



ALTAIR® 5X Multigas Detector

Bid Specifications

Physical Characteristics

GAS DELIVERY	Unit shall have non-detachable integral pump that is capable of sampling up to 75 ft. (22.86 m) at 0.3 lpm for standard versions of the ALTAIR 5X Multigas Detector.
SIZE, PUMPED UNIT WITHOUT IR	Instrument shall not exceed 6.68" L x 3.52" W x 1.95" H (16.9 cm L x 8.9 cm W x 4.2 cm H) in total size.
SIZE, PUMPED UNIT WITH IR	Instrument shall not exceed 6.68" L x 3.52" W x 1.65" H (16.9 cm L x 8.9 cm W x 5.0 cm H) in total size.
SIZE, PUMPED UNIT WITH PID	Instrument shall not exceed 6.69" L x 3.53" W x 2.02" H (17.0 cm L x 9.0 cm H x 5.1 cm H) in total size.
WEIGHT	Weight shall not exceed 1 lb. (453 g) or 1.15 lb. (680 g) (IR version).
HANDLING	Unit shall be a 1-hand operation device.
CASE MATERIAL	Unit shall have rugged rubberized armor.
ENVIRONMENTAL PROTECTION	Instrument shall be minimum IP65-rated for dust and water ingress.
DISPLAY LOCATION	Instrument display shall be viewable from the front.

Physical Characteristics

SENSOR CONFIGURATION	User shall be able to enable/disable individual sensor channels.		
SENSOR MISSING ALARM	All sensor channels provide missing sensor alarm if sensor has been removed and sensor channel has not been disabled.		
COMBUSTIBLE GAS DISPLAY	Instrument shall be capable of displaying combustible gas reading as % Lower Explosive Limit (LEL) or by % volume.		
PRESSURE COMPENSATION	Instrument oxygen sensor shall have built-in pressure compensation.		
SENSOR TYPES <i>Instrument shall be available with the following gas sensing options</i>	Gas Type	Range	Resolution
<i>Instrument shall be available with the following gas sensing options</i>	Combustible	0-100% LEL	1% LEL
	Combustible	0-5% Vol. CH ₄	0.05% Vol. CH ₄
	Oxygen	0-30% Vol.	0.1% Vol.
	Carbon monoxide	0-2000 ppm	1 ppm
	Carbon monoxide	0-10,000 ppm	5 ppm
	Hydrogen sulfide	0-200 ppm	1 ppm
	Hydrogen sulfide	0-100 ppm	0.1 ppm
	Sulfur dioxide	0-20 ppm	0.1 ppm
	Chlorine	0-10 ppm	0.05 ppm
	Ammonia	0-100 ppm	1 ppm
	Nitrogen dioxide	0-20 ppm	0.1 ppm
	Nitrogen dioxide	0-50 ppm	0.1 ppm
	Chlorine dioxide	0-1 ppm	0.01 ppm
	Phosphine	0-5 ppm	0.05 ppm
	Hydrogen cyanide	0-30 ppm	0.5 ppm
	Carbon dioxide, CO ₂	0-10% Vol.	0.01% Vol.
	Butane, C ₄ H ₁₀	0-25% Vol.	0.1% Vol.
	Methane, CH ₄	0-100% Vol.	1% Vol.
	Propane, C ₃ H ₈	0-100% Vol.	1% Vol.
	VOC	0-2000 ppm	0.1 ppm

Basic Operational Features

INSTRUMENT BUTTONS	Buttons on instrument must be easy to operate while user wears gloves.
INADVERTENT SHUTOFF	Instrument shall be designed to protect against accidental shutoff.
ZERO ADJUSTMENTS	Instrument shall provide Fresh Air Setup (FAS) function at user's discretion.
ZERO ADJUSTMENT SAFETY LOCKOUT	FAS function shall not allow unit to zero out hazardous readings.
CONFIDENCE SIGNALS	Instrument shall provide periodic audible and visual signals indicating instrument operation. User shall have option of disabling audible and visual signals if desired.
TIME/DATE	Instrument must be able to display time and date. User must be able to reset time and date without tools.
LAST CALIBRATION DATE	Instrument must be able to display last successful calibration date.
INSTRUMENT POWER-ON	Power-on instrument button must be clearly marked.

Advanced Display & Software Options

INDUSTRIAL HYGIENE DISPLAYS	Instrument shall have capability of displaying PEAK, STEL and TWA at user's discretion. User shall have ability to enable/disable STEL and TWA functions.
INSTRUMENT SETTINGS	All settable instrument parameters (alarm set points, expected calibration gas values, etc.) shall be protected by user-selectable password.
RESET OF FUNCTIONS	User shall be provided with capability of resetting PEAK, STEL and TWA readings in the field.
MEASUREMENT UNITS	Unit shall be capable of displaying both types of gas sensors installed and measurement units for each gas.

Instrument Alarms

MOTIONALERT™ FEATURE	Instrument shall offer standard MotionAlert feature. When activated, instrument shall eventually activate latch alarm when no instrument movement is detected for 30 seconds.
INSTANTALERT™ FEATURE	Instrument shall have InstantAlert feature to allow users manual activation of all alarms if situation requires.
VISUAL ALARMS	Visual alarms shall consist of bright, flashing LEDs on top and bottom of instrument and positive indication on unit's display for alarm type identification.
AUDIBLE ALARM	Audible alarm shall be rated at a typical >95 dB.
VIBRATING ALARM	Unit shall be offered with standard vibrating alarm.
LOCKALARM™ CIRCUIT FEATURE	Catalytic combustible channel shall have non-resettable latching alarm when combustible gas level exceeds 100% LEL, or 5.00% Vol. CH ₄ when no 0-100% Vol. CH ₄ IR sensor is installed.
AUTO RECOVER FEATURE	Catalytic combustible channel shall auto recover from Lockalarm Circuit situation if 0-100% Vol. CH ₄ IR sensor is installed and reading returns to low methane levels.
OXYGEN ALARMS	Oxygen channel shall have alarm set points for both oxygen deficiency and oxygen enrichment.
ALARMS SET POINTS	Alarm set points must be user-settable.
STEL AND TWA ALARM	Instrument shall provide audible, visual and vibrating alarms if STEL or TWA levels are exceeded. Alarm set points for STEL and TWA shall be user-selectable.
BATTERY ALARMS	Monitor shall provide user with 10-minute warning of battery power loss in all environmental conditions. Power consumption alarms shall activate audible, visual and vibrating alarms.

Instrument Power

RUN TIME	Instrument run time shall be at least 20 hours at room temperature. IR version run time shall be at least 17 hours at room temperature. PID version run time shall be at least 13 hours at room temperature. 5XM version run time shall be at least 18 hours at room temperature.
POWER SUPPLY	Instrument shall be equipped with rechargeable lithium-ion battery. Alkaline option available (except IR or PID).
BATTERY LIFE INDICATION	Monitor shall provide icon depicting estimated remaining battery operation time. Battery icon must always be visible when instrument is powered on.
CHARGING CRADLE	Optional charging cradle shall be offered.
CHARGER INPUT VOLTAGES	Chargers shall be available for 110VAC/220 VAC and 12-24 VDC.
CHARGING STATUS	Both instrument and charging cradle shall provide visual indication of battery charging status.

Calibration

CALIBRATION TOOLS	Unit shall require no special tools for calibration other than cylinder, regulator and tubing to supply gas to instrument.	
CALIBRATION ACCESS	Calibration access can be hidden behind password when desired.	
PUSHBUTTON CALIBRATION	Calibration shall be easily performed using instrument's pushbuttons. Internal instrument access or tools shall not be necessary for calibration.	
CALIBRATION TIME	Span calibration shall not exceed 60 seconds for LEL, O ₂ , CO, H ₂ S, SO ₂ , and NO ₂ XCell Sensors and PID. Other gases shall not exceed the following span calibration times:	
	<i>Gas Type</i>	<i>Span Time</i>
	Chlorine	2 minutes
	Ammonia	2 minutes
	Nitrogen dioxide (Series 20)	4 minutes
	Chlorine dioxide	6 minutes
	Phosphine	4 minutes
	Hydrogen cyanide	4 minutes
AUTOMATIC CALIBRATION	Instrument shall be compatible with optional automated test and with calibration system able to store data. External system shall automatically recognize and calibrate instrument and retain all calibration records.	

Sampling Systems

SAMPLING MODES	Instrument shall be available with internal pump.	
SAMPLING SYSTEMS FILTERS	Pump must contain user-replaceable filters to prevent liquids and dust ingress.	
ALLOWABLE SAMPLE LINE LENGTH	Instrument must be capable of sample draw from 50 ft. within 9 seconds or from 80 ft. (24.38 m) within 15 seconds.(Should be 1 ft./second rule of thumb, will verify in testing. Tubing up to a certain length (TBD) will need to be 1/16" ID and then 1/8" ID for anything longer.) Standard version ALTAIR 5X Detector.	
FLUID INGRESS PROTECTION	Sample probe shall be offered that is designed to prevent water and debris from entering instrument.	
REACTIVE GAS MONITORING	Special sample probe shall be offered when used with Cl ₂ , NH ₃ and ClO ₂ .	

Sensor Characteristics and Performance

SENSOR LIFE	LEL, O ₂ , CO, H ₂ S, NO ₂ , SO ₂ XCell sensors and IR sensors shall have expected 4-year life. NH ₃ and Cl ₂ sensors shall have expected 3-year life.	
END-OF-LIFE SENSOR INDICATOR	Instrument shall notify user when sensor is close to and at its end-of-life following calibration.	
TYPICAL t(90) RESPONSE TIMES¹	<i>Gas Type</i>	<i>Response Time</i>
	Combustible sensor	<10 seconds (methane) < 15 seconds (pentane)
	Oxygen sensor	< 10 seconds
	CO sensor	< 15 seconds
	H ₂ S sensor	< 15 seconds
	NH ₃ sensor	< 40 seconds
	SO ₂ sensor	< 10 seconds
	NO ₂ sensor	< 15 seconds
	Cl ₂ sensor	< 30 seconds
	IR CO ₂	< 35 seconds
	IR CH ₄	< 34 seconds
	IR C ₄ H ₁₀	< 35 seconds
	PID 10.6eV 2000 ppm	< 10 seconds

Sensor Characteristics and Performance (continued)

ALL SENSORS	All sensors should have built-in/dedicated control circuitry, including drive circuits, memory, microprocessor, and analog-to-digital converter to all for sensor level control and compensation.
OXYGEN SENSOR	Oxygen sensor shall be lead-free and use non-consumable chemical reaction.
COMBUSTIBLE SENSOR	Combustible sensor must have at minimum the following poison resistance: 3000 ppm ¹ hours to H ₂ S 90 ppm ¹ hours to silicon
CO / H₂S SENSOR	CO / H ₂ S sensor shall be designed with extremely robust carbon filter for CO channel to block interference. Sensor shall be designed for virtually no cross-channel interference.
NH₃ SENSOR	NH ₃ sensor shall use non-consuming chemical reaction and self-recover after significant gas exposures. Sensor shall have 3-year or greater expected life.
SO₂ SENSOR	SO ₂ sensor shall have response time of 10 seconds or less, use non-consuming chemical reaction and self-recover after significant gas exposures. Sensor shall have 3-year or greater expected life.
NO₂ SENSOR	NO ₂ sensor shall have response time of 15 seconds or fewer. Sensor shall have 4-year or greater expected life.
CL₂ SENSOR	Cl ₂ sensor shall have minimal drift even under dry conditions. Sensor shall have virtually no cross-interference with CO, H ₂ S and SO ₂ . Sensor shall have 3-year or greater expected life.
IR SENSORS	IR sensor shall not rely upon mirror to obtain appropriate path length, as mirrors are highly susceptible to humidity and to condensing atmospheric conditions.

¹ All response times are calculated using manufacturer-recommended operation.

² Dirt, dust and cleanliness of sampling line can and will impact response time.

Data Logging (Instrument Data Storage)

DATA LOGGING	Instrument must be available with standard data logging.
EVENT LOG	Instrument shall record at least 1000 events.
DATA LOG CAPACITY	Data log shall record and store data for average of 200 hours (at 1-minute intervals) without overwriting existing information during normal use.
GAS RECORD CONTENT	Data log entries shall contain as minimum date, time and record of peak and average readings for each gas sensor (oxygen shall be recorded as maximum and minimum for these intervals).
ATMOSPHERIC RECORD	Instrument shall have provisions to record atmospheric temperature changes.
RECORD INTERVALS	Time span among data records shall be user-selectable from 15 seconds to 15 minutes.
DATA RETENTION	Instrument data stored in memory shall not be lost or corrupted in event of sudden instrument power loss.
ACTIVITY RECORD CONTENT PAGE	Instrument data log shall record and be capable of reporting significant instrument events including: <ul style="list-style-type: none">• Gas and battery alarms.• Fresh air setups, sensor re-zeroing and calibrations.• Battery voltage and elapsed run time.

Certifications

NORTH AMERICA	
USA/UL	Class I, Division 1, Groups A, B, C & D Class II, Division 1, Groups E, F & G Class III, Division 1 Ambient temperature: -40°C to +50°C; T4 ALTAIR 5X Multigas Detector with alkaline battery pack T3/T4 ALTAIR 5X or ALTAIR 5X iR Multigas Detector with rechargeable battery pack T4
CANADA CSA	Class I, Division 1, Groups A, B, C & D CAN/CSA C22.2 No. 152 Combustible Gas Detection Instruments C22.2 No. 152 Performance Ambient Temperature: -20°C to +50°C C22.2 No. 157 Intrinsic Safety Ambient Temperature: -40°C to +50°C ALTAIR 5X Multigas Detector with alkaline battery pack T3/T4 ALTAIR 5X or ALTAIR 5X iR Multigas Detector with rechargeable battery pack T4
MINING	MSHA 30 CFR Part 22 PADEP



Certifications (continued)

EUROPE	
ATEX DIRECTIVE 94/9/EC	ALTAIR 5X Multigas Detector: II 2G Ex d ia mb IIC Gb IP65 – Zone 1 when XCell® Ex Sensor is installed. II 1G Ex ia IIC Ga IP65 – Zone 0 when XCell Ex Sensor is not installed. ALTAIR 5X Multigas Detector with rechargeable battery pack T4 I M1 Ex ia I Ma ALTAIR 5X iR Multigas Detector II 2G Ex d e ia mb IIC T4 Gb IP65 CE 0080 Directive 2004/108/EEC (EMC): EN 50270 Type 2, EN61000-6-3
AUSTRALIA / NEW ZEALAND	ALTAIR 5X & ALTAIR 5X iR Multigas Detector Ex ia sa IIC T4 (Zone 0) IP65 ALTAIR 5X Multigas Detector with alkaline battery pack T3/T4 ALTAIR 5X or ALTAIR 5X iR Multigas Detector with rechargeable battery pack T4 Ex ia sa I (Zone 0) IP65
IECEx - TEST SAFE AUSTRALIA	ALTAIR 5X & ALTAIR 5X iR Multigas Detector Ex ia mb d IIC IP65 – Zone 1 when XCell Ex Sensor is installed. Ex ia IIC IP65 – Zone 0 when XCell Ex Sensor is not installed. ALTAIR 5X Multigas Detector with alkaline battery pack T3/T4 ALTAIR 5X or ALTAIR 5X iR Multigas Detector with rechargeable battery pack T4 Ex ia I IP65 – Zone 0
MANUFACTURING SYSTEM QUALITY APPROVALS	Instrument manufacturer must be certified as compliant with ISO 9001 provisions.

Environmental

TEMPERATURE	
NORMAL OPERATION	0° to 40° C (32° to 104° F)
EXTENDED	-20° to 50° C (-4° to 122° F)
SHORT PERIODS (15 MINUTES)	-40° to +50° C (-40° to +122° F, all except PID)
HUMIDITY	
	15-90% RH (non-condensing) continuous
	5-95% RH (non-condensing) for short periods

Maintenance and Warranties

SENSOR REPLACEMENT	Sensors shall be easily accessed and replaced by users if desired by purchaser.
WARRANTY, CONSUMABLES	Instrument shall have 3-year back-to-back warranty under normal use conditions, including CO/H ₂ S/LEL/O ₂ /SO ₂ /NO ₂ XCell and IR Sensors. NH ₃ and Cl ₂ shall be warranted for 2 years. Other sensors shall be warranted for at least 12 months.

The RFID tag, with HID Global part number 629108-401 and stocked as MSA part number 10149728, is used in various types of MSA products such as, but not limited to, the ALTAIR 5X, ALTAIR 5X PID, ALTAIR 5X iR and other ALTAIR 5X Multigas Detector variants. This RFID tag has an operation frequency of 13.56 MHz and may be read up to a distance of 1.5 m with a long-range RFID reader.

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. MSA is a registered trademark of MSA Technology, LLC in the US, Europe, and other Countries. For all other trademarks visit <https://us.msasafety.com/Trademarks>.

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