to communicate alarm conditions via digital screen and output relays. |
|  | B. | The system shall include, but not be limited to, the following:   1. Future expandability 2. Display of toxic gas concentration 3. Ability to modify alarm set points 4. Automatic fan start/stop in alarm 5. Display of alarm status 6. Re-set and Mute functions |

PART 2 - PRODUCTS

* 1. Control Panel type CGS ParkSafe
     1. The control panel will be 120 Vac powered, individually powering, and accepting the inputs of multiple remote detectors. The unit will clearly display the condition of an alarm and provide a re-set and mute function. The unit shall provide a digital touch screen for menu and set up functions as well as real time detector read out. The unit shall be UL certified and listed to UL61010 standards. Mount the panel at AFF. 48”
     2. The control panel will be capable of effecting on/off, two speed and VFD fan controls via on board relays, for local activation of fans or dampers (or other equipment), the relay will change state in alarm and revert back once the alarm has been removed.
     3. Relays shall be provided for pre-alarm, high alarm and full alarm thresholds. A separate damper relay shall be provided which can be configured on site to actuator at a determined threshold.
     4. The control panel shall be capable of operating within relative humidity ranges of 5-95% non- condensing and temperature ranges of -4° F to 140° F (-20° C to 60° C).
     5. The control panel shall provide 0-10vdc output for variable speed fan drivers.
     6. The unit will accept up to sixteen (16) remote detectors although less may be required for designated detection area.
     7. For local activation of audible alarms, the transmitter shall have an on-board device able to generate an audible output of 85 dBA @ 10 ft.
     8. Unit will be installed as per manufacturer’s instructions and recommendations.
  2. Detectors type

1. Nitrogen Dioxide detectors CGSNO2PS shall be 24 VAC powered by the control panel. Hard wired with 4#18-22AWG cable. The unit will operate in relative humidity of 15 – 90% RH non condensing, in a temperature of 4° to 122° (-20° to 50° C) with a accuracy of +/-5% of full scale and a range of 0-10ppm. The detector will utilize an electrochemical cell diffusion barrier type sensor with an expected life span of 2-3 years. The unit will provide power on indication, alarm indication, and fault indication. Manual calibration of the unit is not necessary. Mount as per manufacturer’s instructions direct to 3/4” conduit or on double electrical rough in box. Dimensions of 5in x 7in approx.

1. Carbon Monoxide detectors CGSCOPS will be 24 VAC powered by the control panel. Hard wired with 4#18-22AWG cable. The unit will operate in relative humidity of 15 – 90% RH non condensing, in a temperature of 4° to 122° (-20° to 50° C) with a accuracy of +/-2% of full scale and a range of 0-10000ppm. The detector will utilize a passive semi conductor diffusion barrier type sensor with an expected life span of 5-7 years. The unit will provide power on indication, alarm indication, and fault indication. Manual calibration of the unit is not necessary. Mount as per manufacturer’s instructions direct to 3/4” conduit or on double electrical rough in box. Dimensions of 5in x 7in approx.

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| GASES | 1st ALARM SET POINT | 2nd ALARM SET POINT | FULL ALARM SETPOINT | MOUNTING HEIGHT | COVERAGE RADIUS |
| Carbon Monoxide  (CO) | 25> 100ppm | 100ppm | 100> 1-5mins selectable | 6 ft above finished  floor | 50 ft |
|  | 1st ALARM  SET POINT  (TLV-TWA) | 2nd ALARM  SET POINT  (TLV-STEL) | 3rd ALARM  SET POINT | MOUNTING HEIGHT | COVERAGE  RADIUS |
| Nitrogen Dioxide (NO2) | 0.72 PPM | 2.0 PPM | 9.0 PPM | 3 ft from ceiling | 50 ft |

Local Building Codes recommendations take precedence over these parameters. Coverage can differ depending on application.

* 1. ACCESSORIES
     1. Strobe and Horn type CGSAAB
        1. Strobe & Horn unit will be capable of operating within relative humidity ranges of 0- 100% and temperature ranges of -30° F to 150° F (-35° C to 66° C). Rating of horn will be no less than 72 dBA at 10 feet. Intensity of light will be no less than 40W and will flash at a frequency of 1 per second. Unit will be certified and listed to ANSI/UL safety standards. Requirements as per drawings.

PART 3 - EXECUTION

* 1. INSTALLATION
     1. Install hazardous gas monitoring equipment including sensors, audible alarms, as shown on Contract Drawings, and as recommended by manufacturer of equipment, and as required by authorities having jurisdiction.
     2. Install conduit and wiring from sensors to control panel and to the fan starters/ HVAC control panel as recommended by manufacturer of equipment.
  2. SEQUENCE OF OPERATION
     1. If any NO2 sensor detects 1 PPM gas, the exhaust fans operate and motorized dampers open. If hazardous gas level reaches 2 PPM, High Alarm fans will be signaled to ramp up on turn on additional fans. Control unit shall provide an audible alarm. If High Alarm condition exists for extended period of time control unit shall go into full alarm sounding beacons and initiating BMS connectivity. Full alarm shall require manual re-set of the equipment.
     2. If any CO sensor detects 25ppm> <100ppm the exhaust fans operate and motorized dampers open. If the CO level reaches 100> High Alarm level the fans will be signaled to ramp up or turn on additional fans. If High Alarm condition exists for extended period of time control unit shall go into full alarm sounding beacons and initiating BMS connectivity. Full alarm shall require manual re-set of the equipment.
     3. If any detector registers a temperature rise above the pre-set alarm threshold the fans shall be signaled to operate and the dampers opened.
  3. COMMISSIONING
     1. After installation, test equipment to demonstrate operation of functions described above under sequence of operation.
     2. Provide testing kits (including gas bottles) for testing and calibration by Commission technician. CGSCOGASKIT CGSNO2GASKIT
  4. WARRANTY.
     1. Limited Warranty
        1. Canadian Gas Safety, LLC. 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 Canadian Gas Safety 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