

XCell[®] Carbon Monoxide (CO) 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	0–100 ppm	0–500 ppm	0–1000 ppm	0–100 ppm H₂ Resistant (5%)
X5000 GAS CODE	10	11	12	14
S5000 GAS CODE	D10	D11	D12	D14
DEFAULT SPAN VALUE	60	300	400	60
DEFAULT ALARM 1	10	50	100	10
DEFAULT ALARM 2	30	150	300	30
SENSOR DESIGN	Non-consuming Electrochemical Sensor			
SAFESWAP	Sensor can be changed under power			
TRUCAL[®]	Simulated calibration that compensates for environmental effects and monitors sensor output			
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			
ACCURACY^{1,4}	< ±1% of measured value			
LINEARITY¹	< ±5% of measured value			
OPERATING TEMPERATURE RANGE	–40°C to 60°C (–40°F to 140°F)			
TEMPERATURE EFFECTS	ZERO < 0.05 ppm/°C SENSITIVITY <20°C/<70°F < 0.5% of measured value/°C SENSITIVITY >20°C/>70°F < 0.1% of measured value/°C			
HUMIDITY EFFECTS	ZERO No effect SENSITIVITY No effect—Corrected with TruCal [®]			
ZERO DRIFT¹	< 1% FS/year			
SPAN DRIFT¹	< 2% FS/year			
RESPONSE TIME T₅₀¹	< 3 seconds			
RESPONSE TIME T₉₀¹	< 9 seconds			
RECOVERY TIME T₉₀¹	< 10 seconds			
GAS EXPOSURE LIMITATION³	None			
WARM-UP TIME (X5000, S5000)¹	30 min. May require longer warm up times, see manual. For optimum sensor performance, allow sensor 24 hours to acclimate to conditions before performing first calibration.			
ADDITIONAL CONSIDERATIONS	None			

Cross Sensitivity Data		
Gas Applied	Concentration Applied	Cross Sensitivity
ACETONE	1,000 ppm	0 ppm
ACETYLENE	100 ppm	50 ppm
ACRYLONITRILE	1,000 ppm	0 ppm
METHYL ALCOHOL	100 ppm	40 ppm
ETHYL ALCOHOL	100 ppm	10 ppm
AMMONIA	300 ppm	0 ppm
BENZENE	50 ppm	0 ppm
BUTADIENE	2,000 ppm	200 ppm
CARBON DIOXIDE	10,000 ppm	0 ppm
CARBON MONOXIDE	100 ppm	100 ppm
COS	50 ppm	5 ppm
CHLORINE	10 ppm	0 ppm
ETHYLENE	20 ppm	50 ppm
ETHYLENE OXIDE	100 ppm	44 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	25 ppm ⁵
HYDROGEN CHLORIDE	40 ppm	0 ppm
HYDROGEN CYANIDE	35 ppm	0 ppm
HYDROGEN SULFIDE	40 ppm	0 ppm
ISOBUTANE	100 ppm	0 ppm
ISOBUTYLENE	100 ppm	0 ppm
METHANE	10,000 ppm	0 ppm
METHYL MERCAPTAN	50 ppm	0 ppm
ETHYL MERCAPTAN	30 ppm	0 ppm
NITROGEN OXIDE	50 ppm	57 ppm
NITROGEN DIOXIDE	60 ppm	2 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.

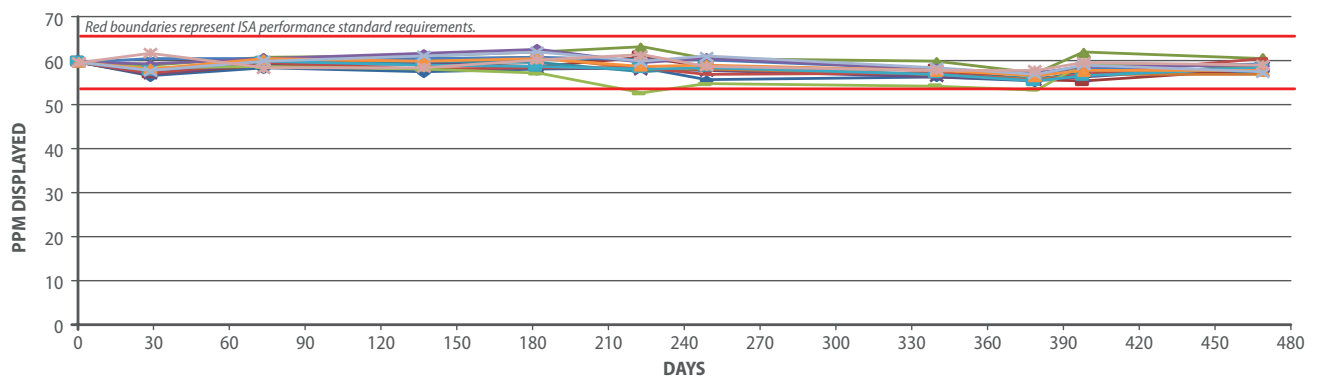
⁵ CO with H₂ resistance sensor shown. All cross sensitivities are the same, with the exception of Hydrogen.

TruCal®

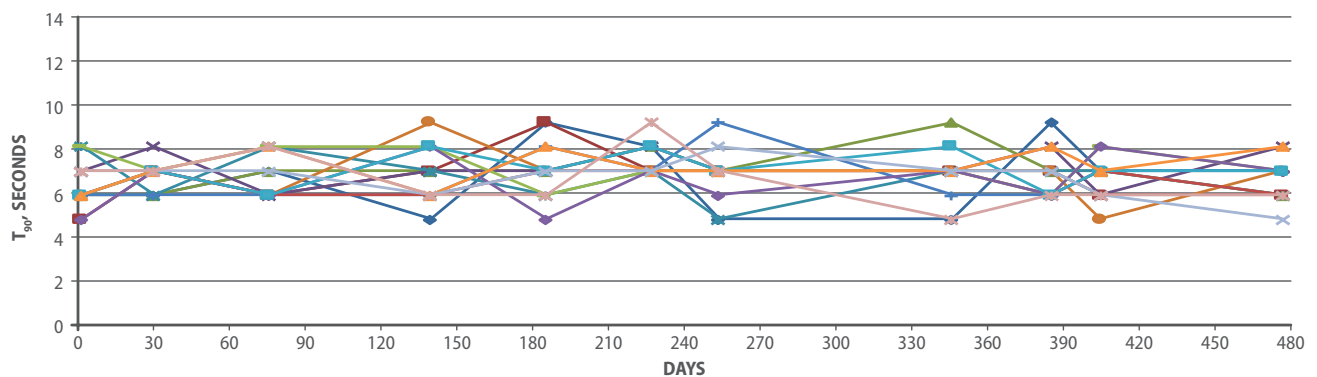
TruCal® is a simulated calibration that adjusts sensitivity to compensate for environmental effects. This technology eliminates the need for regularly scheduled calibrations. The transmitter will let the user know when a manual calibration is required through slow flashing LEDs. Sensors are expected to perform within stated performance specification for 18 months.

The following two graphs demonstrate the response of 14 CO sensors mounted outdoors in Cranberry, PA, USA that were calibrated with 60 ppm CO on day one, and then tested with 60 ppm gas approximately every 30 days.

CO Sensors Outdoor Testing, 60 ppm Gas Bump—Displayed Value



CO Sensors Outdoor Testing, 60 ppm Gas Bump—T₉₀



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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