

# Part 1 General

Scope of Work:

Provide all labor, materials, products, equipment and service to supply and install a Carbon Monoxide / Nitrogen Dioxide detection and control system indicated on the drawing and specified in this section.

Reference standards:

Units shall be UL listed.

# Part 2 Products

Provide MSA model Z Gard CX Controller

Provide MSA Z Gard DS NO2 and CO Sensor

## Control panel

Provide MSA model Z Gard CX Controller

Meet the following requirements:

Control panel must be capable of communicating digitally through RS-485 communication bus networked transmitters. Communication bus must be capable of accepting up to 40 addressable transmitters. Controller will include one power supply and be sufficient to power the entire gas detection network.

Control panel will activate internal SPDT relays at fully programmable alarm levels (and within programmable time delays. Contacts shall be rated for 10 Amps 1/8 HP @ 125 VAC, 5 amps resistive at 250 VAC or 30VDC. Control panel relays are "pilot duty" and are not rated as fan starter. Fan starter (as required) to be supplied separate from gas detection equipment.

The control panel will indicate the exact concentration of gas, the gas detected and the sensor on an LED display. LED will also provide visual feedback in the following manner:

Normal operation:	Green LED
Warning:	Yellow LED
Alarm:	Red LED
Sensor Failure:	Red LED

Panel will have an incorporated audible alarm, rated at no less than 93 dBA at .3 meters, that will be activate at fully programmable levels.

Control panel will leave the factory fully programmed.

Continuous self diagnostics will verify the reading of each transmitter for abnormal sensing behavior, loss of communication with the transmitters and program corruption analysis.

## Gas Sensors

Provide MSA Z Gard DS NO2 and CO Sensor

Meet the following requirements:

1 – 40 Sensors will be powered by the control panel. Systems with > 40 sensors require additional/external power supply. Fully addressable gas sensor must be capable of communicating digitally with control panel through an RS-485 communication port. Gas sensors must be installed in a true daisy chain. Gas sensor will provide optional 4-20mA output.

The gas monitor 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. There will be a separate sensor for each gas required.

CMOS or Solid State sensing technology will not be accepted.

Sensor will be capable of operating within relative humidity ranges of 15-95% and temperature ranges of 32° F to 104° F (0° C to 40° C).

Sensors will be housed in NEMA 4x enclosure.

Unit will be manufactured to UL and CSA levels.

Sensor alarm levels to activate and unit to be installed to the following parameters :

<b>TOXIC GASES</b>	<b>FIRST ALARM SETPOINT (TLV-TWA)</b>	<b>SECOND ALARM SETPOINT (TLV-STEL)</b>	<b>SENSOR LOCATION</b>	<b>RADIUS OF COVERAGE</b>
<b>Carbon Monoxide (CO)</b>	<b>25 ppm</b>	<b>200 ppm</b>	<b>3-5 ft above the floor</b>	<b>50 feet</b>
<b>Nitrogen Dioxide (NO2)</b>	<b>1 ppm</b>	<b>2 ppm</b>	<b>3-5 ft above the floor or 1-3 ft below the ceiling</b>	<b>50 feet</b>

## Strobe Horn

Meet the following requirements:

Strobe horn will be activated by the relay number 2 of the Control panel or the Annunciator panel.

Power requirement will be 120 V AC 60/60 Hz 0.35 Amps. Unit will be capable of being mounted directly onto conduit or onto a 4 inch junction box.

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 will flash at a frequency of 1 per second.

Unit will be certified by CSA.

## Part 3 Activation Sequence

Set up the following operation mode:

- A. Activate one exhaust fan and one make-upper zone when concentration reaches 25% of LEL/Alarm Level A as indicated in the above table. Fans to be activated through relays on the VA-201C Controller.
- B. Activate audible and visual alarms (located on the controller and/or the external strobe horn when concentration reaches 50% LEL/Alarm Level B as indicated in the above table