

Carbon Monoxide vs. Air

Where to Install a Carbon monoxide Alarm?

Gas or Vapor	Molecular Weight	Specific Gravity
Acetylene, C ₂ H ₂	26.040	0.900
Air	28.966	1.000
Ammonia	17.020	0.590
Argon, Ar	39.948	1.380
Benzene	78.110	2.696
Butadiene	54.090	1.870
Butane, C ₄ H ₁₀	58.120	2.006
Carbon Dioxide, CO ₂	44.010	1.519
Carbon Monoxide, CO	28.011	0.967
Chlorine	70.906	2.486
Deuterium	2.014	0.070
Ethane, C ₂ H ₆	30.070	1.038
Ethyl Chloride	64.515	2.230
Ethylene, C ₂ H ₄	28.054	0.968
Fluorine	37.996	1.310
Helium, He	4.020	0.138
Hexane	86.170	2.973
Hydrogen Chloride	36.461	0.070
Hydrogen Sulfide	34.076	1.268
Hydrogen, H ₂	2.016	1.176
Isobutene	56.108	1.940
Krypton	83.800	2.890
Methane, CH ₄	16.044	0.554
Methyl Chloride	50.488	1.740
Natural Gas	19.000	0.650
Neon, Ne	20.179	0.697
Nitric Oxide, NO ₂	30.006	1.037
Nitrogen, N₂	28.013	0.972
Nitrous Oxide	44.012	1.530
Octane	114.220	3.944
Oxygen, O ₂	31.999	1.104
Ozone	47.998	1.660
Pentane	72.150	2.487
Propane, C ₃ H ₈	44.097	1.522
Propylene	42.080	1.452
Sulfur Dioxide	64.060	2.264
Toluene	92.130	3.108
Water Vapor - Steam, H ₂ O	18.020	0.622
Xenon	131.300	4.530

Air has a molecular weight of 28.966. Gases with molecular weights less than 28.966 are lighter than air. Gases with a weight higher than 28.866 are heavier than air. Air is made up of 78% Nitrogen and 21% Oxygen - Nitrogen has a weight of 28.013 while Carbon Monoxide (CO) has a weight of 28.011. CO mixes with Air as their weights are approximately the same.

The National Fire Protection Association Standard - NFPA 720-2009 states "**A.9.4.1.2** *The location for effective performance is not generally dependent on mounting height. The density of carbon monoxide is similar to that of air at room temperature, and carbon monoxide generally mixes readily with air.*"

Underwriters Laboratories, UL 2034 - Standard for Single and Multiple Station Carbon Monoxide Alarms - does not include any requirements or tests for CO alarms installed at specific heights.

Answer: CO alarms can be installed at any height. All major manufacturers of CO alarms installed in homes have direct plug in the outlet models.