

Part 1 General

Scope of Work:

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

Reference standards:

Units shall be certified to UL and CSA requirements. Manufacturer to be ISO 9002 accredited.

Part 2 Products

Provide MSA Ultima XA

Sensor/Transmitter Remote Sensor Mounting

The sensor portion of the sensor/transmitter unit will be remotely, inside the battery charging area, mounted from the electronics and display. The separate display/alarm enclosure will be mounted (up to one hundred (100) feet from the main enclosure) outside the battery charging area within 3 feet of main entrance to space.

Sensor/Transmitter Operating Requirements

Operating Voltage - The sensor/transmitter can operate between 7-30 VDC.

Sensor/transmitter electronics shall consist of one PCB. This PCB shall offer expandability to allow for optional LED's and relays.

Sensor/transmitter shall require the following wiring configurations:

3-wire cable for all combustible units (configured with or without LED or relay options).

Set-up and start-up of the sensor/transmitter will be so that the enclosure need not be opened during this process.

Sensor/transmitter shall be factory calibrated, ready for use out of the box. A gas check is all that is required to ensure proper operation.

Sensor/transmitter shall contain no pots, jumpers or switches.

Sensor/transmitter output signal shall be 4 to 20mA. The combustible sensor/transmitter will be a sourcing type of signal capable of operating into a 600-ohm load.

Sensor/Transmitter Display

There will be a local display indicating the gas type being monitored and the concentration of gas present. The display will alternate between the gas type (1 second) and gas concentration (5 seconds). The display will be an integral part of the sensor/transmitter enclosure. The display will be visible from a minimum of 5 feet and will be present always, and will not require being turned on or off. This readout will be three, one half-inch (3 1/2") digit Liquid Crystal Displays (LCD).

Sensor/transmitter display shall indicate all diagnostic check/fault conditions with a scrolling message detailing the condition. Error codes shall not be used.

Sensor/transmitter will display 3 levels of alarm. Alarm levels will be adjustable by means of a hand held infrared controller.

Smart Sensor Technology

Sensors shall be contained in sensor modules mounted external to the main enclosure. All sensor modules shall have the capability of replacement while the unit is under power (hazardous areas) without the need for tools.

Sensor modules shall contain all relevant sensor information within the module. This information shall include sensor manufacturer date, gas type, gas range, calibration data, and default relay parameters.

Sensor module shall store all calibration data so that the module may be calibrated off site and installed in the field without the necessity of re-calibration. The sensor module shall not require a battery or power source to store this data.

LED / Relay Options

Sensor/transmitter shall have optional LED's, viewable from 50 feet, minimum. The LED's shall operate as follows:

Solid green LED – normal operation (measure mode)

Solid red LED – fault condition

Blinking red LED – alarm condition

Sensor/transmitter shall have optional relays. Relays shall be rated at 5 amps @ 30VDC, 5 amps @ 220VAC, single-pole, double-throw and consist of three for alarm levels and one for fault. All relay contact activation will be monitored. If the relay cannot activate for any reason, the trouble relay will change state. All relays shall be field selectable through a non-intrusive hand-held wireless remote control unit (Controller). Selectable features include:

Alarm level

Latching / Non-latching

Upscale / Downscale

Normally-opened / Normally-closed

Energized / De-energized

Other Features

Sensor/transmitter will be capable of storing and displaying average, minimum and maximum gas concentrations over selected periods of time.

The sensor/transmitter will give an indication of when sensor is nearing the end of its useful life by means of the front panel LCD. This indication that the sensor is nearing its useful life will be based on the sensor output. It shall not be based on the time the sensor was in service.

The sensor/transmitter units can be located remote from a monitor/readout unit by up to 4000 feet via properly gauge wire.

Sensing Element Warranty

All sensing elements (sensors) will have a minimum useful life of one year. The supplier will provide replacement sensors at no charge for any sensor that does not meet the minimum requirement.

Sensor Enclosure Parameters

Sensor/transmitter will be a plastic enclosure designed to meet Nema 4X requirements unless space requires “Explosion Proof” enclosures (see Ultima XE)

Sensor will be capable of operating within relative humidity ranges of 5-90% and temperature ranges of 32° F to 100° F (0° C to 40° C). Sensor must also have optional capacity of operating within a -40° F to 140° F* (-40° C to 50° C) temperature range.

Unit will be manufactured to UL 1244 label and CSA 22.2. Controller must be manufactured within an ISO 9002 production environment.

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

COMBUSTIBLE GASES	FIRST ALARM SETPOINT (25% LEL)	SECOND ALARM SETPOINT (50% LEL)	SENSOR LOCATION	RADIUS OF COVERAGE
Hydrogen (H2)	1%	2%	1 ft below the ceiling	20 feet

Strobe Horn

Meet the following requirements:

Strobe horn will be activated by a relay within the gas sensor transmitter as indicated above. 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 TLV-TWA/Alarm Level A as indicated in the above table. Fans to be activated through relays on the VA-201C controller or VA-201R relay module or VA-SQN-A annunciator
- B. Activate audible and visual alarms (located on the VA-201C controller, VA-SQN-A Annunciator panel and the external strobe horn when concentration reaches TLV-STEL/Alarm Level B as indicated in the above table