

Hydrogen Sulfide (H₂S) Sensor

Technical Data Sheet



The information contained within this document is a supplement to the MSA transmitter user manual.

Performance Specifications						
APPLICABLE PRODUCTS	ULTIMA® X5000 Gas Monitor General Monitors S5000 Gas Monitor					
RANGE	0–10 ppm	0–20 ppm	0–50 ppm		0–100 ppm	
X5000 GAS CODE	20		21		22	
S5000 GAS CODE	D20	D24	D21	D25	D22	D26
DEFAULT SPAN VALUE	5	10	40	25	40	50
DEFAULT ALARM 1	1	1–6	5	1–15	10	1–30
DEFAULT ALARM 2	3	2–12	15	2–30	30	2–60
SENSOR DESIGN	XCell® Non-consuming Electrochemical Sensor					
SAFESWAP	Sensor can be changed under power					
TRUCAL®	Simulated calibration that compensates for environmental effects and monitors sensor operation.					
WARRANTY/SHELF LIFE	3 years					
SENSOR LIFE²	> 5 years					
CALIBRATION	For greatest accuracy and zero stability, allow powered sensor 24 hours to acclimate before performing first calibration.					
FREQUENCY	No preventative maintenance required. Device will call for calibration when required.					
REGULATOR	1 LPM					
ZERO GAS	Recommended					
CYLINDER BALANCE	N ₂ or Air					
CAUTION	Calibration gas expires faster than other gases. Check expiration date before use.					
ACCURACY^{1,4}	< ±1% of measured value					
LINEARITY¹	< ±2% of measured value					
OPERATING TEMPERATURE RANGE	–40°C to 60°C (–40°F to 140°F)					
OPERATING HUMIDITY RANGE						
INTERMITTENT	0% to 100 % relative humidity					
CONTINUOUS	10% to 95% r.h. non-condensing					
TEMPERATURE EFFECTS						
ZERO SENSITIVITY	< 0.01 ppm/°C					
	< 0.1% of measured value/°C					
HUMIDITY EFFECTS						
ZERO SENSITIVITY	No effect					
	No effect—Corrected with TruCal®					
ZERO DRIFT¹	< 1% FS/year					
LONG-TERM DRIFT¹	< 2% FS/year					
RESPONSE TIME T₅₀¹	< 7 seconds					
RESPONSE TIME T₉₀¹	< 23 seconds					
RECOVERY TIME F₉₀¹	< 25 seconds					
GAS EXPOSURE LIMITATION³	None					
WARM-UP TIME (X5000, S5000)¹	2 min.					
ADDITIONAL CONSIDERATIONS	None					

Cross Sensitivity Data		
Gas Applied	Concentration Applied	Cross Sensitivity
ACETONE	1,000 ppm	0 ppm
ACETYLENE	100 ppm	0 ppm
ACRYLONITRILE	1,000 ppm	0 ppm
METHYL ALCOHOL	100 ppm	0 ppm
ETHYL ALCOHOL	100 ppm	0 ppm
AMMONIA	300 ppm	0 ppm
BENZENE	50 ppm	0 ppm
BUTADIENE	2,000 ppm	2.5 ppm
CARBON DIOXIDE	10,000 ppm	0 ppm
CARBON MONOXIDE	100 ppm	0 ppm
COS	50 ppm	0 ppm
CHLORINE	10 ppm	0 ppm
ETHYLENE	20 ppm	0 ppm
ETHYLENE OXIDE	100 ppm	0 ppm
ETHYL ETHER	100 ppm	0 ppm
FREON	1,000 ppm	0 ppm
FREON 404A	2,000 ppm	0 ppm
HEXANE	10,000 ppm	0 ppm
HYDROGEN	500 ppm	0 ppm
HYDROGEN CHLORIDE	40 ppm	0 ppm
HYDROGEN CYANIDE	35 ppm	0 ppm
HYDROGEN SULFIDE	40 ppm	40 ppm
ISOBUTANE	100 ppm	0 ppm
METHANE	10,000 ppm	0 ppm
METHYL MERCAPTAN	50 ppm	35 ppm
ETHYL MERCAPTAN	30 ppm	17 ppm
NITROGEN OXIDE	50 ppm	0 ppm
NITROGEN DIOXIDE	5 ppm	0 ppm
DI NITROGEN OXIDE	100 ppm	0 ppm
SULFUR DIOXIDE	10 ppm	0 ppm

¹ All performance values are typical as applied to new sensors in ambient laboratory conditions

² Individual results may vary based on individual sensor environmental exposure conditions

³ As tested per ISA standards

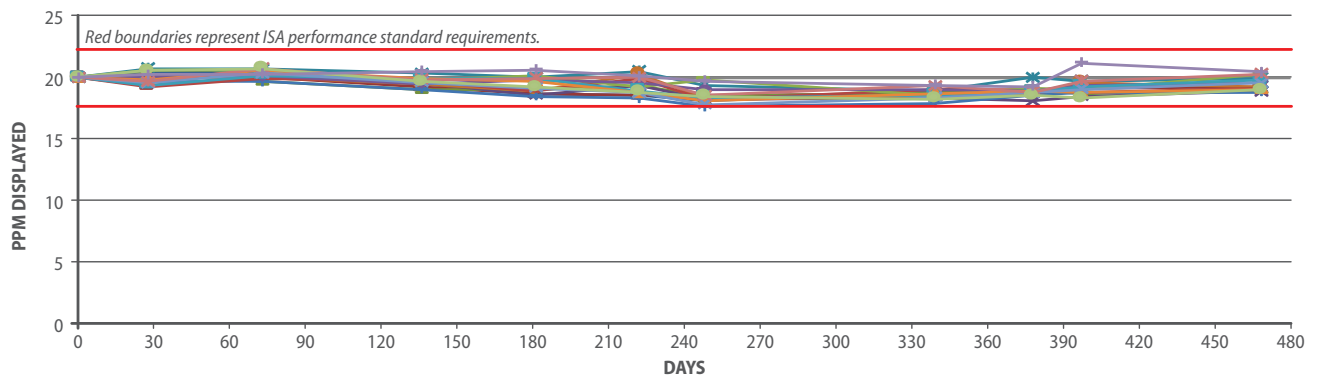
⁴ Does not account for variances in calibration gas accuracy.

TruCal®

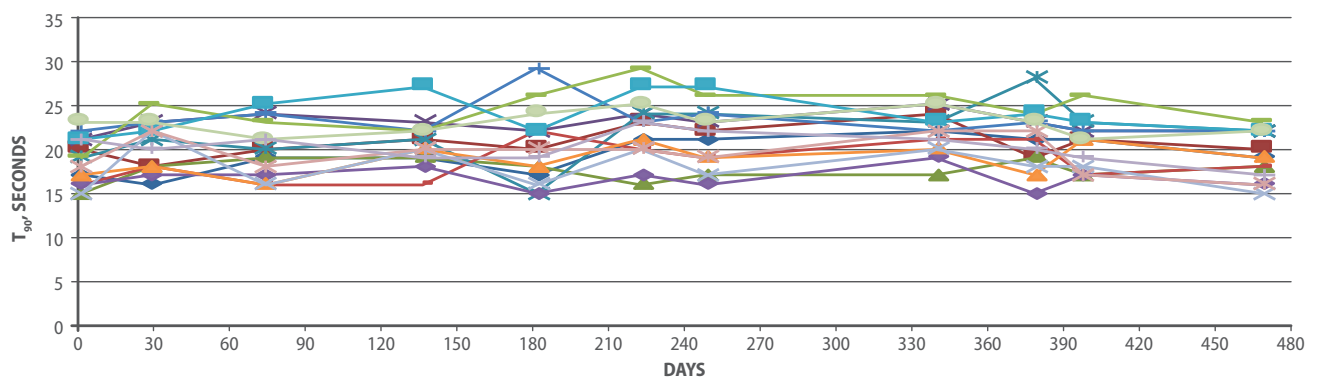
TruCal is a simulated calibration that adjusts sensitivity to compensate for environmental effects. This technology eliminates the need for regularly scheduled calibrations. The transmitter will let the user know when a manual calibration is required through slow flashing LEDs. We expect sensors to perform within stated performance specification for 18 months without manual calibration.

The following two graphs demonstrate the response of 16 H₂S sensors mounted outdoors in Cranberry, PA, USA that were calibrated with 20 ppm H₂S on day one, and then bumped with 20 ppm gas approximately every 30 days.

H₂S Sensor Accuracy—Outdoor Testing w/o Calibrations



H₂S Response Time—Outdoor Testing w/o Calibrations



Note: This Bulletin contains only a general description of the products shown. While product uses and performance capabilities are generally described, the products shall not, under any circumstances, be used by untrained or unqualified individuals. The products shall not be used until the product instructions/user manual, which contains detailed information concerning the proper use and care of the products, including any warnings or cautions, have been thoroughly read and understood. Specifications are subject to change without prior notice.

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