January 2019

GrayWolf Specifications

AdvancedSense Pro®/AdvancedSense BE®/WolfPack®/DirectSense® Gas Sensor Specs Summary

Note: any sensor(s) used for life safety critical situations, such as OSHA TWAs or STELs, must be user calibrated or, at minimum, exposed to a target gas (bump tested) to assure sensor response *each day of use* with a reference gas close to the critical level. **Failure to carry out such tests may jeopardize the safety of people and property.**
Refer to the endnotes at the bottom of this document for additional information.

SENSOR	INSTR RES (ppm)	RANGE (ppm)	SENSOR LOD (ppm)	SENSOR DRIFT	T_{90} RESPONSE	RECO'D CALIBRATION FREQUENCY[i]	EXPECTED LIFE
NDIR							
Carbon Dioxide (CO_2)	1	0 to 10,000[ii]	1	<80ppm/year[iii]	≤20s	≤12 months	>10 years
Electrochemical							
Ammonia (NH_3) Standard Range	0.1	0.0 to 100.0	<1	5%/6 months	<60s	≤12 months	>24 months
Ammonia (NH_3) High Range	1	0 to 1000	12	10%/6 months	<90s	≤6 months	24 months
Arsine (AsH_3)	0.01	0.00 to 1.00	0.03	5%/6 months	<30s	≤12 months[iv]	>18 months
Carbon monoxide (CO combo w/H_2S sensor)	1	0 to 1000	1	4%/year	<35s	≤12 months	24 months
Carbon monoxide (CO solo)	0.1	0.0 to 750.0[ii]	<0.3[v]	<5%/year	<25s	≤12 months	36-60 months[v]
Chlorine (Cl_2)	0.01	0.00 to 20.00	<0.02	<10%/year	<60S	≤12 months[vi]	>24 months
Chlorine dioxide (ClO_2)	0.01	0.00 to 1.00	0.03	10%/6 months	<120s	≤6 months[iv]	12 months
Diborane (B_2H_6)	0.01	0.00 to 1.00	0.03	5%/6 months	<30s	≤6 months[iv]	>18 months
Ethylene oxide (EtO)	0.1	0.0 to 100.0	0.3	5%/year	<150s	≤12 months	>24 months
Fluorine (F_2)	0.01	0.00 to 1.00	0.02	5%/month	<80s	≤4 months[iv]	>18 months
Hydrogen (H_2)	1	0 to 2000	1	3%/year	<90s	≤12 months	>24 months
Hydrogen chloride (HCl)	0.1	0.0 to 30.0	0.7	3%/month	<70s	≤6 months	>24 months
Hydrogen cyanide (HCN)	0.1	0.0 to 30.0	0.2	5%/month	<50s	≤4 months	>18 months
Hydrogen fluoride (HF)	0.01	0.00 to 10.00	<0.1	<10%/6 months	<90s	≤6 months[iv]	>18 months
Hydrogen sulfide (H_2S combo w/CO sensor)	0.1	0.0 to 200.0	0.5	2%/year	<30s	≤12 months	24 months
Hydrogen sulfide (H_2S solo)	0.01	0.00 to 50.0	0.03	2%/year	<30s	≤12 months	36-60 months[v]
Nitric oxide (NO)	0.1	0.0 to 250.0	0.2	<5%/year	<45s	≤12 months	36-60 months[v]
Nitrogen dioxide (NO_2)	0.01	0.00 to 20.00	0.02	10%/year	<50s	≤12 months	36-60 months[v]

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Ozone (O_3)	0.01	0.00 to 1.0	0.02	10%/6 months	<60s	≤12 months[vi]	12-18 months[vii]
Phosgene ($COCl_2$)	0.01	0.00 to 1.00	0.02	5%/6 months	<120s	≤12 months[iv]	>12 months
Phosphine (PH_3)	0.01	0.00 to 10.00	0.05	<10%/year	<25s	≤6 months	>24 months
Silane (SiH_4)	0.1	0.0 to 50.0	<1	5%/6 months	<60s	≤12 months	24 months
Sulfur dioxide (SO_2)	0.01	0.00 to 50.00	<0.1	<4%/year	<35s	≤12 months	36-60 months[v]
	RES %	**Range %**	**LOD %**	**Full Scale**			
Oxygen (O_2)	0.1%	0.0 to 25.0%	0.2%	<1%/3 months	<15s	≤12 months	24-36 months[v]
PID (VOCs)							
Low Range	0.001	0.000 to 20.000[ii]	0.005	<10ppb/day (zero drift)[iv]	<5s	≤2weeks User, 12 months Factory	>5 years (except lamp & detector)[viii-ix]
Mid/Low Range	0.01	0.00 to 200.00[ii]	0.025	TBD	<5s	Daily User, 12 months Factory	>5 years (except lamp & detector)[viii]
Mid Range	0.1	0.0 to 2000.0	0.050	TBD	<5s	Daily User, 12 months Factory	>5 years (except lamp & detector)[viii]
High Range	0.1	0.0 to 10,000.0	0.1	<0.1ppm/day (zero drift)	<5s	Daily User, 12 months Factory	>5 years (except lamp & detector)[viii]

All specifications are subject to change without further notice.

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[i] Calibration cycles are based on Indoor Air Quality (IAQ) applications. Calibration may be User or Factory. However, annual factory calibration is also recommended, even if user calibrations are being performed.
Any sensor(s) used for safety critical situations, such as OSHA TWAs or STELs, must be user calibrated or, at minimum, exposed to a target gas (bump tested) to assure sensor response each day of use with a reference gas close to the critical level. Failure to carry out such tests may jeopardize the safety of people and property.
For optimum accuracy, it is advised to perform more frequent user calibrations of zero and/or span (dependent on application). GrayWolf makes the user calibration procedure simple and reliable. The software walks users through the calibration process. Calibration kits and appropriate reference gasses are available for shipment to most locations.

[ii] Higher range (to 2x that listed) available with this sensor, but requires special calibration (and at reduced accuracy). Higher overall range available with alternative sensor.

[iii] Over the "IAQ critical range" (350ppm to 1500ppm), based on GrayWolf data and long-term experience.

[iv] For User calibrations, a surrogate reference gas is recommended. Contact GrayWolf for details.

[v] This specification is enhanced vs. the sensor mfg. spec based on GrayWolf data & long-term experience.

[vi] For User calibrations, NO2 surrogate ref. gas is recommended as it is easier to work with than Cl2 or O3 gas.

[vii] This specification is reduced vs. the sensor mfg. lifetime spec based on GrayWolf data & long-term experience.

[viii] Lamps, which carry a 1 year warranty, are rated >5000 hours lit and usually perform far better. Unless clients are running 24/7, GrayWolf's experience is that it is rare to replace lamps or detectors before 4 years.

[ix] PID up to 95% RH can be specified for high humidity environments.