

Typical Sensor Location Considerations

The sensor mounting location within a space may be dependent on many variables. There are no specific formulas since each application will have its own determining factors and priorities.

These include, but are not limited to:

- source of gas*: Is the source a combustion exhaust from a vehicle or furnace or a vapour from a tank spill, pipe leak, or faulty valve?
- density of gas*: some gases are light than air and will rise, others are heavier and will migrate toward to the floor or into a pit
- use of the area*: Is there activity such as people working in the area or is it a storage room?
- normality of gas*: Is it a gas that is typical of the area and should be exhausted only if it increases to unsafe levels or is the gas not normally present and should be alarmed of immediately when sensed.
- governing regulations*: Are there any local regulations that must be adhered to regarding the placement of the sensor?
- exhaust equipment and vents*: Is there an air flow pattern in the room? Sensors should be downstream of the source to be able to respond to a problem. They should not be adjacent to a vent that may sense outdoor activity such as passing vehicles or wide variances in temperature.
- service and safety access*: A sensor should not be installed where it cannot be readily accessed for testing or in areas that may be unsafe to or from surrounding equipment and operations
- area layout*: alcoves, barricades, pits, unusual shapes, etc. may indicate that additional sensors should be used

Ammonia (NH₃):

Typical of arenas, chiller rooms, and food and drink packaging plants, ammonia is normally not present in the air unless a tank, valve, or pipe leak has occurred. Ammonia is light than air and will rise toward the ceiling. Mounting of the sensor on a wall or pillar near the ceiling is recommended to provide accessibility. For quick alarm response, the sensor should be mounted over the likely source of a leak, such as the storage tank or valving arrangement.

Carbon Monoxide (CO):

Parking and Repair Garages: Most parking garages have some degree of CO in the air at various times throughout the day, including excursions of high levels such as when vehicle is started. This is normal. The intent of the monitor is to keep the concentration at safe levels to the public by operating adequate exhaust. CO is about the same density as air and will readily disperse throughout an area where there may be some air movement and activity. The breathing zone (4'-6') should be the guideline for sensor location. Some local regulations may dictate lower or higher placement. Damage from equipment, vehicles, and direct blasts from vehicle exhaust should be considered. A typical layout in an open area warrants about one sensor per 5,000 sq. feet. This is approximately a 40' radius around each sensor or 80' between sensors.

EL shaped garages or garages with alcoves may require additional sensors. Repair pits should have individual sensors as gases may pool into these areas.

Residential Rooms with Combustion Appliances: CO exhaust may be present at low levels as a norm but it is not normal to have excursions of high concentrations.

Breathing zone is a guideline, although local regulations should dictate.

Methane (CH₄)

This is typically a by-product from sewage, wastewater, and landfills or commercially used for combustion in heating appliances, etc (natural gas). It is lighter than air and will migrate towards the ceiling. As it concentrates into ceiling pockets, the levels can become explosive. The sensor should be mounted near the ceiling level where the gas can become trapped. It should be accessible for regular testing by a service technician. As such, mounting on the wall near the ceiling is recommended for access with a ladder. Tubes can be installed for routine testing from the floor level where accessibility is hampered.

Nitrogen Dioxide (NO₂)

NO₂ is typically the targeted component of diesel exhaust since the NO₂ levels are likely to reach unsafe levels before other gases that may also be in the exhaust mix. NO₂ gas is heavier than air. In a service or maintenance garage with diesel engines, low concentrations of NO₂ gas are likely and normal. Worker activity and mechanical air movement will usually keep the NO₂ mixed into the air. Since the exhaust is initially hot, it will rise to the ceiling, where higher concentrations would be expected, but alarms may not be desirable. As the gas dissipates and cools, it will settle through the breathing zone toward the floor. As it passes the breathing zone, it should be monitored for unsafe levels. The breathing zone mounting of 4'-6' above grade is recommended. Repair pits should have individual sensors as gases may pool into these areas.

Propane (C₃H₈)

Typically used for combustion engines and heaters, propane is heavier than air and will pool towards the floor where the concentration can rise to combustible levels. Propane is not normally present unless a tank leak has occurred. Locate the sensor close to the source. Sensors should be mounted on the wall or pillar about 12-18" above grade to keep clear of floor cleaning equipment. If there are pits in the area, individual sensors should be mounted in each pit.

Refrigerants (R-11, R-22, R-123, R-134A)

Most refrigerants are heavier than air and will migrate toward to the floor. Refrigerant gas is not normal in a room and any presence will usually indicate a tank, pipe, or valve leak. Sensors should be mounted about 12-18" above floor grade near the source.