Ultima® Catalytic Combustible Replacement Sensor Kit

General

Due to an upgrade, it is now possible to plug in the Ultima Combustible Sensor without opening the unit's cover. While not necessary, it is possible to upgrade your sensor (see "Upgrading to use a Plug-in Sensor"). This Ultima Combustible Replacement Sensor Kit is used to replace combustible sensors in all Ultima models, with or without plug-in sensor capability.

See FIGURES 1 and 2 to determine if your model has a plug-in sensor. Some sensors may not be part of the readout assembly but may be remotely located within 50 feet of the readout assembly.

Before replacement, **remove power** from the Ultima Gas Monitor or remote sensor; then, refer to one of the two replacement procedures.

⚠ WARNING

Before removing the cover or sensor of an explosion-proof combustible Ultima Gas Monitor, sample the area around the enclosure with a portable combustible gas indicator (such as the MSA Passport ® Personal Alarm) to ensure surrounding area does not contain a flammable mixture of combustible gas and air. When the enclosure is open and connected to power, a source of ignition exists which could cause the explosion of combustible gas, resulting in damage, serious personal injury or death.

Procedure 1: Replacing a Non-plug-in Sensor

1. Unscrew, remove and save the black sensor cap or SensorGard from the bottom of the Ultima Gas Monitor (FIGURE 1) or remote sensor.
   - Some models use a white SensorGard in place of the sensor cap.
2. Discard the white disk and all gaskets and o-rings found in the sensor cap and black SensorGard.
   - The white SensorGard contains no gaskets or o-rings.
3. Unscrew the Monitor or Remote Sensor lid and disconnect the sensor:

Ultima Gas Monitor

a. Remove the two screws securing the front label assembly (FIGURE 3).
b. Pull up and remove the label assembly and the two attached printed circuit boards.
c. Remove upper portion of the terminal wiring connector containing sensor wiring (FIGURE 4); disconnect sensor wires and re-install upper portion of connector.

Remote Sensor

a. Record the Remote Sensor wiring connections on the following chart:

WIRE COLOR	CONNECTION
BLACK	
BLUE	
WHITE	

b. Unscrew sensor wires from terminal connector on the housing bottom.
c. Re-install screws on the terminal connector.

4. With a proper size wrench, remove sensor from the housing and discard .
5. Install the new sensor:

Ultima Gas Monitor

a. Route wire from new sensor through the sensor mounting entry. With the proper size wrench, install sensor into the threaded portion of the entry. Do not disconnect the white connector on the replacement sensor.
b. Remove upper portion of terminal wiring connector TB2; install sensor wires into this connector (see pc board wiring identification markings).

SENSOR WIRING CODE	WIRE COLOR
K	BLACK
COM	BLUE
W	WHITE

c. Re-install upper portion of the terminal wiring connector.
d. Re-install front label assembly and two pc boards in the condulet; ensure that connector at the center of board mates properly.

Remote Sensor

NOTE: Newer Remote Sensor models do not need the ring terminals; skip to Step e if your model doesn't have ring terminals.

a. Locate the three ring-terminals provided in this Kit.
b. With a crimping tool, install ring-terminals on the end of the sensor wires.
c. With a soldering tool, solder ring-terminals to the sensor wires.
d. Test each ring-terminal with an ohm meter to ensure connection.
e. Route wire from new sensor through the sensor mounting entry. With the proper size wrench, install sensor into threaded portion of entry; do not disconnect white connector on the new replacement sensor.
f. Install ring-terminals to the connector at the housing bottom (refer to the above TABLE); replace enclosure lid.

⚠ WARNING

Do not allow enclosure lid to remain off of a combustible Ultima Gas Monitor or Remote Sensor. Since a source of ignition is exposed, an explosion may occur if a metal object contacts the circuitry and produces sparks in an atmosphere of combustible gas.

6. **If your unit has the sensor cap:**
   - Use the smaller rubber sensor gasket and o-ring from this kit (FIGURE 5)
   - Discard the larger gasket
   - If a white disc and thin gasket are found when sensor cap is removed, discard them.
   - Install black sensor cap by screwing it onto the Ultima Monitor bottom with the gasket and o-ring in place.

If your unit has the white sensor cap:

- No gaskets or o-rings are needed
- Install the white SensorGard by screwing it onto the bottom of the Ultima Monitor.

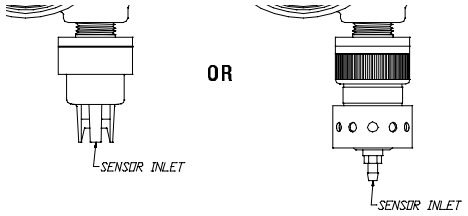


Figure 1. Non-plug-in Sensor Model

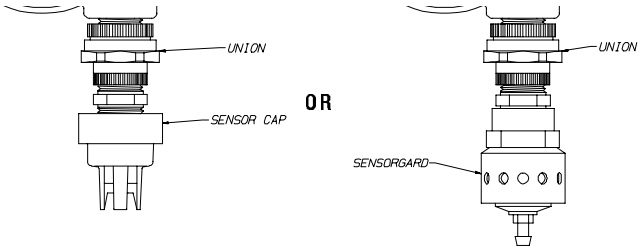
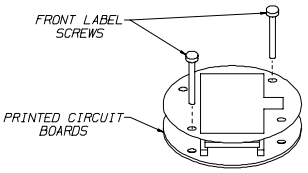


Figure 2. Plug-in Sensor Model

If your unit has the SensorGard cap:

- Use the larger rubber sensor gasket and the o-ring from this kit (see FIGURE 7)
- Discard the smaller gasket
- Install black SensorGard cap by screwing it onto the bottom of the Ultima Monitor (with the gasket and o-ring in place).

7. Wire the "DO NOT PAINT" tag to the body of the sensor.



⚠ WARNING

Ensure that the "DO NOT PAINT" tag is on the sensor. Painting on or around the sensor may cause paint to enter the sensor. This will clog, and interfere with, the gas diffusion to the sensor causing the sensor to be inoperative. An inoperative sensor will not warn the user and may result in injury or death.

8. Re-apply power to Ultima Gas Monitor.
9. Perform "INITIAL Calibration Procedure" given in Ultima Calibrator Instruction Manual (P/N 813167) or Ultima Controller Instruction Manual (P/N 813379). New sensors should be calibrated more often until calibration records prove sensor stability. Calibration frequency can then be reduced to the schedule set by the safety officer or plant manager.

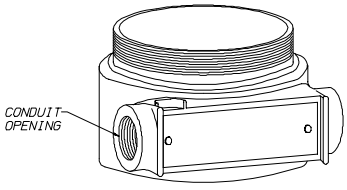


Figure 3. Accessing the Wiring Terminal Block

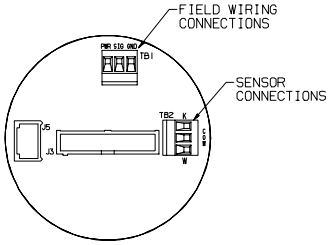


Figure 4. Sensor Wire Connections

Procedure 2: Replacing a Plug-in Sensor

1. Unscrew, remove and save black sensor cap from bottom of Ultima Gas Monitor (FIGURE 2) or Remote Sensor.
   - Some models use a white SensorGard in place of the sensor cap.
2. Discard white disk, all gaskets and o-rings found in sensor cap and SensorGard.
   - The white SensorGard contains no gaskets or o-rings.
3. With a proper size wrench, unscrew the large nut on the union until it is free and disconnect the sensor (FIGURE 2):

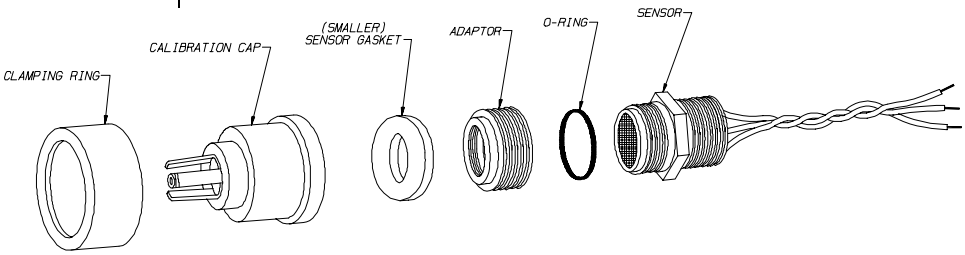


Figure 5. Ultima Gas Model Using Sensor Cap

P.O. BOX 427, PITTSBURGH, PA 15230

a. Pull sensor away from unit's housing until white connector is exposed (FIGURE 6).
b. Squeeze tab to disconnect white connector by squeezing the tab; pull connector apart to free old sensor.
c. With large pliers or wrench, remove the portion of the union attached to the old sensor; install this portion on the new sensor.

4. On the new sensor, squeeze the tab on the white connector and separate the connector (FIGURE 6). Discard the portion containing only the wires.
5. Attach white connector to its mate protruding from the new sensor enclosure. Gently pull on sensor to ensure retaining clip on the connector holds the sensor.
6. Slide the white connectors and the wire into the enclosure.
7. Hold sensor so that union mates; hand-thread union nut to secure the union.
8. With a proper size wrench, tighten the large nut on the union until it is tight; ensure that the sensor body does not rotate.
9. **If your unit has the sensor cap:**
   - Use the smaller rubber sensor gasket and o-ring from this kit (see FIGURE 5)
   - Discard the larger gasket
   - If a white disc and a thin gasket are found when the sensor cap is removed, discard.
   - Install the black sensor cap by screwing it onto the bottom of the Ultima Monitor with the gasket and o-ring in place.

   If your unit has the white sensor cap:
   - No gaskets or o-rings are needed
   - Install the white SensorGard by screwing it onto the Ultima Monitor bottom.

   If your unit has the SensorGard cap:
   - Use larger rubber sensor gasket and the o-ring from this kit (see FIGURE 7)
   - Discard the smaller gasket
   - Install the black SensorGard cap by screwing it onto the bottom of the Ultima Monitor (with the gasket and o-ring in place).
10. Wire the "DO NOT PAINT" tag to the sensor body.

⚠ WARNING

Ensure that the "DO NOT PAINT" tag is on the sensor. Painting on or around the sensor may cause paint to enter the sensor. This will clog, and interfere with, the gas diffusion to the sensor causing the sensor to be inoperative. An inoperative sensor will not warn the user and may result in injury or death.

11. Reapply power to the Ultima Gas Monitor.
12. Perform the "INITIAL Calibration Procedure" given in Ultima Calibrator Instruction Manual (P/N 813167) or Ultima Controller Instruction Manual (P/N 813379). New sensors should be calibrated more often until the calibration records prove sensor stability. The calibration frequency can then be reduced to the schedule set by the safety officer or plant manager.

Upgrading to Use a Plug-in Sensor

It is possible to upgrade your sensor via Union (P/N 638448) available from MSA (1-800-MSA-INST). Do not substitute any other union type as it will void the enclosure classification and may not be properly rated.

⚠ WARNING

Do not substitute any other type of union for this upgrade. An improperly rated union may provide a source of ignition which could cause a combustible gas explosion, resulting in damage, serious personal injury and death.

1. Locate the proper union and unscrew the large nut until the two halves are separated.
2. Remove the power from the Ultima Gas Monitor or the Remote Sensor.

⚠ WARNING

Before removing the cover of an explosion-proof, combustible Ultima Gas Monitor, sample the area around the enclosure with a portable combustible gas indicator (such as the MSA Passport® Personal Alarm) to make sure the surrounding area does not contain a flammable mixture of combustible gas and air. When the enclosure is open and connected to power, a source of ignition exists which could cause a combustible gas explosion, resulting in damage, serious personal injury and death.

3. Unscrew, remove and save the black sensor cap or SensorGard from the bottom of the Ultima Gas Monitor (FIGURE 1) or from the Remote Sensor.
   - Some models use a white SensorGard in place of the sensor cap .
4. If replacing the sensor, discard the white disk and all gaskets and o-rings found within the sensor cap or SensorGard.
   - The white SensorGard contains no gaskets or o-rings.
   - If not replacing the sensor, save these items.
5. Unscrew Ultima Gas Monitor or Remote Sensor lid.
6. Disconnect the sensor:

   Ultima Gas Monitor
   a. Remove the two screws securing the front label assembly (FIGURE 3).
   b. Pull up and remove the label assembly and the two attached printed circuit boards.
   c. Remove upper portion of the terminal wiring connector containing sensor wiring (FIGURE 4); disconnect sensor wires and re-install upper portion of the terminal wiring connector.

   Remote Sensor
   a. Record Remote Sensor wiring connections on chart:

WIRE COLOR	CONNECTION
BLACK	
BLUE	
WHITE	

   b. Unscrew sensor wires from the terminal connector on the bottom of the housing.
   c. Re-install screws on the terminal connector.
7. With proper size wrench, remove sensor from housing; discard if replacing.
8. With proper size wrench or pliers, screw and tighten threaded portion of union into the opening where the sensor was mounted.
9. With proper size wrench or pliers, screw and tighten the other half of the union onto the sensor to be used.
10. Disconnect white connector on sensor by pressing the small tab (FIGURE 6).

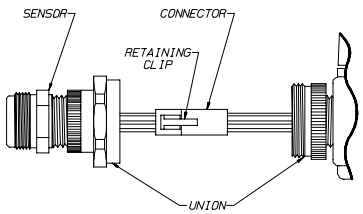


Figure 6. Plug-in Sensor

11. Install the new sensor:

    Ultima Gas Monitor
    a. Route connector wires through the entry where the union is mounted on the monitor housing.
    b. Remove upper portion of terminal wiring connector and install sensor wires into this connector. (see printed circuit board wiring identification markings).

SENSOR WIRING CODE	WIRE COLOR
K	BLACK
COM	BLUE
W	WHITE

    c. Re-install upper portion of the terminal wiring connector.
    d. Re-install the front label assembly and the two printed circuit boards in the condulet; ensure that the connector at the center of the board mates properly.

    Remote Sensor

    NOTE: New Remote Sensor models do not use ring terminals; skip to step e if your unit does not use ring terminals.

    a. Locate the three ring-terminals provided in this Kit.
    b. With crimping tool, install ring-terminals on end of connector wires.
    c. With a soldering tool, solder the ring-terminals to the wires.
    d. Test each ring-terminal with an ohm meter to ensure connection.
    e. Route the connector wire through entry where the union is mounted.
    f. Install the ring-terminals to the connector at the bottom of the housing (see above TABLE listing connections).
12. Attach white connector on the sensor to its mate protruding from the enclosure; gently pull on the sensor to ensure retaining clip on the connector holds sensor.
13. Slide the white connectors and the wire into the enclosure.
14. Hold sensor so that union mates; hand-thread union nut to secure the union.
15. With a proper size wrench, tighten the large nut on the union until it is tight; ensure that the sensor body does not rotate.
16. **If your unit has the sensor cap:**
    - Use the smaller rubber sensor gasket and o-ring from this kit (see FIGURE 5)
    - Discard the larger gasket
    - If a white disc and a thin gasket are found when the sensor cap is removed, discard them
    - Install the black sensor cap by screwing it onto the bottom of the Ultima Monitor with the gasket and o-ring in place.

    If your unit has the white sensor cap:
    - No gaskets or o-rings are needed
    - Install white SensorGard by screwing it onto the Ultima Monitor bottom.

    If your unit has the SensorGard cap:
    - Use larger rubber sensor gasket and the o-ring from this kit (see FIGURE 7)
    - Discard the smaller gasket
    - Install the black SensorGard cap by screwing it onto the bottom of the Ultima Monitor (with the gasket and o-ring in place).
17. Wire the "DO NOT PAINT" tag to the sensor body.

⚠ WARNING

Ensure that the "DO NOT PAINT" tag is on the sensor. Painting on or around the sensor may cause paint to enter the sensor. This will clog and interfere with the gas diffusion to the sensor, causing the sensor to be inoperative. An inoperative sensor will not warn the user and may result in injury or death.

18. Re-apply power to the Ultima Gas Monitor.
19. Perform "INITIAL Calibration Procedure" given in Ultima Calibrator Instruction Manual (P/N 813167) or Ultima Controller Instruction Manual (P/N 813379). New sensors should be calibrated more often until calibration records prove sensor stability. Calibration frequency can then be reduced to the schedule set by the safety officer or plant manager.

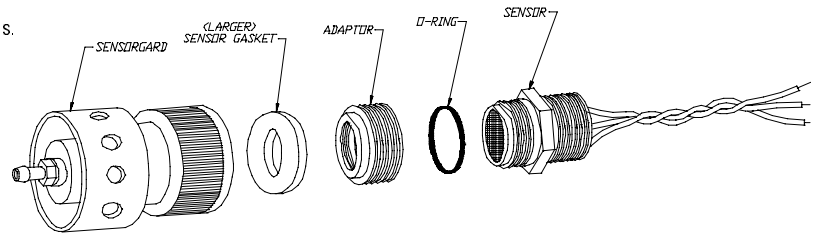


Figure 7. Ultima Gas Model Using SensorGard