SECTION 15xxx

PARKING GARAGES GAS DETECTION SYSTEM
(Applicable for Maintenance Garages, Fire Stations, Loading Docks, and Ambulance Bays, according to Local Building Codes).

1.0 GENERAL

1) Provide a complete installation of a toxic gas detection system including a main control panel, sensors and audible/visual alarm devices that can be linked to a Controller or a Building Automation System (BAS).

2) 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 and manual fan start/stop
    6. Display of alarm status

2.0 PRODUCTS

2.01 CONTROLLER VA301C

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. The power supply shall be of either 17-27 Vac or 24-38 Vdc

B. The controller will manage four internal DPDT relays at fully programmable alarm levels (and within programmable time delays) and be capable of activating multiple relay modules of eight relays each. The relay rating will be no lower than 5 A, 30 Vdc or 250Vac (resistive load).

C. The controller must include a 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 controller must include a real-time clock that enables operation of the outputs for a specific timeframe.

E. The controller must also include an 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. A total of 128 groups can be assigned.

F The controller will be capable of communicating with an annunciator panel that can serve as a remote display panel in a secondary control room.

G. The controller will indicate the exact concentration of gas, the gas detected, and the location of the sensor by sweeping through the network and displaying the detected levels at each point on a graphic LCD display.

H. BACnet option if required:
The controller must enable BACnet™ communication through its optional BACnet output using BACnet/IP protocol over twisted-pair Ethernet (10BaseT) wires.

I. Data logging option if required:
An optional data logging capability must provide long-term data logging to determine trends. The controller must collect data automatically and must store it on a digital Flash media card.

2.02 DETECTORS VA201TQ2CO & VA201TQ1NO2

A. Transmitter will be powered by the control panels power output rated at 17-27 Vac. Fully addressable gas transmitter must be capable of communicating digitally with controller through an RS-485 communication port. Gas transmitters must be installed in a true daisy chain with an end of the line resistor on the last transmitter. The gas transmitter will incorporate an electrochemical cell for toxic gas monitoring. Unit sensing cell must compensate for variations in relative humidity and temperature to maintain high levels of accuracy.

B. When placed in a network configuration the transmitter will be capable of transmitting gas concentrations through the controller. 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. A 10-step LED display (with an optional LCD display) will provide gas concentration readings. Normal operation will be indicated by a green LED; fault operation will be indicted by a yellow LED.

C. Transmitter will be capable of operating within relative humidity ranges of 5-95% and temperature ranges of -4º F to 104º F (-20º C to 40º C).

D. Unit will be manufactured to ANSI/UL 61010-1 label and CSA 22.2. Transmitter must be manufactured within an ISO 9002 production environment.

Detector alarm levels are to be activated and the unit is to be installed in accordance with the following parameters:

TOXIC GASES	**1st ALARM SET POINT (TLV-TWA)**	**2nd ALARM SET POINT (TLV-STEL)**	**3rd ALARM SET POINT**	**MOUNTING HEIGTH**	**COVERAGE**
Carbon Monoxide (CO)	25 ppm	200 ppm	225 ppm	5 ft (150 cm)above finished floor	50 ft (15 m)
Nitrogen Dioxide (NO2)	0.72 ppm	2.0 ppm	9.0 ppm	1 ft (30 cm) from ceiling	23 ft (7 m)

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

2.03 ACCESSORIES

A. Strobe and Horn STASR24VAC

Strobe & Horn combo unit will be capable of operating within relative humidity ranges of 0-100% and temperature ranges of -30 degrees F to 150 degrees F (-35C to 66C). Rating of horn will be no less than 72dB 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 by CSA. Honeywell Analytics (Vulcain).

B. Power Transformers T100VA

A. Transformer shall have an input voltage of 120 and an output voltage of 24 with a VA range of 50-5000. Operating frequency shall be 60 Hz. Unit will provide insulation systems up to 130° C (50-1000 VA). Unit will operate at sound levels of less than 40 db. Transformers shall be of fused type.

C. Relay Modules VA301R8

A. Relay module will be powered by the control panel's power output or by power transformer rated at 24 Volts AC or DC (always respect minimum voltage requirements at device). Module must be capable of communicating digitally with the Vulcain controller through an RS-485/MODBUS communication port. Relay module will have eight relays rated at no lower than 5A, 30 Vdc or 250 Vac (resistive load). Honeywell Analytics (Vulcain) model VA301R8

D. Detector Guards TM GUARD

A. The grid is made of a 9-gauge steel wire coated with corrosion resistant black paint. The guard must be designed to allow calibration and replacement of sensor without removing the guards.

3.00 EXECUTION

3.01 INSTALLATION

A. Disconnect existing carbon monoxide detection system including sensors, control panel, conduit and wiring. Discard conduit and wiring removed, hand over sensors and control panel to the Owner.

B. Install hazardous gas monitoring equipment including sensors, audible alarms, panels as shown on Contract Drawings, and as recommended by manufacturer of equipment, and as required by authorities having jurisdiction.

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

3.02 SEQUENCE OF OPERATION

A. If any of the NO2 sensors detects .72 PPM gas, the exhaust fans operate and motorized dampers open. Low Alarm indicators light for point in alarm. If hazardous gas not cleared after 30 minutes or you reach 2 PPM, High Alarm indicator lights on the main panel and remote strobe & horn combos to activate, Audible Alarm to sound and contacts to operate the exhaust fans.

B. If any of the CO sensors detects 25 PPM gas, all fans operate and damper opens. Low Alarm LED lights for point in alarm. If any sensor detects 200 ppm gas, the Audible Alarm sounds and High Alarm indicator lights on the main panel and remote strobe & horn combos to activate.

3.03 COMMISSIONING

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

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

C. Include a two year all inclusive service contract including parts, labor and travel with two calibrations per year by manufacturer's certified service centre.

3.04 WARANTY.

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