

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 301C-DLC-W (Wireless)

A. The control panel must be capable of wireless communication with the networked transmitter and relay modules through a 2.4 GHz RF module. The control panel shall be able to communicate with and monitor up to 60 addressable transmitters, relay modules or annunciator panels. The control panel shall be powered either by 24 Vac or 24 Vdc (always respect minimum voltage requirements at device). The wireless transmitters shall be powered by their own internal battery.

B. The controller wireless communication module must communicate with the network of wireless transmitters using the ISM 2.4GHz frequency band. The controller wireless communication module shall be capable of accepting up to 60 transmitters, including wireless relay modules.

C. The wireless communication system shall be able to use the MESH Network technology; if one communication link fails, the data is automatically rerouted through another monitor (transmitter) to ensure continuous communication. The controller shall transmit periodic RF signals to ensure that the transmitters are continually active.

D. The control panel 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 250 Vac resistive load.

E. The control panel 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.

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

G. The control panel 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 allow for the activation of outputs upon certain number of a specific group (3/4, 1/2, 1/3, and 1/4) of transmitters reaching their alarm levels. A total of 128 groups can be assigned.

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

I. The control panel 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.

J. The data logging capability must provide long-term data logging to determine trends. The control panel must collect data automatically and must store it on a digital Flash media card.

K. The control panel shall be able to incorporate a BACnet output for interfacing with the building automation system using a BACnet/IP protocol over Category 5 Ethernet wires. This is an option that does not come on the standard controller and must be ordered.

2.02 WIRELESS DETECTORS 301WCO & 301WNO2

A. The wall mounted wireless transmitter shall be able to communicate with the controller using a 2.4 GHz ISM frequency band with an indoor range of 30 meters. The transmitter shall incorporate an electrochemical sensor calibrated to one of the following gases; Carbon Monoxide with an accuracy of +/- 10 ppm, Nitrogen Dioxide with an accuracy of +/- 0.2ppm or Oxygen with an accuracy of 0.2%. The transmitter must identify a low battery with a blinking amber LED. The transmitter must report a depleted battery back to the controller. The controller will display the transmitter address and illuminate a yellow Fault LED.

B. The transmitter is powered by one 3.6 V, 19 AH battery. The transmitter's sensor and battery cartridge shall be field replaceable and maintenance free, with a life span designed to operate no less than two years. The transmitter is designed to operate within the 15 to 95% rH range and -20°C to 50°C (-4°F to 122°F). The sensor unit will be compliant to CSA 61010-1 as manufactured by Honeywell Analytics.

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 HEIGHT | COVERAGE |
|-------------------------------------|--------------------------------------|---------------------------------------|---------------------------------------|------------------------------------|-----------------|
| Carbon Monoxide (CO) | 25 ppm | 200 ppm | 225 ppm | 5 ft (150 cm) above finished floor | 50 ft (15 m) |
| Nitrogen Dioxide (NO ₂) | 0.72 ppm | 2.0 ppm | 9.0 ppm | 1 ft (30 cm) from ceiling | 23 ft (7 m) |
| | | | | | |

**Local Building Codes recommendations have preference 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°F to 150°F (-35°C to 66°C). Rating of horn will be no less than 72dB at 10 feet. Intensity of light will be no less than 40W and have a rate of 1 flash per second. Unit will be certified by CSA and supplied by Honeywell Analytics (Vulcain).

B. Power Transformers T100VA

A. Transformer shall have an input voltage of 120 Vac and an output voltage of 24 Vdc with a range of 50-5000 VA. 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. Wireless Relay Modules 301R8-W-F

A. The Wireless Relay module will be powered by the control panel's power output or by a power transformer rated at 24 Vac or 24 Vdc (always respect minimum voltage requirements at device). Module must be capable of communicating with the controller through the network of wireless transmitters using the ISM 2.4GHz frequency band communication port. The Wireless Relay module will have eight relays rated at no lower than 5A, 30 Vdc or 250 Vac (resistive load) and shall be manufactured by Honeywell Analytics (Vulcain).

D. Detector Guards 301W-CAGE

A. The grid is made of a 9-gauge steel wire coated with corrosion resistant white polyester.

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 0.70 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 center.

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 manufactures certified service center.

3.04 WARRANTY.

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, J4Y2P4, 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