



HAZARDOUS GAS DETECTION & MONITORING SPECIALISTS

# Vehicle Exhaust Monitoring with the AMC Gas Monitor

## AMC 1AD1/D2 Gas Monitors

Monitoring requiring multiple sensors for CO, NO<sub>2</sub> and Combustibles.

Each zone can have up to eight sensors in series, more depending on cable runs between modules and the monitor. Typical cable runs for eight sensors will be 150feet between each module for a maximum of 1200 feet using 18awg shielded cable.

Each zone includes LED Indication of Power, Fail, Warning and Alarm, 2x DPDT 10amp relay outputs and Audible Alarm.

**AMC-1AD1:** Single Zone (Up to 8 sensors)

**AMC-1AD2:** Two Zone (Up to 16 sensors)



## AMC 122X Series Sensor Modules (for use with AMC-1AD1/D2)

**AMC-1228-20 CO:** (Carbon Monoxide) Electrochemical sensor module with five years expected life and three year warranty.

**AMC-1228-28 NO<sub>2</sub>:** (Nitrogen Dioxide) Electrochemical sensor module for diesel fume detection with two years expected life and one year warranty.

**AMC-1222:** Combination CO and NO<sub>2</sub> sensor module includes on-board electrochemical CO and NO<sub>2</sub> sensors. Special "Comfort Zone" setting to set NO<sub>2</sub> detection sensitivity for the best possible detection of diesel fumes.

**AMC-1225:** Solid State combustible gas sensor module will detect a wide range of combustible gases including Propane, Natural Gas and many more.



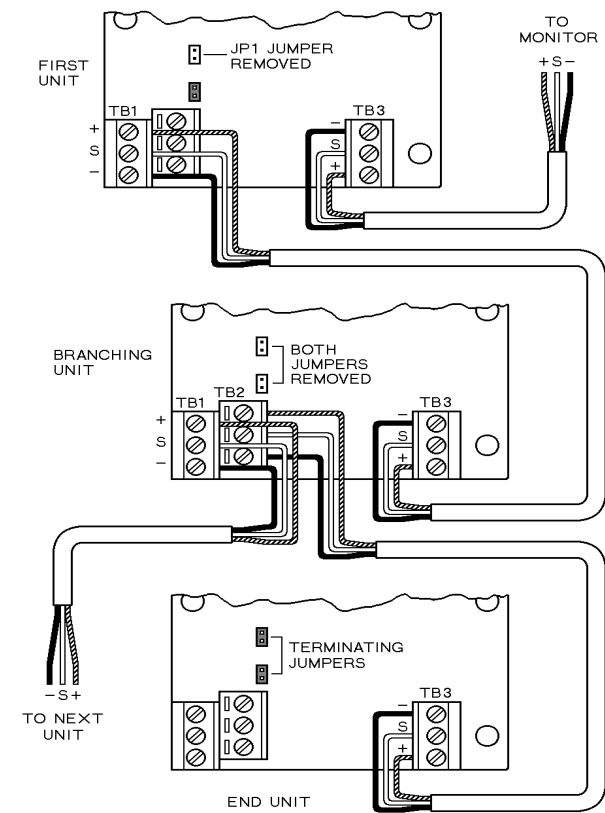
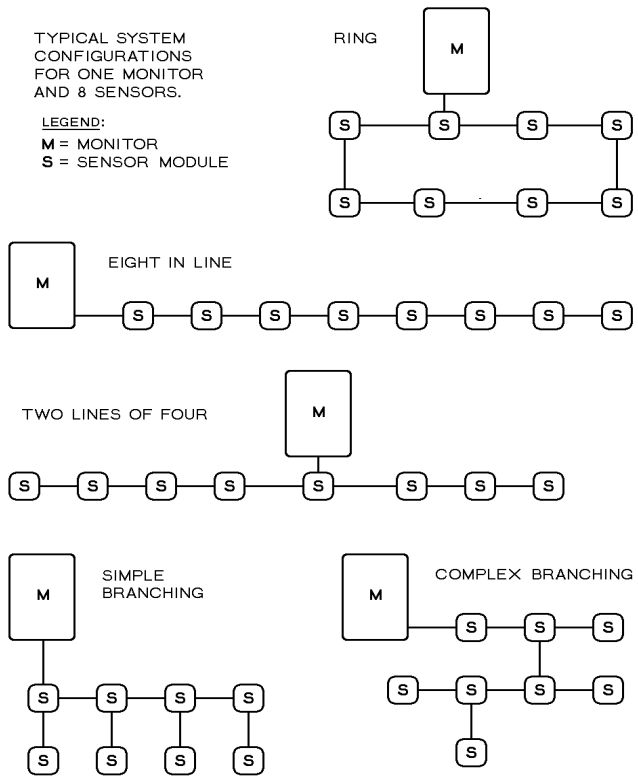


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## AMC 1AD1/D2 Notes

- ◆ Each zone includes one set of relays...The relays are common to all eight sensors on a zone.
- ◆ Each zone includes LED indication common to all sensors. Each sensor module includes individual LED indicators.
- ◆ **Sensor Mounting:**
  - AMC-1228-20 CO should be mounted at 3-4 ft from finished floor
  - AMC-1228-28 NO<sub>2</sub> mounting is determined by application
  - AMC-1222 Combo CO/NO<sub>2</sub> sensor should be mounted at 3-4 ft from finished floor
  - AMC-1225 Combustible mounting is determined by application
- ◆ Each sensor module will cover up to 7500 sq ft of open floor space. More sensors may be required if there are obstructions in the space. Combustible gas sensors should be mounted based on the density of the gas, i.e. propane near the floor and methane near the ceiling.





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## Vehicle Exhaust Monitoring with the AMC Gas Monitor

### Sample Specification

#### *MONITORING PANEL*

- ◆ Monitor shall be enclosed in a durable steel cabinet
- ◆ Dual DPDT 10A relays for alarm actuation and control of ventilation equipment and/or auxiliary alarms for each zone.
- ◆ LEDs indicating Power On, Alarm, Warning and Fail, plus a user selectable audio indicator capable of being silenced for warning or alarm.
- ◆ Test sequence activated by single push button.
- ◆ Minimum run timer to prevent “short cycling” of interlocked equipment
- ◆ Alarms shall be equipped with user selectable time delays whereby, when chosen, warning and alarm conditions must prevail for five minutes respectively before activation occurs.
- ◆ Alarms shall be equipped with dead band which requires gas levels to decline slightly below the original trip point before alarms will automatically reset.
- ◆ Monitor power supply shall accommodate two zones, with up to eight multi drop gas sensor modules per zone.
- ◆ Monitor can accommodate sensors wired in ring, stub, double stub, and star configurations.

#### *MULTI DROP GAS SENSOR MODULES*

- ◆ Sensor modules with electrochemical CO and/or NO<sub>2</sub> sensors , and solid state combustible sensors
- ◆ Sensor modules will have status LEDs for low, high and power/fail indication.
- ◆ Modules will be calibrated for :
  - 0-100 PPM CO, with alarms at 25 PPM and 100 PPM
  - 0-10 PPM NO<sub>2</sub>, with alarms at 1 PPM and 3 PPM
  - 0-50% LEL for combustibles with alarms at 20% LEL and 40% LEL
- ◆ Mounted at 3-4 ft level for CO (NO<sub>2</sub> and combustibles by application)
- ◆ Wired with three conductor 18 AWG shielded wiring for up to 1200 ft from monitor (maximum 150 ft between sensors).
- ◆ Modules provide two terminal blocks for further wiring to other sensors eliminating need for additional junction box and reducing risk of improper wiring of system.

#### Approvals and warranty

All components shall be CSA approved and carry a full two year warranty against defects in material and workmanship (except NO<sub>2</sub> sensors for one year and CO sensors for three years).

#### Standard of acceptance

The Armstrong Monitoring Corporation model #AMC 1AD $\underline{X}$  monitor and #AMC 122 $\underline{X}$  series multi drop gas sensor modules.



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## Vehicle Exhaust Monitoring with the AMC Gas Monitor

### AMC 1ACO Carbon Monoxide Monitor

Ideal for monitoring smaller areas or garages (up to 7500 sq. ft.) for carbon monoxide

AMC-1ACO comes complete with one on-board electrochemical sensor, LEDs for Power, Fail, Alarm and Warning indication, Audible Alarm, and 2 x DPDT 10amp relay outputs.

**AMC-1ACO:** All in one CO monitor with electrochemical sensor with five year expected life and three year sensor warranty.



### AMC 1AVC Combination CO/NO<sub>2</sub> Monitor

Ideally suited for monitoring small mixed vehicle areas, the 1AVC provides exhaust detection for all gasoline, diesel and propane powered vehicles.

AMC-1AVC comes complete with one on-board electrochemical CO sensor and one on-board electrochemical NO<sub>2</sub> sensor, LEDs for Power, Fail, Alarm and Warning indication, Audible Alarm, 2 x 10A DPDT comr relay outputs, and dual 4-20 mA outputs.

**AMC-1AVC:** All in one CO and NO<sub>2</sub> Monitor with electrochemical sensor (with five year expected life and three year sensor warranty) and electrochemical NO<sub>2</sub> sensor (with three year expected life and one year sensor warranty).



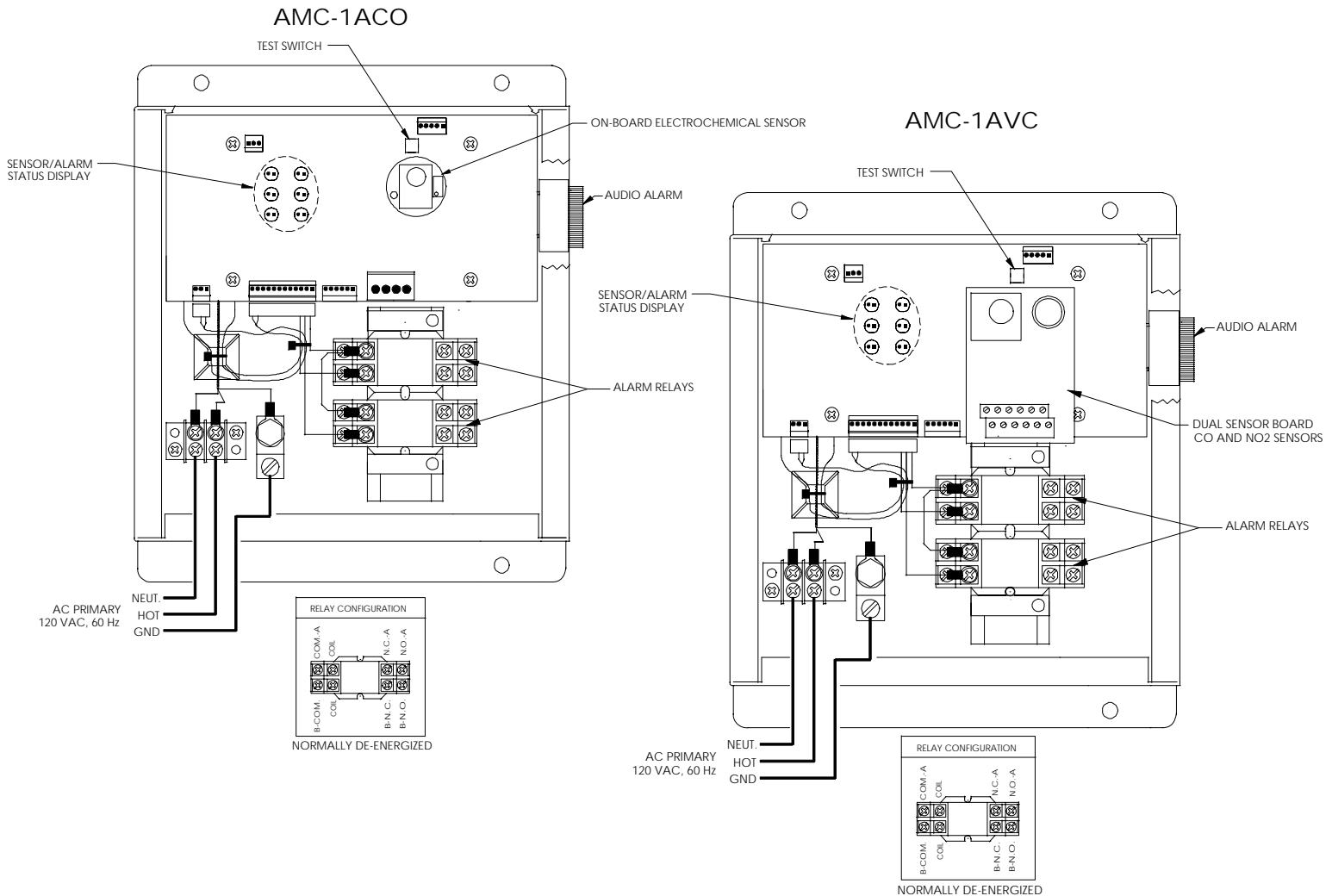
### Typical applications:

- » EMS (Fire Halls/Ambulance Bays)
- » Loading Docks
- » Service Garages/Dealerships
- » Parking Garages
- » Municipal Facilities
- » Warehouses



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## IMPORTANT INFORMATION

- » **AMC-1ACO will cover up to 7500 square feet of open floor space. Mounting height should be 3-4 feet from finished floor.**
- » **AMC-1AVC will cover up to 7500square feet of open floor space. Mounting height should be 3-4 feet from finished floor.**



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## Vehicle Exhaust Monitoring with the AMC Gas Monitor

### Sample Specification

Single channel, self-contained carbon monoxide monitor with integral electrochemical sensor.

Unit shall include:

- ◆ Durable steel enclosure
- ◆ Long life, factory calibrated electrochemical sensor.
- ◆ Dual alarm trip points set for 25 PPM and 100 PPM respectively.
- ◆ Time delay for turn on to prevent false alarms during warm up.
- ◆ Minimum run timer to prevent “short cycling” of interlocked equipment
- ◆ Dual DPDT 10A relays for alarm actuation and control of ventilation equipment and/or auxiliary alarm.
- ◆ LEDs for Power On, Warning, Alarm and Fail, plus an audible indicator capable of being silenced for warning or alarm.
- ◆ Test sequence for monitor activated by single push button.
- ◆ Tamper proof design with no accessible adjustments on exterior of cabinet.
- ◆ Alarms shall be equipped with user activated time delays whereby, when chosen, warning and alarm conditions must prevail for five minutes respectively before activation occurs.
- ◆ Alarms shall be equipped with dead band, which requires CO levels to decline slightly below the original trip point before alarms will automatically reset.
- ◆ Monitor should be mounted three to four feet (3-4 ft) above finished floor level and is capable of covering up to 7500 sq. ft.

#### Approvals and warranty

Detectors shall be CSA certified and carry a full two year warranty against defects in materials and workmanship. Sensor element warranted for three years

#### Standard of Acceptance

The Armstrong Monitoring Corporation model #AMC 1ACO



HAZARDOUS GAS DETECTION & MONITORING SPECIALISTS

## Vehicle Exhaust Monitoring with the AMC Gas Monitor

### Sample Specification

Dual channel, self-contained carbon monoxide/nitrogen dioxide monitor with integral electrochemical sensors.

Unit shall include:

- ◆ Monitor shall be enclosed in a durable steel cabinet
- ◆ Long life, factory calibrated electrochemical sensors.
- ◆ Dual alarm trip points set for 25 PPM and 100 PPM carbon monoxide, and 1 PPM and 3 PPM nitrogen dioxide.
- ◆ Time delay for turn on to prevent false alarms during warm up.
- ◆ Minimum run timer to prevent “short cycling” of interlocked equipment
- ◆ Dual DPDT 10A relays for alarm actuation and control of ventilation equipment and/or auxiliary alarm.
- ◆ LEDs for Power On, Alarm, Warning and Fail, plus an audible indicator capable of being silenced for warning or alarm.
- ◆ Test sequence for monitor activated by single push button.
- ◆ Tamper proof design with no accessible adjustments on exterior of cabinet.
- ◆ Alarms shall be equipped with user activated time delays whereby, when chosen, warning or alarm conditions must prevail for five minutes respectively before activation occurs.
- ◆ Alarms shall be equipped with dead band, which requires gas levels to decline slightly below the original trip point before alarms will automatically reset.
- ◆ Monitor should be mounted three to four feet (3-4 ft) above finished floor level and is capable of covering up to 7500 sq. ft.

#### **Approvals and warranty**

Detectors shall be CSA certified and carry a full two year warranty against defects in materials and workmanship. CO sensor warranted for three years and NO2 sensor warranted for one year.

#### **Standard of Acceptance**

The Armstrong Monitoring Corporation model #AMC 1AVC



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## Vehicle Exhaust Monitoring with the AMC Gas Monitor

### Design Considerations

Vehicle exhaust presents an interesting challenge when designing a gas detection system. Because of the wide variety of applications including underground parking garages, bus barns, maintenance facilities, tunnels, train stations, airports, loading docks, dealerships and warehouses, a number of different solutions exist to satisfy the varying requirements. Several factors must be taken into consideration when determining what type of system should be specified:

**Size of space to be monitored:** For most vehicle exhaust applications, systems are designed to have one sensor per 7500 square feet. In larger, wide-open spaces, where air is free to move freely, this can be expanded to 9000 square feet. In areas comprised of dividers, sections, corners and other barriers to free movement of air, this should be condensed to one sensor per 5000 square feet.

**Number of areas or zones:** If an area is to be partitioned into distinct areas for the purpose of ventilation, alarming, or other control functions, sensors can be lumped together in a per zone basis.

**Visual Indication:** Does the user require a real-time concentration readout, per sensor alarm indication (at the panel or sensor location) or will common alarm indication be sufficient.

**Output Requirement:** Are alarm contacts required, or will the user be providing his/her own control functions, therefore requiring only sensor/transmitters with analog (4-20 mA) output.

**Type of fuels being used:** If vehicles being monitored are gasoline, propane or natural gas powered only, then CO monitoring is sufficient. If however, diesel vehicles are being used, nitrogen dioxide (NO<sub>2</sub>) sensors should be used as well.

**Type of vehicles in use:** In diesel applications, the type of vehicle is relevant to sensor placement. In instances in which large trucks with vertical exhaust stacks are prevalent, NO<sub>2</sub> sensors should be mounted near the ceiling, as the exhaust will collect at the ceiling before slowly descending as it cools. In circumstances where fumes are exhausted near the ground as per a standard car or pick-up truck, sensors should be mounted at or about breathing level.

**Potential interference gases:** For areas such as maintenance garages or other spaces in which chemicals such as gasoline, varsol, ammonia, paint, or other solvents may be present, care should be taken to use electrochemical CO sensors in order to avoid false alarms resulting from interference gases.

**Desired sequence of operations:** The required sequence of operations for activation of auxiliary equipment must be taken into consideration when specifying systems. Are individual sensors to initiate particular operations, therefore requiring individual relay outputs, or will multiple sensors initiate single operations, therefore requiring only single, common relay outputs.

**Auxiliary equipment:** Care must be taken to ensure adequate control functions for all auxiliary equipment including ventilation, audible and visual alarms, and remote annunciation.

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**For more information:**