

## Detectable Gases

Family	Gas	Range	TLV <sup>1</sup>	LAL	Default Alarm		Response Time (T50) at 2 TLV Gas Concentr'n. (sec)	Max. Sample Tubing Length (m) <sup>12</sup>	Sample Line Particulates Filter <sup>2, 12</sup>	Sample Analysis Flow Rate (cc/min ±10%)	ChemCassette <sup>10</sup>				Allowable Days After First Use <sup>11</sup>	Optimum Temp Range (°C)	Optimum % RH Range for Best Accuracy <sup>7, 8</sup>	
					A1	A2					Name	Part Number (14d)	Part Number (30d)	Part Number (90d)				
Hydrides	Arsine (AsH <sub>3</sub> )	0.5-500ppb	5 ppb	1 ppb	2.5 ppb	5 ppb	55	30	A	250	Flex CC XP Hydrides	1265-4000	n/a	1265-3000	90	0-40	10-70% RH <sup>4, 5</sup>	
	Phosphine (PH <sub>3</sub> )	3-3000 ppb	300 ppb	1 ppm STEL	5 ppb	150 ppb	300 ppb										6	30-70% RH <sup>4, 5</sup>
	Diborane (B <sub>2</sub> H <sub>6</sub> )	5-1000 ppb	100 ppb		10 ppb	50 ppb	100 ppb										14	30-70% RH <sup>4, 5</sup>
	Silane (SiH <sub>4</sub> )	0.03 - 50 ppm	5 ppm		0.05 ppm	2.5 ppm	5 ppb										13	34-50% RH <sup>4, 5</sup>
	Germane (GeH <sub>4</sub> )	50-2000 ppb	200 ppb		100 ppb	100 ppb	200 ppb										245	40-50% RH <sup>4, 5</sup>
	Hydrogen Selenide (H <sub>2</sub> Se)	2-500 ppb	50 ppb		5 ppb	25 ppb	50 ppb										14	10-60% RH <sup>4, 5</sup>
	Hydrogen Sulphide (H <sub>2</sub> S)	0.001-9.999 ppm	1 ppm	5 ppm STEL	0.005 ppm	0.5 ppm	1 ppm	7									10-75% RH <sup>4, 5</sup>	
Mineral Acids	Hydrogen Fluoride (HF)	0.02-20 ppm	0.5 ppm	2 ppm STEL-C	0.03 ppm	1 ppm	2 ppm	7	5	B, C	Flex CC XP Mineral Acids	1265-4001	n/a	1265-3001	90	0-35	15-75% RH <sup>4, 5</sup>	
	Hydrogen Chloride (HCl)	0.02-20 ppm	2 ppm	STEL-C	0.03 ppm	1 ppm	2 ppm	5									30-50% RH <sup>4, 5</sup>	
	Hydrogen Bromide (HBr)	0.02-10 ppm	2 ppm	STEL-C	0.03 ppm	1 ppm	2 ppm	5									20-50% RH <sup>4, 5, 9</sup>	
	Boron Trifluoride (BF <sub>3</sub> )	0.05-10 ppm	0.1 ppm	0.7 ppm STEL/C	0.1 ppm	0.5 ppm	1.0 ppm	5									15-60% RH <sup>4, 5</sup>	
	Nitric Acid (HNO <sub>3</sub> )	0.02-20 ppm	2 ppm	4 ppm STEL	0.05 ppm	1 ppm	2 ppm	15									40-50% RH <sup>4, 5</sup>	
	Sulfuric Acid (H <sub>2</sub> SO <sub>4</sub> )	5-750 ppb	50 ppb	0.2mg/m <sup>3</sup>	10 ppb	25 ppb	50 ppb	2000									0.1	No filter
	Hydrogen Iodide (HI)	0.2-10 ppm	n/a	(2 ppm) PAC-1 = 1 ppm AEG1-1 = 1 ppm	0.03 ppm	1 ppm	2 ppm	15	0.1	No filter	35-55% RH <sup>4, 5, 9</sup>							
Mineral Acids (export unrestricted)	Hydrogen Fluoride (HF)	0.4-20 ppm	0.5 ppm	2 ppm STEL-C	0.4 ppm	1 ppm	2 ppm	7	5	B, C	Flex CC-U XP Mineral Acids	1265-4012	n/a	1265-3012	90	0-35	15-75% RH <sup>4, 5</sup>	
	Hydrogen Chloride (HCl)	0.02-20 ppm	2 ppm	STEL-C	0.03 ppm	1 ppm	2 ppm	5									30-50% RH <sup>4, 5</sup>	
	Hydrogen Bromide (HBr)	0.02-10 ppm	2 ppm	STEL-C	0.03 ppm	1 ppm	2 ppm	5									20-50% RH <sup>4, 5, 9</sup>	
	Boron Trifluoride (BF <sub>3</sub> )	0.05-10 ppm	0.1 ppm	0.7 ppm STEL/C	0.1 ppm	0.5 ppm	1.0 ppm	5									15-60% RH <sup>4, 5</sup>	
	Nitric Acid (HNO <sub>3</sub> )	0.02-20 ppm	2 ppm	4 ppm STEL	0.05 ppm	1 ppm	2 ppm	15									3	40-50% RH <sup>4, 5</sup>
	Sulfuric Acid (H <sub>2</sub> SO <sub>4</sub> )	5-750 ppb	50 ppb	0.2 mg/m <sup>3</sup>	10 ppb	25 ppb	50 ppb	2000									0.1	No filter
	Hydrogen Iodide (HI)	0.2-10 ppm	n/a	(2 ppm) PAC-1 = 1 ppm AEG1-1 = 1 ppm	0.03 ppm	1 ppm	2 ppm	15	0.1	No filter	35-55% RH <sup>4, 5, 9</sup>							
Oxidizers	Chlorine (Cl <sub>2</sub> )	0.005-5 ppm	0.5 ppm	1 ppm STEL	0.02 ppm	0.25 ppm	0.5 ppm	7	30	B, C	Flex CC XP Chlorine	1265-4002	n/a	1265-3002	90	0-40	30-55% RH <sup>4, 5</sup>	
	Chlorine (Cl <sub>2</sub> )	0.01-5 ppm	0.5 ppm	1 ppm STEL	0.05 ppm	0.25 ppm	0.5 ppm	9	30								5-75% RH <sup>4, 5</sup>	
	Fluorine (F <sub>2</sub> )	0.01-10 ppm	1 ppm	0.1 ppm OSHA PEL	0.05 ppm	0.5 ppm	1.0 ppm	5	10								0-85% RH <sup>4, 5</sup>	
	Nitrogen Dioxide (NO <sub>2</sub> )	0.03-10 ppm	0.2 ppm		0.05 ppm	0.1 ppm	0.2 ppm	56	30	B, C	Flex CC Fluorine/Oxidizers	1265-4004	1265-3004	n/a	30	0-40	10-70% RH <sup>4, 5</sup>	
	Chlorine Dioxide (ClO <sub>2</sub> )	20-1000 ppb	100 ppb	0.3 ppm STEL	25 ppb	50 ppb	100 ppb	36	10								5-90% RH <sup>4, 5</sup>	
		Ammonia (NH <sub>3</sub> )	0.01-150 ppm	25 ppm	35 ppm STEL	0.05 ppm	12.5 ppm	25 ppm	5									0-90% RH <sup>4, 5</sup>
Amines	Dimethylamine (DMA, C <sub>2</sub> H <sub>7</sub> N)	0.5-50 ppm	5 ppm	15 ppm STEL	0.1 ppm	2.5 ppm	5 ppm	10	30	B, C	Flex CC XP Ammonia	1265-4003	n/a	1265-3003	90	0-35	5-90% RH <sup>4, 5</sup>	
	Tetrakis (Dimethylamido) Titanium (TDMAT, C <sub>4</sub> H <sub>16</sub> N <sub>4</sub> Ti)	0.01-20 ppm	n/a		0.05 ppm	1 ppm	2 ppm	14									5-90% RH <sup>4, 5</sup>	
	Trimethylamine (TMA, C <sub>3</sub> H <sub>9</sub> N)	0.03-50 ppm	5 ppm	15 ppm STEL	0.05 ppm	2.5 ppm	5 ppm	10									1-90% RH <sup>4, 5</sup>	
	Phosgene (COCl <sub>2</sub> )	2-2000 ppb	100 ppb		5 ppb	50 ppb	100 ppb	15									1-95% RH <sup>4, 5</sup>	
Phosgene	Ethylchloroformate (ECF, C <sub>2</sub> H <sub>5</sub> ClO <sub>2</sub> )	0.02-30 ppm	n/a	PAC-1=1 ppm, AEG1-2=0.2 ppm (8hr), ERPG-2=5 ppm (AHA)	0.02 ppm	0.5 ppm	1 ppm	6 (@ 2 ppm)	30	A	Flex CC XP Phosgene	1265-4007	n/a	1265-3007	90	0-40	5-90% RH <sup>4, 5</sup>	
	Methylchloroformate (MCF, C <sub>2</sub> H <sub>5</sub> ClO <sub>2</sub> )	0.03-30 ppm	n/a	PAC-1=0.2 ppm, AEG1-2=0.7 ppm (8hr), ERPG-2=2 ppm (AHA)	0.03 ppm	0.1 ppm	0.2 ppm	10 (@ 0.4 ppm)									1-95% RH <sup>4, 5</sup>	
Diisocyanates	Toluene Diisocyanate (TDI, C <sub>9</sub> H <sub>7</sub> N <sub>2</sub> O <sub>2</sub> )	0.5-200 ppb	1 ppb	5 ppb STEL	0.6 ppb	1 ppb	2 ppb	10	0.15	no filter	Flex CC Diisocyanates	1265-4006	1265-3006	n/a	30	0-40	5-65% RH <sup>4, 5</sup>	
	Methylene Bisphenyl isocyanate (MDI, C <sub>15</sub> H <sub>9</sub> N <sub>2</sub> O <sub>2</sub> )	0.5-200 ppb	5 ppb		0.6 ppb	2.5 ppb	5 ppb	10									5-80% RH <sup>4, 5</sup>	
	Hexamethylene Diisocyanate (HDI, C <sub>12</sub> H <sub>22</sub> N <sub>2</sub> O <sub>2</sub> )	0.5-150 ppb	5 ppb		0.6 ppb	2.5 ppb	5 ppb	30									15-85% RH <sup>4, 5</sup>	
	Hydrogenated Xylene Diisocyanate (HMDI, C <sub>14</sub> H <sub>18</sub> N <sub>2</sub> O <sub>2</sub> )	0.5-150 ppb	5 ppb		0.6 ppb	2.5 ppb	5 ppb	15									25-85% RH <sup>4, 5</sup>	
	Methylene bis-(4-cyclohexylisocyanate) (HMDI, C <sub>14</sub> H <sub>22</sub> N <sub>2</sub> O <sub>2</sub> )	0.5-100 ppb	5 ppb		0.6 ppb	2.5 ppb	5 ppb	15									20-65% RH <sup>4, 5</sup>	
	Isophorone Diisocyanate (IPDI, C <sub>15</sub> H <sub>24</sub> N <sub>2</sub> O <sub>2</sub> )	0.5-150 ppb	5 ppb		0.6 ppb	2.5 ppb	5 ppb	15									5-90% RH <sup>4, 5</sup>	
	Xylene Diisocyanate (XDI, C <sub>12</sub> H <sub>16</sub> N <sub>2</sub> O <sub>2</sub> )	0.5-200 ppb	5 ppb		0.6 ppb	2.5 ppb	5 ppb	10	5-85% RH <sup>4, 5</sup>									
Hydrazines	Hydrazine (N <sub>2</sub> H <sub>4</sub> )	3-1000 ppb	10 ppb		5 ppb	5 ppb	10 ppb	220	3	no filter	Flex CC Hydrazines	1265-4008	1265-3008	n/a	30	0-40	15-90% RH <sup>4, 5</sup>	
	Monomethyl Hydrazine (MMH, CH <sub>3</sub> N <sub>2</sub> H <sub>3</sub> )	3-2000 ppb	10 ppb		5 ppb	5 ppb	10 ppb	110	5								20-75% RH <sup>4, 5</sup>	
	Dimethyl Hydrazine (UDMH, C <sub>2</sub> H <sub>8</sub> N <sub>2</sub> )	3-2000 ppb	10 ppb		5 ppb	5 ppb	10 ppb	110	5								10-70% RH <sup>4, 5</sup>	
	Hydrogen Cyanide (HCN)	0.2-30 ppm	4.7 ppm	STEL/C	0.5 ppm	2.4 ppm	4.7 ppm	15	30	A	Flex CC Hydrogen Cyanide	1265-4009	n/a	n/a	15	0-30	15-70% RH <sup>4, 5</sup>	
	Sulphur Dioxide (SO <sub>2</sub> )	10-2500 ppb	250 ppb	STEL	25 ppb	120 ppb	250 ppb	12	30	B, C	Flex CC Sulfur Dioxide	1265-4005	1265-3005	n/a	30	0-40	25-90% RH <sup>4, 5</sup>	
	Ozone (O <sub>3</sub> )	20-1000 ppb	100 ppb		25 ppb	50 ppb	100 ppb	55	5	no filter	Flex CC Ozone	1265-4011	1265-3011	n/a	30	0-40	15-90% RH <sup>4, 5</sup>	
	Hydrogen Peroxide (H <sub>2</sub> O <sub>2</sub> )	0.1-3 ppm	1 ppm		0.2 ppm	0.5 ppm	1.0 ppm	27	5	no filter	Flex CC Hydrogen Peroxide	1265-4010	1265-3010	n/a	30	0-40	35-50% RH <sup>4, 5</sup>	

1 Source: ACGIH 2016 TLVs and BEs.  
 2 A = 780248 (disposable particulate filter), B = 1830-0055 (filter membrane 0235-1072 must be replaced every 30 days), C = 1991-0147 (disposable filter for corrosive gases)  
 Outside of RH range:  
 3 Tends to have lower response at higher humidities.  
 4 Tends to increase sensitivity at higher humidities (due to the chemistry of the reaction).  
 5 Tends to under-report at higher humidities (typically >75% RH) due to the gas characteristics to adhere or decompose on contact with water/moisture. The response seems to be lower but the actual gas concentration under these high humidity conditions will be lower than expected.  
 6 Tends to under-report in dry conditions (<25-30% RH).  
 7 Depending on the combination of temperature and humidity, even within the ranges specified above, a detector's performance efficiency can be influenced due to condensation, physical tape material changes, or optical changes. Consult Honeywell Analytics' Service Department.  
 8 Refer to TechNotes 971131 (ChemCassette®-based Instrument Accuracy and Precision) and 1998-0219 (Protocol for Testing Gas Detectors).  
 9 Slow recovery: Prolonged exposure to high levels of gas/vapor (2x TLV or above) can condense in the system and may require purging with dry clean air or inert gas.  
 10 For information about the expiration date of the ChemCassette, refer to "ChemCassette" on page 40 (Review menu).  
 11 The number of days from the installation date that the ChemCassette cartridge can be used. When the allowable-days limit is reached, or if the absolute expiration date (printed on cartridge) is reached, the detector will issue an Expired ChemCassette Cartridge fault. The type of expiration is found in the event history data field for the fault (either 1 [stale] or 2 [expired]). Replace the cartridge when this fault is issued. The only exception is if the cartridge was used only briefly and then removed from the detector and properly stored in the sealed bag at the recommended temperature. In this case, the cartridge can be used past the stale-tape date (but not past the absolute expiration date) by clearing the stale-tape fault before going into monitor mode. Advance the tape manually about five inches before installing the cartridge and entering monitor mode.  
 12 Do not use the optional sampling wand for those gases with recommended sample tubing lengths of less than five meters and no recommended sample line particulate filter.