Bid Specifications: ORION® *plus IR Detector*

UPGRADE

Physical Characteristics	
Size	Instrument shall not exceed 6.500”x 3.610”x 2.600” in total size.
Weight	Less than 1.1 pounds in Alkaline version.
Handling	Unit shall be easily held in one hand.
Case Material	High strength non-corrosive plastic, will prevent spark generation.
Environmental Protection	Instrument shall be rated to IP54 protection levels for dust and water ingress (water spray and fine particle dust).
Display Location	Display is viewable from the front and all angles.
Carrying Attachments	Unit shall have option of being provided with various options for belt attachment. • High strength plastic • Swivel Mount
Protective Jackets	Instrument shall be provided with various optional protective jackets with shoulder straps. These cases shall be available in the options of: • Leather • Rubber Boot

User Interfaces	
Display Type	Full graphic high contrast liquid crystal display (LCD) with automatic contrast adjustment with changing temperatures.
Gas Readings	All gas readings must be displayed simultaneously.
Backlight	Unit must be provided with backlight for low light viewing. Backlight must turn off automatically to conserve power.
Keypad/Switches	Unit must have no more than three switches or pushbuttons to operate. There shall be no requirement to access hidden or internal switches for any instrument operations.
Data Access	Access to data log records shall be non-intrusive using commercially available infrared links to IBM compatible computers.

Monitoring Capability

Number of Gases	Instrument shall be capable to be equipped with five sensors including 1 catalytic combustion sensor, 3 electrochemical sensors and 1 IR Sensor.			
Catalytic Combustible Gas Display	The instrument shall be capable of displaying the combustible gas reading as % Lower Explosive Limit (LEL) as well as up to 5%Vol.			
Pressure Compensation	The instrument oxygen sensor shall have built-in pressure compensation.			
Sensor Types	Instrument shall be available with the following gas sensing capabilities:			
	Gas Type	**Sensor Type**	**Range**	**Resolution**
	Combustible gases	Cat. combustion	0-100% LEL	1 % LEL
	Oxygen, O_2	Echem	0-25%	0.1 Vol.%
	Carbon Monoxide, CO	Echem	0-999 ppm	1 ppm
	Hydrogen Sulfide, H_2S	Echem	0-200 ppm	1 ppm
	Chlorine, CI_2	Echem	0 – 10 ppm	0.1 ppm
	Ammonia, NH_3	Echem	0 – 100 ppm	1 ppm
	Sulphur Dioxide, SO_2	Echem	0 – 20 ppm	0.1 ppm
	Nitrogen Dioxide, NO_2	Echem	0 – 20 ppm	0.1 ppm
	Chlorine Dioxide, CIO_2	Echem	0 – 1 ppm	0.02 ppm
	Phosphine, PH_3	Echem	0 – 5 ppm	0.05 ppm
	Ozone, O_3	Echem	0 – 1 ppm	0.02 ppm
	Phosgene, $COCI_2$	Echem	0 – 1 ppm	0.02 ppm
	Hydrogen Cyanide, HCN	Echem	0 – 50 ppm	1 ppm
	Carbon Dioxide, CO_2	IR	0-10 %	0.01 / 0.5 Vol.%
	Carbon Dioxide, CO_2	IR	0-50 %	5 Vol.%
	Butane, HC	IR	0-25 Vol%	0.1 Vol.%
	Butane, C_4H_{10}	IR	0-100 Vol%	1 Vol.%
	Propane, HC	IR	0-25 Vol%	0.1 Vol.%
	Methane, CH_4	IR	0-100 Vol%	1 Vol.%
	Methane, CH_4	IR	0-25 Vol%	0.1 % Vol
	Propane, C_3H_8	IR	0-100 Vol%	1 Vol.%
	Propane, C_3H_8	IR	0-100% LEL	1 % LEL

Basic Operational Features

Instrument Turn-on	Button to turn instrument ON must be clearly marked.
Inadvertent Shutoff	The instrument must be designed to protect against accidental shut off.
Zero Adjustments	The instrument shall provide a Fresh Air Setup (FAS) function at the user's discretion.
Zero Safety Lockout	The FAS function will prevent users from zeroing out hazardous readings.
Audible "Instrument On" Indicator	The instrument shall be provided with a periodic audible signal indicating that the instrument is in operation. The user shall be provided with the option to disable the audible signal if desired.
Time/Date	Instrument must be able to display time and date. User must be able to adjust (reset) time and date without tools.

Advanced Display and Software Options

Industrial Hygiene Displays	The gas detector must have the capability of displaying PEAK, STEL, and TWA at the user's discretion. PEAK must always be available. STEL and TWA only if activated.
TWA Saved When Off	The TWA reading must be maintained during routine battery charges.
Resettable Readings	User shall be provided capability to reset PEAK, STEL, and TWA readings.
Measurement Units	The unit shall be capable of displaying both the gas sensors installed and the measurement units for each gas.
Languages	The instrument shall be designed to provide language options for English, French, and

	Spanish.

Instrument Alarms	
Visual Alarms	Visual alarms shall consist of bright flashing LEDs and a positive indication on the display as to which gas sensor is in alarm.
Audible Alarm	The audible alarm shall be rated at 85 dB.
Lockalarm™ Feature	The combustible channel must have a non-resettable, latching alarm when the combustible gas exceeds 100% LEL on the catalytic combustion sensor.
Oxygen Alarms	The oxygen channel will have alarm setpoints for both oxygen deficiency and oxygen enrichment.
Alarm Set points	The instrument shall have two user settable alarm setpoints per measuring channel.
STEL and TWA alarm	The instrument shall provide an audible alarm if the STEL or TWA levels are exceeded. The user will be able to select alarm setpoints for STEL and TWA (toxic channels only).
Power Alarms	The monitor will provide a minimum of 5 minutes warning to user of battery power loss in all environmental conditions. • Power alarms shall be both audible and visually indicated on display
Sampling System Faults	The instrument shall have a pump malfunction and blocked flow alarm. This alarm system should not be dependent upon a pressure or flow sensor.

Instrument Power	
Intrinsically Safe Replacement	The user shall be capable of changing the battery packs in the field in the work area (will not invalidate intrinsic safety).
Rechargeable Option	The instrument shall have available a rechargeable pack option.
Battery life Indication.	The monitor shall provide the user with a “gas gauge” depicting estimated remaining battery operation time. Battery gas gauge must always be visible when the instrument is turned on.
Replaceable Option	The instrument shall have available a replaceable battery pack which can accept commercially available alkaline batteries.
Charger	The charger must be able to fully charge a depleted battery pack in less than 3 hours.
Charger Input Voltages	Chargers must be available for 110VAC/220VAC and 12-24VDC.

Calibration	
Calibration Tools	The unit shall require no special tools for calibration other than cylinder, regulator and tubing to supply gas to instrument.
Pushbutton Calibration	Calibration must be easily accomplished utilizing push buttons on the face of the instrument. Internal instrument access or tools shall not be necessary for calibration.
Calibration Cylinder Mixtures	In a standard five-gas configuration with IR CO_2 (Combustible, O_2, CO, CO_2, H_2S), it shall be calibrated from one cylinder.
Safety Calibration	Automatic safety calibration feature shall have an automatic failure if readings are not within expected gas ranges to help prevent calibration to improper gas levels.

Sampling Systems	
Sampling pump	Instrument shall be equipped with an internal sampling pump
Pump Power Source	The pump shall use the instrument power supply, thereby not requiring an additional battery pack or chargers.
Sampling System Filters	The pump must contain user replaceable filters to prevent the ingress of liquids and dust into instrument. The filter cover must be readily accessible without disassembling the instrument.
Sample Line Attachment	Sample lines must be easily attached without using any tools.
Sample Line Length	Instrument must be capable of drawing a sample from up to 50 feet away.
Fluid Ingress Protection	A sample probe that has provisions to prevent water and debris from entering the

	sample line must be available.

Data-logging (Instrument Data Storage)	
Data-logging	Instrument must be available with data-logging.
Datalog Capacity	The datalog shall record and store data for an average of 200 hours (at one minute intervals) without overwriting existing information in normal use.
Gas Record Content	Datalog entries shall contain as a minimum the date, time and a record of the peak and average reading for each gas sensor (oxygen shall be recorded as maximum and minimum for the intervals).
Record Intervals	The time between data records shall be user selectable (from 15 seconds to 15 minutes).
Data Retention	Instrument data stored in the memory shall not be lost or corrupted in the event of sudden instrument power loss or removal of the battery pack.
Activity Record Content	Instrument datalog shall record and be capable of reporting significant instrument events including: • Gas, pump, and battery alarms • Fresh Air Setups, Sensor rezeroing, and calibrations • Battery type and voltage

Certifications	
Intrinsic Safety Approval	The detector must be approved by : • Nationally Recognized Testing Laboratory (NRTL) as intrinsically safe to Class I, Division 1, Groups A B, C and D (UL, cUL). • European Testing Laboratory as ATEX II 2 G EEx ia e d IIC T3/T4 50/40C
Manufacturing System Quality Approvals	The instrument manufacturer must be certified compliant with ISO 9001 provisions.

Environmental	
Temperature	Normal Operation: -20 to 40° C Extended Range: -20 to 50° C
Humidity	15-90% RH (non condensing) continuous. 5-95% RH (non condensing) for short periods.

Maintenance, Warranties	
Sensor Replacement	Electrochemical and combustible sensors shall be easily accessed and replaced by users.
Warranty, Case and Electronics	The instrument electronics and mechanical components (excluding consumables) shall be provided with a two-year warranty.