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 and combustible 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 Gas Supply and Alarm Status
4. Remote Detectors
5. Remote Audible Alarm Beacons
6. Remote Panic Buttons
7. Relay Outputs
8. Re-Set and Mute Functions
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PART 2 - PRODUCTS

* 1. Gas Detection Panel type AGS GDPX+
		1. The 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 fascia mounted panic button, recessed to avoid accidental shut downs. The unit shall be UL certified and listed. Mount the panel at AFF. 48”
		2. The panel will be capable of transmitting alarm conditions to a BMS system through its Modbus output.
		3. The panel shall provide an ethernet port connection for accessing internet control portal.
		4. For local activation of fans or louvers (or other equipment), a relay will change state in alarm and revert back once the alarm has been manually reset.
		5. The panel shall provide control outputs for remote solenoid valves. The outputs shall be 110v AC 3amp 50HZ and will de-energize in alarm condition.
		6. The control 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).
		7. The unit will be certified and listed to ANSI/UL 61010-1 3rd edition and CAN/CSA-C22.2 No. 61010-1.
		8. The panel will accept up to sixteen (16) remote detectors although less may be required for designated detection area.
		9. The panel shall power and accept the input signal from a pressure transducer. The transducer shall continuously indicate the incoming supply pressure.
		10. For local activation of audible alarms, the panel shall have an on-board device able to generate an audible output of 85 dBA @ 10 ft.
		11. The panel shall provide 24v output signals to activate remote audible alarm beacons with in-built adaptable tones and strobes.

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| GASES | TWA as per Dept of Labor OSHA Guidelines  8hr Avg. Ceiling Limit Instantaneous  (5mins) Limit  | MOUNTING HEIGHT | COVERAGE RADIUS |
| Carbon Monoxide(CO) | 35 PPM | 200 PPM |  500 PPM | 6 ft above finishedfloor | 50 ft |
|  |  1st ALARM SET POINT   |  2nd ALARM SET POINT   |  3rd ALARM  SET POINT | MOUNTING HEIGHT |  COVERAGE  RADIUS |
| Methane | 8% of LEL4% of VOL | 10% of LEL5% of VOL |  |  2ft from ceiling | 50 ft |
| Oxygen Depletion (O2) | 18.5-19.5% | <18.5% & >23% |  | 6ft above finished floor | 50ft |
| Hydrogen (H)  | 8% LEL | 10% LEL |  | 2ft from ceiling | 50ft  |

* + 1. Detector alarm levels are to be activated and the unit is to be installed in accordance with the following parameters:
		2. Local Building Codes recommendations take precedence over these parameters. Coverage can differ depending on application.
	1. ACCESSORIES
		1. Detectors

1. CO, Methane, Hydrogen and Oxygen Depletion detectors shall be mounted on single gang

 rough in box in polycarbonate enclosures allowing access for maintenance and testing.

 Detectors shall provide clear power and alarm condition and current ppm or %LEL via TFT

 digital screen. Detectors shall provide a clear traffic light display changing from green, to

 yellow to red. Red Being full alarm. Detectors shall provide integral test function and come

 factory tested and calibrated.

* + 1. Gas Valves
			1. Provide safety shut off solenoid valves for both Methane and Hydrogen. Valves shall be normally closed 110v UL approved. Furnish valves with capacity and pressure ratings aligned to the gas type and pipe size. See drawings for pipe size and location. Valves shall be interlocked with gas detection panel alarm outputs.

 C. Remote Panic Button type

 1. 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 GAS

 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 and be ADA compliant. Provide

 enough buttons to secure the area, typically one per exit. Provide weather proof cover if

 required.

D. Heat Detector

 1. Provide electrical thermal fuse links above boiler units near to flue. Thermal fuse rated for

72°C (161.6°F) and shall be UL rated. The thermal fuse shall be enclosed in a metal enclosure provided with louvre vents. The thermal fuse shall break a dry contact normally closed alarm circuit.

E. Audible Alarm Beacon

 1. Provide a dual audible and visual alarm beacon constructed of polycarbonate enclosure

 with high intensity LED’s. The alarm shall provide 32 selectable sirens and volume

 options and 8 flash patterns. The beacon shall be powered by the gas detection panel in

 alarm via 24vdc output. Install on signle gang rough in box outside of the protected area.

PART 3 - EXECUTION

3.1 INSTALLATION

A. 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.

B. Install conduit and wiring from sensors to control panel and to the fan starters/ HVAC control panel as recommended by manufacturer of equipment.

3.2 SEQUENCE OF OPERATION

A. If any Sensor reaches Low Alarm level, it’s screen shall turn yellow and the corresponding line on the gas detection panel screen shall show the change of state. If the gas level reaches High Alarm level, it’s screen shall turn red and the detector shall emit an audible alarm. The detector’s alarm level shall signal the gas detection panel to alarm, the main panel shall show High Alarm, indicate which detector and at what alarm level it had alarmed at, the panel shall emit an audible alarm, signal a remote strobe & horn, relay outputs shall change state. The main panel shall de-energize the power outputs to the gas valves isolating the gas supply to the room and to the appliances.

B. The main panel shall provide a Mute function that will disable the audible alarms but will not interfere with the BMS or F.A.C.P. outputs or re-energize the gas valve and electrical power outputs.

C. The gas detection panel shall provide a manual Re-Set function that will re-energize the gas valves allowing the gas supply to resume. The Re-Set function shall only be permitted by the gas detection panel if all detectors are reporting a clean and safe condition.

3.3 COMMISSIONING

A. After installation, test equipment to demonstrate operation of functions described above under sequence of operation by manufactures certified service technician.

B. Provide testing kits (including gas bottles) for testing and calibration by Commission technician.

3.4 WARRANTY.

A. Limited Warranty

American Gas Safety, LLC. warrants to the original purchaser and/or ultimate customer ("Purchaser") of AGS 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 AGS' discretion if shipped prepaid to AGS 4500 140th Ave N. Suite 114, Clearwater, FL 33762, 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 AGS that the part failed due to defective materials or workmanship. The repair or replacement of any such defective part shall be AGS' sole and exclusive responsibility and liability under this limited warranty.

END OF SECTION 28 3500