



Ultima[®] Gas Monitor

MSA's new generation of gas monitoring systems.

Ultima®

Gas Monitor



MSA's Ultima Gas Monitor is a completely self-contained unit designed for the detection of combustible gases, toxic gases or oxygen. The Ultima Monitor can be connected to MSA's DAN® 2001 Digital Network System, Model 5000 or 6000 Instruments, Toxgard® Monitors or to a user's own readout device. In addition, the Ultima Gas Monitor can operate completely stand alone with its LCD display, alarm indications and optional relay outputs.

Features

The advanced features of the Ultima Monitor provide benefits never before available in a remote sensor/transmitter:

- Automatic calibration that eliminates errors due to differences in procedures.
- Calibration at pre-determined time/date with no manual intervention when used with Ultima Auto-Cal Module.
- Date of last successful calibration recorded within the Ultima Monitor.
- Optional Internal relay contacts for FAULT, WARNING and ALARM.
- Three levels of alarm including relay outputs when used with Ultima Monitor relay module.
- Over LEL detection of certain combustible gases.
- "Replace Sensor" indication when sensor nears its end-of-life.
- Real time clock for time and date stamping of events.
- Logging of minimum, maximum and average gas concentrations over pre-determined time intervals.
- Selectable lock-out of output signals during calibration to inhibit alarms and control actions.
- Digital, multi-drop communication

As a complete monitor, the Ultima Gas Monitor can operate independently providing a local display of the gas concentration, along with an analog output, alarm indications and optional relay outputs.

Design

All Ultima Gas Monitors, regardless of the gas selected for detection, are housed in a rugged, aluminum, epoxy-coated conduit enclosure. With the sensor mounted external to the enclosure, it is easily replaced by simply unscrewing the sensor housing and removing the plug-in sensor. No tools are ever required.

With its extremely low power consumption (less than 4mA nominal), the toxic and oxygen sensors can operate on a single twisted pair of wires, with high immunity to RFI and EMI.

All Ultima Monitors are shipped with an external wiring harness and are factory calibrated, making them ready for installation and immediate operation. The Ultima Monitor's unique design eliminates all potentiometers, jumpers, switches or any other type of internal adjustment. In fact, there is never a need to open the enclosure during installation and start-up.

Applications

Ultima Monitors can be applied in any application where there is a threat of the build-up of combustible gases, the presence of toxic gases, or oxygen deficiency.

Ultima Monitors are suitable for indoor and outdoor applications in virtually any type of industry including refineries, chemical and petrochemical facilities, steel mills, water and waste water, mining, and general industry.

Assemblies can be specified as explosion-proof or installed intrinsically safe for use in Class I, Div I, Group B, C, D areas and are rated NEMA 4X.

Combustibles

The Ultima Monitor combustible gas model features MSA's 1-S catalytic detector. The 1-S detector has proven to be extremely stable and reliable. It also exhibits a high immunity to silicones, sulfurs and chlorinated compounds that shorten the life of, or poison other combustible gas detectors.

The combustible model also has the ability to detect certain combustible gases above the LEL (lower explosion limit). High concentrations of combustible gas replace the oxygen necessary to catalytically burn the gas at the sensor. As a result, a sensor may show an ambiguous or what appears to be a normal reading, creating a potentially dangerous condition.

The Ultima Monitor eliminates this potential problem, distinguishing it from all other catalytic combustible gas detectors.

Toxics and Oxygen

Most Ultima toxic and oxygen models feature electrochemical cells manufactured by MSA. Built-in

The Ultima Gas Monitor is the ultimate gas monitor for use in refineries, chemical and petro-chemical, steel mills, water and waste water, mining and general industrial applications.

temperature compensation enables proper operation over the entire operating range.

All Ultima assemblies are shipped with a unique Sensorgard which protects the sensor from dirt, water, etc., while allowing gas to penetrate into the unit. The Sensorgard also acts as a baffle in windy environments.

Operation

Ultima Monitors normally operate in the diffusion mode, but also can be used with the Ultima Sampling Module in applications where it is necessary or more convenient to draw a sample from a remote location.

With the remote sensor version, sensors and transmitters can be separated for installations where access to the sensor may be difficult.

Outputs

All Ultima Monitors come standard with an LCD display for local indication of gas readings or any other stored parameter. Ultima Gas Monitors have several types of output options. Frequency or multiplex outputs allow for communication specifically to MSA Instruments. Milliamp outputs can be connected to MSA Instruments or a user's own readout device.

Additionally, with the optional internal relays, contacts are provided for both WARNING and ALARM levels. A normally-energized Trouble relay also provides a contact output for any condition that would not be considered NORMAL by the Ultima Gas Monitor.

Alternately, any Ultima Gas Monitor can be specified with a digital output for connection to MSA's DAN 2001 Digital Network System for gas monitoring.

While all of the information stored in the Ultima Gas Monitor can be accessed locally for viewing on the front panel LCD, many times it is desirable to have the capability to view this information, setup parameters, change alarm levels, etc. at a central location. The DAN 2001

Digital Network System accomplishes these tasks and many others, including: multi-drop communication, common system relays and many others. (See Data Sheet 1600-08 for more information about about MSA's Digital Network System.

Calibration

Although the Ultima Gas Monitor features tremendous stability, it is essential, as with all gas monitors, that it be calibrated periodically with the gas of interest to ensure proper operation.

The Ultima Monitor reduces the possibility of human error when performing a calibration. Simply activate the calibration mode and follow the instructions on the LCD display. It instructs the user when to apply zero and span gas. The Ultima Monitor automatically makes any necessary adjustments. There's no guesswork with the Ultima Gas Monitor. The actual gas readout is displayed during calibration.

When calibration is complete, the Ultima Monitor automatically returns to normal operation.

For convenient record keeping, the Ultima Monitor date stamps the last successful calibration.

With use of the optional Auto-Cal Module, calibration gas can even be permanently connected. The calibration process then takes place at designated time intervals, eliminating any manual intervention.

Two types of calibration communication devices are available for the Ultima Monitor. The Ultima Monitor's Calibrator and Controller both provide a digitally encoded signal for non-intrusive calibration and access to the advanced features. This patented technique eliminates tools as well as the need to open the enclosure during installation, set up, or calibration.

When the Ultima Monitor is located in hazardous areas, there is no need to de-classify the area, which saves time and improves safety. This eliminates possible access by unau-

thorized personnel, unlike competitive units which can be accessed by magnets or flashlights for calibration.



Calibrator

The Ultima Monitor Calibrator offers the industry's simplest method of calibration. It is an easy-to-use, three-button device that allows calibration

and address change of the Ultima Monitor. The Ultima Monitor Calibrator is available for those who do not need to access the Ultima Monitor's advanced features.



Controller

When access to all of the Ultima Monitor's features is desired, there is no need to upgrade or purchase the advanced features. The Ultima Monitor Controller provides complete

access to all features through its full-function keypad.

The controller is used to:

- Set the real time clock
- Set alarm levels
- Change span-gas values
- Display - date of last calibration
- Display - minimum, maximum and average gas values
- Change address
- Set future calibration time/date

in addition to providing basic calibration functions. It is completely password-protected.

Both the calibrator and controller are UL-approved as Intrinsically Safe. Either can be used to communicate with all Ultima Monitors; therefore, only one (1) is needed, regardless of how many Ultima Monitors you have.

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Specifications

Gas Types

Combustibles; oxygen; toxics

Temperature Range

Toxics and oxygen: -20° to +50° C
-4° to 122° F

(Range on some models may differ.)

Combustibles: -40° to +90° C
-40° to +194° F

Drift

Zero Drift: <5%/Yr., typically
Span Drift: <10%/Yr., typically

Noise Less than 1% FS

Accuracy

Repeatability: ± 1% FS or 2 ppm
Linearity: ± 2% FS (Combustible; O₂; CO)
± 10% FS or 2 ppm (others)

Step Change Response

T20 O₂ & toxics <12 sec. (Typ. 6 sec.)
T50 O₂ & toxics <30 sec. (Typ. 12 sec.)
T50 Combustibles <8 sec.
T90 Combustibles <20 sec.

Humidity 15%-95% RH, non-condensing

Sensor Life

Combustibles: 3 years typically
Toxics & O₂: 2 years typically
Full replacement warranty: 1 year

Hazardous Area Rating

O₂ & Toxics: Class 1, Div 1, Group
B, C & D, NEMA 4X

(explosion-proof or intrinsically safe models only)

Combustibles: Same as above except
Group B rating not available on intrinsically
safe version.

Wiring Requirements

mA output:
Toxics & O₂: 2-wire
(without accessories or sampling modules)
Combustibles: 3-wire
Frequency & multiplex outputs: 3-wire
Digital: see Bulletin 1600-08

Power Input

mA versions:
Toxics & O₂: 7-30 VDC
Combustible: 7-30 VDC @ 450 mA
maximum
Frequency & multiplex versions: Supplied by
MSA controllers
Digital: See Bulletin 1600-08

Signal Output

4-20 mA: 2-wire current sink -or-
3-wire current source-
(combustibles or Ultima Monitors with
accessories or sampling modules)

Frequency & multiplex: 4-9 khz

Optional Internal Relays:

Trouble, Warning, Alarm:

Digital: see Bulletin 1600-08

Internal Relay Contact Rating

5 amp @ 125 VAC; 5 amp @ 30 VDC

Physical

Size: 5.25"W x 4.5"D (13.3cm x 11.4cm)
Weight: 4.5 lb. (2.041 kg)
with optional internal relays:
Size: 5.25"W x 5.5"D (13.3cm x 14.0cm)
Weight: 5.0 lb. (2.268 kg)

Optional Modules

Relay Module

Provides three levels of alarm relay outputs along with a normally energized trouble relay. See Data Sheet 07-2019.

Auto-Cal Module

Provides a means to permanently connect calibration and zero gas. The Ultima Monitor then can be programmed to calibrate itself at pre-determined time and date. Relay Auto-Cal Module combines the Relay and Auto-Cal Module into a single assembly. See Data Sheet 07-2020

Sampling Module

Provides a method to draw a gas sample into the Ultima Monitor. See Data Sheet 07-2023.

Accessories

AC Power Supply

For AC-powered operation of an Ultima Gas Monitor.

Remote Sensor Assembly

Allows sensor to be separated from transmitter for difficult to reach installations.

Duct Mount Kits

Provides an easy method to install an Ultima Gas Monitor in a ventilation duct.

Flow Cap

Used when an Ultima Sampling Module or any other type of flow system is providing the gas sample to an Ultima Gas Monitor.

See Data Sheet 07-2022 for all Ultima Accessories.

Ordering Information

Ordering Sheet 0730-00.

Represented by:



Note: This Data Sheet contains only a general description of the MSA Ultima Gas Monitoring System. While uses and performance capabilities are described, under no circumstances should the product be used except by qualified, trained personnel, and not until the instructions, labels or other literature accompanying the product have been carefully read and understood and the precautions therein set forth followed. Only they contain the complete and detailed information concerning this product.



In U.S., 1-800-MSA-INST or FAX (724) 776-3280
In Canada, 1-800-267-0672 or FAX (416) 663-5908
Elsewhere, MSA International, (412) 967-3228
or FAX (412) 967-3373

Instrument Division: P.O. Box 427, Pittsburgh, PA 15230 U.S.A.
www.MSAnet.com