SECTION 23 8500 – EMERGENCY GAS SHUTDOWN 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 an emergency boiler room gas shutdown system consisting of an emergency shunt switch located at each exit, normally closed gas solenoid valve, and toxic / hazardous gas detector. The emergency shunt switches shall be wired into the hazardous gas detector through normally closed dry-contact inputs, and the gas solenoid valves shall be powered by the detector via 120VAC valve output. The system is to protect the designated area from harmful gas build up and to provide easy manual emergency shutdown per code. |
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PART 2 - PRODUCTS

* 1. Emergency Shunt Switch Type Canadian Gas Safety model# CGSEGOTW
     1. Labeled “Emergency Gas Off”
     2. Emergency Shunt Switch shall utilize a set of normally closed contacts for control input to gas detector setting it into alarm. When the detector enters alarm, it will in turn de-energize and close the gas solenoid valve.
     3. Clear lift cover to prevent inadvertent shutdowns with a red mushroom twist release button for reset after emergency.
     4. Outdoor weatherproof option CGSEGOTWWM.
  2. Gas Solenoid Valve type CGS Merlin
     1. Provide a Gas Solenoid Valve: UL Listed 429, CSA certified, gas safety shut-off valve. Aluminum body two-way normally closed valve rated for natural gas (methane) and LPG (liquid petroleum gas). Size to be same as pipe size indicated on plans, 120 volt ac single phase actuator, 15 watts, and 2 PSI maximum operating pressure capacity.
     2. Gas solenoid valve shall be placed to shut down the fuel supply to each boiler located inside the room.
     3. Powered by the gas detector via 120VAC de-energizing output.
  3. Gas Detection Device type CGS Mini Merlin CH4CO
     1. The device will be 120 Vac powered, individually powered and capable of accepting the inputs from the emergency shunt switch and de-energizing the gas solenoid valve. The detector shall enter alarm condition when the emergency shunt switch is pressed, or when alarm levels of methane and/or carbon monoxide are present in the boiler room. The device will clearly display the condition of an alarm and provide hazardous or toxic gas levels via ppm or % of LEL. 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 device shall be UL certified and listed. Mount the device 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 to its original state once the alarm has been removed.
     3. The device 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. In alarm the device shall de-energize this control output.
     6. For activation of local audible alarms, the device shall have an on-board siren 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 | 1st ALARM  SET POINT | 2nd 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 |
| CO (Carbon Monoxide) | 35PPM | 50PPM | Per Manufacturer’s Instructions | 50ft |

* + 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.

PART 3 - EXECUTION

* 1. INSTALLATION
     1. Emergency gas shutdown equipment shall be provided by the manufacturer as a complete system.
     2. Install emergency gas shutdown equipment including sensors, emergency shunt switches, and gas solenoid valves as shown on Contract Drawings, and as recommended by manufacturer of equipment, and as required by authorities having jurisdiction.
     3. 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 isolating the gas supply to the boiler room. 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 of 50PPM detector shall indicate High Alarm via TFT screen and audible alarm. The high alarm shall de-energize the power output to the gas valve isolating the gas supply to the boiler room. The internal relay outputs shall change state communicating the alarm condition to the BMS and F.A.C.P.
     3. Remote Panic Button input shall activate high alarm protocol.
     4. The device shall provide a manual 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, 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.

END OF SECTION