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TYPICAL SPECIFICATIONS FOR ACME CEW4 QUADSET WIRELESS MULTIPOINT, MULTIGAS DETECTION AND CONTROL SYSTEMS

Engineering Specifications For:

Parking Garages / Maintenance Garages /Fire Stations / Loading Docks / Ambulance Bays

CATEGORY 1 -

Suitable for small to medium size applications where the ventilation system will be controlled by the Acme Quadset Wireless Gas Detection System (stand-alone system complete with controller and remote sensor).
For up to 4 sensors/transmitters.

1.0 Supply and install as shown on drawings an ACME QuadSet "CEW4" Series Wireless Multipoint & Multigas Centralized Detection and Control System consisting of the following:

A quantity of __ Control Panels and a quantity of ___ GasPost WS CO Sensor/Transmitters and a quantity of ___ GasPost WS NO2 Sensor/Transmitters (maximum of 4 Sensor/Transmitters per panel).

Note : Panels and Remote Sensor/Transmitter stations shall be by the same manufacturer.

DESCRIPTION

1.1 The system shall use an addressable wireless network protocol. Each sensor shall be sequentially polled by the Control Panel. Sensor data shall be acquired and stored in the Control Panel memory.

1.2 The ACME QuadSet CEW4 Series Multipoint System shall use a common 900MHz or 2.4GHZ radio communication link between the Control Panel and the local sensor stations. The RF modules shall be FCC/IC/ETSI/CE compliant. The RF modules shall have 7-Frequency Hopping Channels for reliable interference-free transmissions.

1.3 The Control Panel shall have an LED display with an indicating light for each sensor location. This light shall blink slowly for low-level indication, blink quickly for high-level indication and be solid ON for alarm level indication. A liquid-crystal alphanumeric 4-line display shall provide PPM levels for each sensor station, shall indicate the type of gas being monitored at that location and its alarm status.

1.4 The Control Panel shall have a removable keypad for programming purposes and the programming shall be password protected. Systems with panel-mounted keypads are not acceptable.

1.5 With the exception of the antenna, the Control Panel shall have all of its components, including the controller, RF module, power transformer and relay outputs boards in a single enclosure. The antenna shall be external to the control panel and shall be positioned for optimum RF reception. Multiple enclosures requiring inter-wiring are not acceptable.

1.6 The Control Panel's sequence of operation and other parameters such as set-points, time delays, hysteresis, etc. shall be programmed at the factory so that the gas detection network is "plug-and-play". It shall be possible to revise the programming of the controller in the field in the event of upgrades and other modifications.

1.7 Control Panel shall be supplied with a remote high gain antenna via. The connection between the remote antenna and the control panel shall be via a 4-wire RS485 connection.

1.8 The equipment shall be CSA (Canada/USA) certified. Equipment shall be manufactured within
ISO 9001 manufacturing environment.

2.0 OUTPUTS

2.1 "ON - OFF"

The Control Panel shall incorporate the necessary logic circuits to operate the exhaust/supply fans and the motorized dampers for fresh air and/or exhaust according to the specified logic of ventilation. Should the equipment operated by the 100 PPM CO contacts not reduce the CO level below this value within 30 minutes (3 to 60 minutes adjustable), and/or should a 3PPM NO2 concentration be reached at any NO2 sensor, the Control Panel shall go on visual and audible alarm (rating of no less than 65 dB at a distance of 3 feet) and also provide a contact for remote alarm indication or supervision. Control Panel shall be capable of incorporating common alarm relays and relays dedicated to each sensor. Relay rating shall be no less than 3A at 120V.

Control Panel shall provide a 4-20 ma or 0-10V DC analog output signal based on the highest condition or on the average of conditions detected on a per zone basis.

2.2 CONSTRUCTION

The QuadSet CEW4 Control Panel shall be of solid ventilated 16 gauge steel construction. All electronic components shall be behind a locked door. There shall be no accessible switches or knobs on front of panel (except for override if specified). All electrical connections should be made to clearly identified terminals.

2.3 SELF-CHECKING

Integrity of the system shall be under constant supervision. Should a remote sensor station fail to communicate, a fault condition (RF DOWN) for that channel shall be displayed at the Control Panel. A common alarm shall be locked in.

2.4 TIME DELAY (APPLICABLE TO CO SENSORS ONLY)

The Control Panel shall include a time delay of approximately 30 minutes scheduled between the time a High Level is detected and the time visual display on unit cover or panel, audible alarm and closure of alarm contacts. This time delay is introduced in order to avoid nuisance alarms produced by short temporary conditions. The time delay also allows the ventilation equipment, previously started at a lower gas level below alarm conditions, a reasonable length of time to reverse the gas trend.

3.0 SENSOR STATIONS

3.1 The Wireless WS series remote sensor stations shall be in wall or column mounted PVC gasketed enclosure with vandal-proof cover screws or a lockable clasp and shall not have any parts accessible from outside. The RF antennas shall be concealed in the enclosure.

3.2 The local reaction time of the sensors shall be in the order of a few seconds therefore avoiding all potential hazardous situations by immediately activating the ventilation equipment.

3.3 The WS sensor stations shall be powered from Acme's own specially designed battery units. Battery units shall be built-in to the sensor enclosure, be maintenance free and have a useful life of 2 years. No substitute batteries are acceptable.

3.4 Optionally, in cases where there is a 24V AC supply source available at the location, the sensor stations shall have the option to be ordered as "hardwired", i.e. without the need of batteries.

3.5 Removing or disconnecting a local sensor station in the wireless network shall not affect the operation of the system.

3.6 There shall be no maintenance required except for yearly simple calibration checks performed by introducing a known gas mixture into the sensor and verifying or adjusting the electronic response at the sensor location.

3.7 CO and NO2 sensors shall be of electrochemical type. CO sensors shall have a useful life of no less than 5 years. NO2 sensors shall have a useful life of no less than 2 years. Sensors and battery units shall be replaced at the same time every two years. Sensing elements shall be gas specific, temperature and humidity compensated and with an accuracy of no less than 3% of the reading.

3.8 Sensing elements that are compound generic and lack temperature and humidity compensation that are prone to false positives creating false alarms and require more than a calibration a year are not acceptable.

4.0 INSTALLATION

4.1 Mounting Heights

For CO (Standard Gasoline Fumes): remote sensor stations must be mounted vertically according to the arrow on the sensor. Heights between 4 ft. (1.20 m) to 6 ft.(1.80 m) are typical. Locations where a parked vehicle may exhaust directly into the sensor should be avoided. Where sensors are mounted on columns, the preferred side should be outside the usual lane of traffic.

For NO2 (Diesel Fumes), Methane, and Hydrogen: remote sensor stations must be mounted vertically according to the arrow on the sensor. Installation heights between 12" (300 mm) to 18"" (450 mm) below the ceiling are typical.

Refer to table for the determination of quantities and alarm settings:

TOXIC GASES	FIRST ALARM SET POINT (TLV-TWA)	SECOND ALARM SET POINT (TLV-STEL)	RADIUS OF COVERAGE
Carbon Monoxide (CO)	25 PPM	100PPM	50 feet
Diesel (NO_2)	1 PPM	3 PPM	50 feet

4.2 The QuadSet CEW4.
Control Panel shall be energized at all times. Supply 120/1/60 - 15A from dedicated circuit. It should be impossible to disconnect power to a MultiSet system in order to service other equipment.

4.3 All equipment shall be interconnected at the factory and shipped factory calibrated after a 7-day operational test. The logic of the system shall be factory tested by simulated field conditions as specified. A report shall be furnished with the equipment.

4.4 All electrical connections shall be made by the electrical contractor according to diagrams shown on drawings furnished with the equipment by the manufacturer.

4.5 Gas detection network shall be tested by a factory authorized representative. A minimum of 25% of the sensors shall be tested by injecting the target from certified gas cylinders. The Control Panel's sequence of operation shall be tested by simulating alarm levels with the use of gas cylinders.

5.0 OPTIONS

5.1 Provide on Control Panel selector switches with pilot lights to manually override all of the fans controlled by the system.

5.2 Provide in the Control Panel a battery back-up to maintain the system in operation during a power failure. A compact rechargeable battery shall be used because of the reduced power requirement of the QuadSet CEW4 system.

5.3 Provide a Remote Alarm Station furnished with Audible/Visual alarm with silencing button.

5.4 For larger systems, after complete installation, a representative of ACME ENGINEERING shall check the installation before the system is started. A written report shall be submitted to the engineers, contractor & owner.