



# Application Note A72

## Glossary of Common Gas Compounds measured by VALTRONICS using the NDIR method

We design and build Non-Dispersive Infra-Red (NDIR) gas monitoring instruments to measure volumetric concentrations of the following gas compounds or families of similar compounds:

<u>chemical or family name</u>	<u>chemical formula</u>	<u>Application Areas</u> / <u>Notes</u>
<b>carbon dioxide</b>	<b>CO<sub>2</sub></b>	No Color, No Odor Cell growth <b>Incubators: 0 to 20% or 0 to 10%</b> , Indoor Air Quality ( <b>HVAC</b> ) 0 to <b>2000 ppm (0.2%)</b> , wineries, breweries, parking garages, warehouses, 0-5% truck & auto maintenance facilities, flu gas/boiler rooms Truck loading docks, CO <sub>2</sub> Blasters for safety, heat treating <b>NONTOXIC: TLV &amp; TWA = 5000 ppm CO<sub>2</sub> STEL = 3% CO<sub>2</sub></b> <b>NONFLAMMABLE</b> - See: <b>Application Note A11</b>
<b>carbon monoxide</b>	<b>CO</b>	No Color, No Odor Metal heat treating, International Automotive Exhaust gas 0 - <b>10% CO</b> or 0-3% <b>CO</b> for auto exhaust gas Very <b>TOXIC</b> gas: TLV = <b>30 ppm (0.003%) CO</b> <b>Flammable: LEL = 12.5% in air, UEL = 74% in air</b> LEL = Lower Explosive Limit UEL = Upper Explosive Limit See: <b>Application Note A9</b>
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<u>hydrocarbon family</u>		(Model 2015SPI-4 , 2015SPI-8, or 2286 old 2008SDH & 2010RT)
<b>methane</b>	<b>CH<sub>4</sub></b>	Oil well & pipe line safety, natural gas leak detectors <b>NONTOXIC</b> <b>Flammable: LEL = 5.0% in air, UEL = 15% in air</b>
<b>propane</b>	<b>C<sub>3</sub>H<sub>8</sub></b>	Oil well & pipe line safety, natural gas leak detectors <b>NONTOXIC</b> <b>Flammable: LEL = 2.2% in air, UEL = 9.5% in air</b>
<b>n-hexane</b>	<b>C<sub>6</sub>H<sub>14</sub></b>	Automotive exhaust gas analysis <b>NONTOXIC</b> <b>Flammable: LEL = 1.25% in air, UEL = 6.9% in air</b>
<b>n-butane</b>	<b>C<sub>4</sub>H<sub>10</sub></b>	Oil well & pipe line safety, natural gas leak detectors <b>NONTOXIC</b> <b>Flammable: LEL = 1.9% in air, UEL = 8.5% in air</b>
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<b>Ammonia</b>	<b>NH<sub>3</sub></b>	Industrial processes / people detect through smell <b>20 ppm</b> 0 - <b>2% NH<sub>3</sub></b> ( Model <b>2024</b> 2% NH <sub>3</sub> ) Very <b>TOXIC</b> gas: TLV = <b>35 ppm (0.0035%) NH<sub>3</sub></b> <b>Flammable: LEL = 15% in air, UEL = 28% in air</b>
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<b>Nitrous Oxide</b>	<b>N<sub>2</sub>O</b>	Hospital, Dental & Veterinary Clinics - detection <b>NONTOXIC</b> Model <b>6244</b> 1000 ppm N <sub>2</sub> O is <b>obsolete</b> <b>NONFLAMMABLE</b> Model 2008 & 2166 100% N <sub>2</sub> O

chemical or family name                      chemical formula                      Application Areas /                      Notes  
**Halocarbon family** or sometimes called **chloro-fluoro-carbons**                      See **Application Note A6**  
**FREON** ( Dupont Trademark )                      **Refrigerant** leak detectors **Model 2024**

**ASHRAE 15-1992 Designation**

R-11	Trichlorofluoromethane	$\text{CCl}_3\text{F}$	
R-12	Dichlorodifluoromethane	$\text{CCl}_2\text{F}_2$	
R-13	Chlorotrifluoromethane	$\text{CClF}_3$	
R-13B1(1301)	Bromotrifluoromethane	$\text{CBrF}_3$	
R-14	Tetrafluoromethane (Carbon tetrafluoride)	$\text{CF}_4$	
R-22	Chlorodifluoromethane	$\text{CHClF}_2$	
R-113	Trichlorotrifluoroethane	$\text{CCl}_2\text{FCClF}_2$	
R-114	Dichlorotetrafluoroethane	$\text{CClF}_2\text{CClF}_2$	
R-115	Chloropentafluoroethane	$\text{CClF}_2\text{CF}_3$	
R-123	2,2-Dichloro-1,1,1-Trifluoroethane	$\text{CHCl}_2\text{CF}_3$	
R-124	2-Chloro-1,1,1,3-tetrafluoroethane	$\text{CHClCF}_3$	
R-125	Pentafluoroethane	$\text{CHF}_2\text{CF}_3$	
R-134a	1,1,1,2-Tetrafluoroethane	$\text{CH}_2\text{FCF}_3$	
R-142b	1-Chloro-1,1-Difluoroethane	$\text{CH}_3\text{CClF}_2$	
R-143	1,1,2-trifluoroethane	$\text{CHF}_2\text{CH}_2\text{F}$	
R-143a	Trifluoroethane	$\text{CH}_3\text{CF}_3$	
R-152a	1,1-Difluoroethane	$\text{CH}_3\text{CHF}_2$	
R-C318	Octafluorocyclobutane	$\text{C}_4\text{F}_8$	
R-400	R-12 and R-114	$\text{CCl}_2\text{F}_2 / \text{CClF}_2\text{CClF}_2$	Mixture of <b>R-12</b> & <b>R-114</b>
R-500	R-12/152a ( 73.8% / 26.2%)	$\text{CCl}_2\text{F}_2 / \text{CH}_3\text{CHF}_2$	Mixture of <b>R-12</b> & <b>R-152a</b>
R-502	R-22 / 115 ( 48.8% / 51.2%)	$\text{CHClF}_2 / \text{CClF}_2\text{CF}_3$	Mixture of <b>R-22</b> & <b>R-115</b>
R-503	R-23 / 13 ( 40.1% / 59.9%)	$\text{CHF}_3 / \text{CClF}_3$	Mixture of <b>R-23</b> & <b>R-13</b>
R-507	R-125 / R-143a ( 50% / 50%)	$\text{CHF}_2\text{CF}_3 / \text{CH}_3\text{CF}_3$	Mixture of <b>R-125</b> & <b>R-143a</b>

**Sulfur Hexafluoride**



Model **2023DH** 3000 ppm  $\text{SF}_6$   
**NONTOXIC**  
**NONFLAMMABLE**

**ASHRAE** stands for **American Society of Heating, Refrigeration and Air-Conditioning Engineers, Inc.**