- SECTION 15XXX

CARBON MONOXIDE/COMBUSTIBLE GAS DETECTION AND ALARM SYSTEMS

Boiler rooms, Gas meter rooms
(State, local and municipal codes shall govern)

PART 1 – GENERAL

1.1 SUMMARY

A. The gas detection system(s) shall be as indicated on the project documents, point list, drawings and as described in these specifications. This scope of work shall include a complete and working system including all engineering, programming, controls, and installation materials, commissioning, start-up, training, and final project documentation and warranty.

2.0 PRODUCTS

2.01 VA301C Controller

A. The control panel must be capable of communicating digitally with the networked transmitters and relay modules through three RS-485 Modbus communication buses. Each communication bus must be capable of accepting a combination of up to 32 addressable transmitters, relay modules, or annunciator panels at a maximum distance of 2,000 feet (609 m).

B. The control panel will manage four internal DPDT relays at fully programmable alarm levels (and within programmable time delays). The relay rating will be not less than 5 A, 30 Vdc or 250 Vac (resistive load).

C. The control panel must include a (operator initiated) self-test function that allows for the activation/deactivation of all the programmed outputs by simulating a continuous 5% increase/decrease value until the maximum/minimum value is reached.

D. The control panel must include a real-time clock that enables operation of the outputs for a specific time frame.

E. The control panel must also include a Honeywell energy saving feature that allows for output operation on alarms set at the max, min, or average value of a specific group of transmitters. This feature must also allow for the activation of outputs upon a certain number of a specific group (¾, ½, ⅓ and ¼) of transmitters reaching their alarm levels. 128 groups can be assigned.

F. The control panel will indicate the exact concentration of gas, the gas detected, and the location of the sensor by scanning through the network and displaying the detected levels at each point on an LCD display.

G. The LCD display will indicate multiple alarm levels for each sensing point. The LED will also provide visual feedback in the following manner:

Normal Operation:	Green LED
Alarm Level A:	Red LED
Alarm Level B:	Red LED
Alarm Level C:	Red LED
Failure:	Yellow LED
TX:	Yellow LED
RX:	Green LED

H. The standard three high/low alarm levels will be complemented with multiple levels that can be field programmed.

I. The panel will have an audible alarm incorporated (rated at not less than 65 dBA at three feet), which will be activated at fully programmable levels.

J. The control panel will leave the factory fully programmed and will be adjustable in the field by keying in instructions via the keypad (password protected). Programming may be saved on an optional SD Flash memory card.

K. The control panel shall enable BACnet communication through its BACnet output using BACnet/IP protocol over twisted-pair Ethernet (10 BaseT) cable RJ45.

L The unit will be certified to UL and CSA standards. The controller must be manufactured within an ISO 9001 production environment. The sensors and controller must be FCC certified

2.02

VA201T Transmitter

VA201TQ1CO-NET CO Transmitter
VA201TQ1COMB-NET Methane (CH4) Transmitter

A. The transmitter will be powered by the control panel's power output rated at 24 Vac / 24 Vdc or by an external power supply rated at 24 Vac or 24 Vdc.

B. Fully addressable, the gas transmitter must be capable of communicating digitally with the control panel through an RS-485 communication port. The gas transmitters must be installed in a true daisy chain network with an end of line resistor on the last transmitter.

C. The gas transmitter will incorporate an electrochemical cell. The unit's sensing cell must compensate for variations in relative humidity and temperature to maintain high levels of accuracy.

D. Placed into a network configuration, the transmitter will be capable of transmitting gas concentrations through the control panel. For local activation of fans or louvers (or other equipment) an optional DPDT relay 5A, 30 Vdc or 250 Vac (resistive load) will be activated at programmable set points (and programmable time delays) through the control panel, if necessary. The transmitter will also have the capability of sending an analog 4-20mA signal to the BMS/DDC as an option.

E. A 10-step LED display (with an optional LCD display) will provide gas concentration readings. A green LED will indicate normal operation and a yellow LED will indicate fault operation.

F. The transmitter must also be capable of incorporating an audible alarm (rated at no less than 65Db at a distance of three feet), which will be activated at fully programmable levels through the VA301C control panel.

G. The transmitter will be capable of operating within relative humidity ranges of 15-95% (non- condensable) and temperature ranges of -4^{O}F to 122^{O}F (-20^{O}C to +50^{O}C)

H. The unit will be manufactured to ANSI/UL 61010-1 label and CSA 22.2. The transmitter must be manufactured within an ISO 9001-2000 production environment.

I. Transmitter alarm levels are to activate and the unit is to be installed in accordance with the following parameters:

TOXIC GASES	FIRST ALARM SET POINT (TLV-TWA)	SECOND ALARM SET POINT (TLV-STEL)	SENSOR LOCATION	RADIUS OF COVERAGE
Carbon Monoxide (CO)	25 PPM	200 PPM	3-5 ft (1-1.5 meters) AFF	50 feet (15 meters)
Nitrogen Dioxide (NO_2)	0.72 PPM	2 PPM	1 ft (0.350 meters) BFC	20 feet (6 meters)

COMBUSTIBLE GASES	FIRST ALARM SET POINT (25 % LEL)	SECOND ALARM SET POINT (50 % LEL)	SENSOR LOCATION	RADIUS OF COVERAGE
Methane (CH4)	25 % LEL	50 % LEL	1 ft (0.350 meters) BFC	20 feet (6 meters)

PART 3 EXECUTION

3.01 CARBON MONOXIDE DETECTION SYSTEM

A. Carbon monoxide and combustible gas detection system shall include maintenance-free, Electrochemical, detectors located strategically throughout the structure. Each detector shall cover a maximum area of 1,300 sq feet (120 sq meters).

B. The carbon monoxide and combustible gas detection and fan control system shall be provided to monitor the levels in the structure and control the exhaust and supply fans.

3.02 INSTALLATION

The system shall be installed with strict adherence to the manufacturer's guide lines.

A. Mount carbon monoxide sensors where indicated on Drawings, 3-5 feet (1-1.5 meters) above finished floor.

B. Mount methane sensors where indicated on Drawings, 2 feet (1 meters) below finished ceiling.

C. Fans and motors are specified in other sections.

D. Install low-voltage conduit and wire for fan activation.

E. Line voltage conduit and wire are specified in Division 16: Electrical.

3.03 SEQUENCE OF OPERATION

A. Normal Mode: The exhaust fans shall be controlled by the carbon monoxide combustible gas detection system. At 25 ppm, fans will operate until the carbon monoxide levels drop below 20 ppm. At 25 % LEL fans will operate until the methane level drops below 20% LEL. An alarm will be given in the event carbon monoxide concentrations exceed 200 ppm, and or methane concentrations exceed 50 % LEL.

3.03 START-UP TESTING

A. Manufacturer or manufacturer's representative shall review and test the system after it is complete and operating and shall submit a test report to the Architect.

B. Submit six (6) copies of operations and maintenance manuals. Manuals shall be bound with index, tabs, and include the following:

1. Equipment submittals.
2. Operating and maintenance instruction sheets and parts list.
3. Design Data sheets.
4. Contact person for more information.

3.05 CLEANUP

A. Remove rubbish, debris, and waste materials and legally dispose of off the Project site.

3.06 PROTECTION

A. Protect the Work of this section until Substantial Completion.

3.07 **WARRANTY**

A. Limited Warranty
Honeywell Analytics, Inc. warrants to the original purchaser and/or ultimate customer ("Purchaser") of Vulcain products ("Product") that if any part thereof proves to be defective in material or workmanship within twelve (12) months, such defective part will be repaired or replaced, free of charge, at Honeywell Analytics' discretion if shipped prepaid to Honeywell Analytics at 4005 Matte Blvd., Unit G, Brossard, Quebec, Canada, J4Y 2P4, 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 Honeywell Analytics that the part failed due to defective materials or workmanship. The repair or replacement of any such defective part shall be Honeywell Analytics' sole and exclusive Responsibility and liability under this limited warranty.

END OF SECTION