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 / hazardous gas detection system to protect the designated area from harmful gas build up. System to include stand-alone sensors and audible/visual alarm devices to communicate the state of the alarm condition to BMS or Fan activation systems. |
|  | B. | The system shall include, but not be limited to, the following:   1. Future expandability 2. Gas Valve and Electrical Power Control Circuits 3. Display of Alarm Status 4. Display of Toxic / Hazardous Gas Levels 5. Remote Panic Buttons 6. Relay Outputs to BMS / F.A.C.P. 7. Re-Set and Test Functions |

PART 2 - PRODUCTS

* 1. Gas Detection Device type CGS Mini Merlin CH4CO
     1. The device will be 120 Vac powered, individually powered and capable of accepting the inputs of multiple devices. The unit will clearly display the condition of an alarm and provide hazardous or toxic gas levels via ppm or % of VOL. The device shall provide a re-set and test function. The device shall incorporate dual sensor technology to detect Methane and CO (Carbon Monoxide) without the requirement for additional components. The unit shall be UL certified and listed. Mount the panel per manufacturer’s instructions and recommendations.
     2. The device panel will be capable of transmitting alarm conditions to a BMS system through its dry contact relay output. For local activation of fans or louvers (or other equipment), the relay will change state in alarm and revert back once the alarm has been removed.
     3. The device panel will 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).
     4. The device will be certified and listed to ANSI/UL 61010-1 3rd edition and CAN/CSA-C22.2 No. 61010-1.
     5. The device will energize a 120v output to control gas solenoid valves and electrical contactors. In alarm the device shall de-energize this control output.
     6. 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.
     7. The unit shall provide a traffic signal type colored TFT display, Green – all clear, Yellow – warning (low alarm) Red – Alarm.
     8. Detector alarm levels are to be activated and the unit is to be installed in accordance with the following parameters:

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| GASES | TDLR Code Required Limits | | | MOUNTING HEIGHT | COVERAGE RADIUS |
| Carbon Monoxide  (CO) | 35ppm | 50ppm |  | Per Manufacturer’s Instructions | 50 ft |
|  | 1st ALARM  SET POINT | 2nd ALARM  SET POINT | 3rd ALARM  SET POINT | MOUNTING HEIGHT | COVERAGE  RADIUS |
| Methane | 8% of LEL  4% of VOL | 10% of LEL  5% of VOL |  | Per Manufacturer’s Instructions | 50 ft |

* + 1. The sensors shall be UL listed to comply with UL2075 and incorporate filters to only look for the desired hazardous or toxic gases selected.
    2. Local Building Codes recommendations take precedence over these parameters. Coverage can differ depending on application.
  1. ACCESSORIES
     1. Detector Guards type CGSGUARD. The grid is made of a 9-gauge steel wire. The guard must be

designed to allow calibration without removing the guards.

* + 1. Remote Panic Button type CGSEBSTW Panic Button will be constructed of tough polycarbonate with a stainless steel back plate capable of operating within relative humidity ranges of 0-100% and temperature ranges of -40° F to 250° F (-40° C to 121° C). Unit will be clearly labeled “EMERGENCY BOILER SHUT-OFF” with 5/8” black text on yellow background with red mushroom type button. Unit will be certified and listed to UL safety standards.
    2. Gas Valve type MERLIN\*\*\*\* shall be 120v actuated flanged gas solenoid with an operating pressure 0f 0-5PSI. Constructed of die-cast aluminum with a fluid powered actuator. The valves should be UL listed as a safety shut-off valve with a closing time of <1second.
    3. Electric Contactor type 3RT23171AK60 or equivalent shall be 120V energized electrically held normally open contactor providing 4 Poles (circuits) at 50 AMP at 120v 50/60HZ. Contactor shall be UL listed.

PART 3 - EXECUTION

* 1. INSTALLATION
     1. Install hazardous / toxic gas monitoring equipment including sensors 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 device, gas valve, contactor and remote panic buttons as recommended by manufacturer of equipment.
  2. SEQUENCE OF OPERATION
     1. If Methane Sensor detects 8% of LEL, the detector shall indicate Low Alarm level via TFT screen. If the hazardous gas level reaches 10% of LEL the detector shall indicate High Alarm level via TFT screen and audible alarm. The high alarm shall de-energize the power output to the gas valve and electrical contactor isolating the gas supply to the boiler room and the electrical power to the appliances. The internal relay outputs shall change state communicating the alarm condition to the BMS and F.A.C.P.
     2. If CO sensor detects Carbon Monoxide the detector shall indicate Low Alarm level via TFT screen. If CO levels continue to rise or trigger alarm thresholds as per the OSHA Dept of Labor TWA alarm thresholds the detector shall indicate High Alarm via TFT screen and audible alarm. The high alarm shall de-energize the power output to the gas valve and electrical contactor isolating the gas supply to the boiler room and the electrical power to the appliances. The internal relay outputs shall change state communicating the alarm condition to the BMS and F.A.C.P.
     3. Remote Panic Button and input from fire alarm system shall activate high alarm protocol.
     4. The device shall provide a Re-Set function that will re-energize the gas valve and electrical power outputs allowing the gas supply and the appliances to resume. The Re-Set function shall only be permitted by the device if all detectors are reporting a clean and safe condition.
  3. COMMISSIONING
     1. After installation, test equipment to demonstrate operation of functions described above under sequence of operation by manufactures certified service technician.
     2. Provide testing kits (including gas bottles) for testing and calibration by Commission technician.
  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