

Calibration Test System for Ultima® Gas Monitor

This Calibration Kit (P/N 710410) is for calibrating only the following Ultima Gas Monitor gases:

- Chlorine
- Nitrogen Dioxide
- Hydrogen chloride
- Chlorine dioxide

The Flow Type Calibration Kit (P/N 492769) must be used for all other Ultima Gas Monitor gases.

⚠ WARNING

Do not attempt to calibrate the Ultima Gas Monitor with the wrong calibration kit. The sensor will give inaccurate readings and possibly not alert personnel of a hazardous condition; this situation may cause injury or death.

There are locations for carrying two calibration gas cylinders within the Calibration Kit. Normally, a zero and a span check gas are carried within the kit. Span check gas is always required, but zero check gas may not. Consult your safety engineer to determine if you need zero gas.

The Ultima Gas Monitor is factory-shipped with a preset span gas value which can be changed via the Ultima Controller (P/N 809086); otherwise, the span gas must correspond to the preset concentrations listed in TABLE 1. Sensor range and necessary span check gas cylinder are also listed. Refer to FIGURE 1 to identify all kit components.

GAS TYPE	RANGE	SPAN GAS PRESET VALUES	MSA RP CYLINDER P/N
NITROGEN DIOXIDE	0-10 PPM	5 PPM	710332
CHLORINE	0-5 PPM	2 PPM	710331
HYDROGEN CHLORIDE	0-100 PPM	40 PPM	710210
CHLORINE DIOXIDE*	0-3 PPM	1 PPM	710331
ZERO GAS	20.8% O ₂	---	479857

*CL₂ IS CALIBRATED WITH CL₂ OR USE CL₂ CALIBRATOR KIT (P/N 710420)

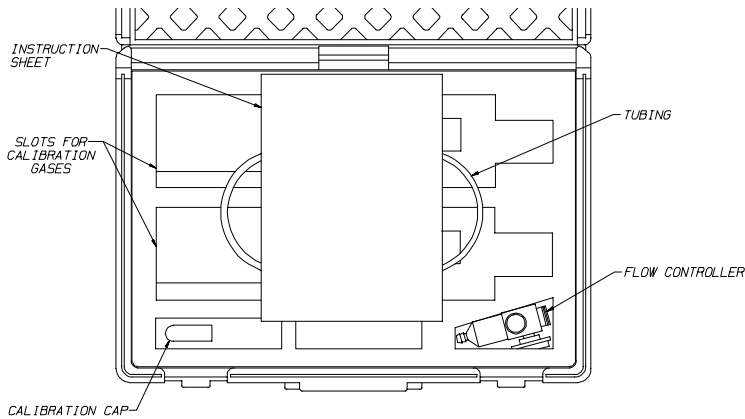


Figure 1. Kit Components

Ultima Gas Monitor Calibration Guidelines

As with any gas monitor, the only true performance check is to apply gas directly to the sensor. The calibration procedure should be performed regularly and a log kept of calibration adjustments. More frequent calibration may be required when the unit is new. Calibration frequency depends on instrument operating time and chemical exposures. Also perform calibration when installing or changing the power source of the control instrumentation.

To Zero the Ultima Gas Monitor Only

In some cases, it may be necessary to perform only a zero function of the Gas Monitor in lieu of a full zero and span procedure. Check with your safety officer or engineer to determine if only a zero function is necessary.

⚠ CAUTION

To ensure a fully functional sensor, perform complete calibration checks and adjustments at initial start-up and at regular intervals.

1. Connect a cylinder of zero gas, or install the Kit calibration cap over the end of the Ultima Gas Monitor sensor inlet (FIGURE 2). Wait two minutes.

2. Point the Ultima Controller or Calibrator at the Ultima Gas Monitor display, and press the ZERO Button.

The display shows:

- Countdown from 30 to 0 seconds
- **APPLY ZERO GAS** Flag (FIGURE 3)

After the 30-second countdown:

- Display alternates between "CAL" and a value (e.g.: 0 PPM). These values (ppm, % and % gas) are pre-determined by the type of sensor installed
- Once this *same* value alternates consecutively with "CAL" for 15 seconds, the display shows **END** and the zero value (FIGURE 4).

3. Remove zero gas or calibration cap. Ultima Gas Monitor zeroing is complete

NOTE: The Ultima Gas Monitor allows adjustment only within a pre-defined range. Adjustments outside of this range are not accepted (for example: applying an empty or wrong cylinder of gas or failing to begin gas flow within the allotted 30 seconds during countdown). In these cases, the Ultima Gas Monitor:

- Displays **CAL FAULT** Flag (FIGURE 5) to indicate:
- Someone unsuccessfully attempted to zero or calibrate the Ultima Gas Monitor
- The Monitor is operating within the calibration parameters defined before the calibration attempt

NOTE: The only way to extinguish the **CAL FAULT** Flag is to perform a complete and successful calibration procedure.

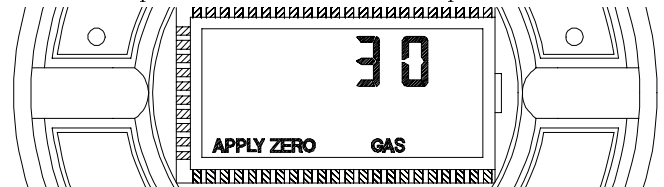


Figure 3. Apply Zero Gas Flag

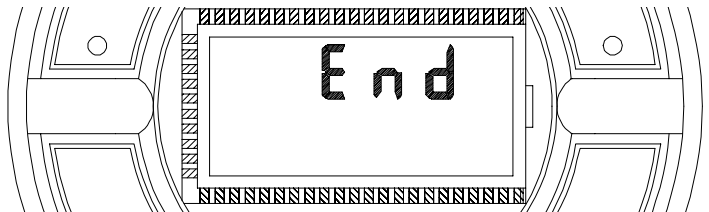


Figure 4. Calibration End Display

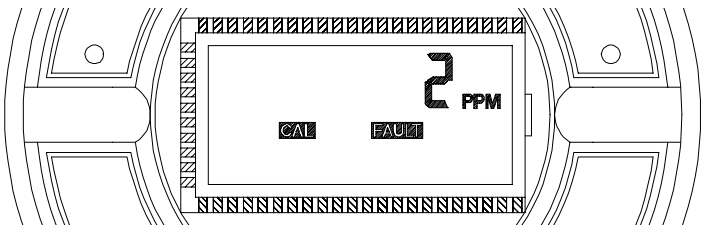


Figure 5. Calibration Fault Flag

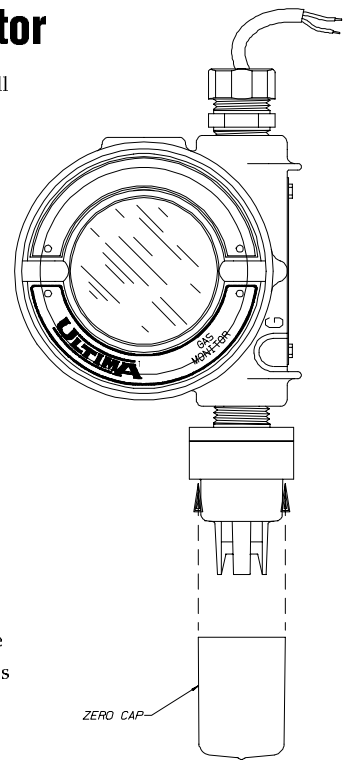


Figure 2. Calibration Set-up

Perform a Complete Calibration of the Ultima Gas Monitor

ZERO

NOTE: If this is the first calibration after the sensor element is replaced, refer to *INITIAL Calibration*.

1. Connect the SPAN gas cylinder and tubing as shown in FIGURE 6 when not using zero gas. **Do not turn on the flow controller.** Wait two minutes.
2. At the ready prompt, point the Ultima Controller or Calibrator at the Ultima Gas Monitor display and press the **CALIBRATE** Button. The Display shows:
 - Countdown from 30 to 0 seconds
 - **APPLY ZERO GAS** Flag (FIGURE 7)

After the 30-second countdown:

- Display alternates between "**CAL**" and a value, such as **0 ppm**

Once this *same* value alternates consecutively for 15 seconds, the display shows (FIGURE 2-4):

- **END** and
- Zero concentration of unit selected (**ppm, % or %LEL**)

3. The Ultima Gas Monitor is now zeroed. Do not remove the cylinder or tubing from the unit.

NOTE: The Ultima Gas Monitor allows adjustment only within a pre-defined range. Adjustments outside of this range are not accepted (e.g.: applying an empty or wrong cylinder of gas or failing to begin gas flow within the allotted 30 seconds during countdown). In these cases, the Ultima Gas Monitor:

- Displays **CAL FAULT** Flag (see FIGURE 5) to indicate:
 - Someone has unsuccessfully attempted to calibrate the Ultima Monitor
 - The Ultima Monitor is operating within the calibration parameters defined before the calibration attempt

NOTE: The only way to extinguish the **CAL FAULT** Flag is to perform a *complete* and successful calibration procedure.

SPAN

NOTE: If this is the first calibration after the sensor element is replaced, refer to *INITIAL Calibration*.

4. The Ultima unit automatically begins the span procedure after the zero procedure. The display shows:
 - Countdown from 30 to zero seconds
 - **APPLY SPAN GAS** Flag (FIGURE 8)
5. For CL₂, CLO₂, NO₂ and HCL: Turn on the flow controller on the span gas cylinder. After the 30-second countdown:
 - Display alternates between "**CAL**" and the concentration value found (for example: **2 ppm** for 0 to 5 ppm CL₂)

Once the same concentration alternates consecutively with "**CAL**" for 15 seconds, the display shows (see FIGURE 4):

- **END** and
- SPAN concentration and unit selected (**ppm, % or %LEL**)

No adjustments are necessary.

6. Remove the span gas.
 - The Ultima Gas Monitor is now completely calibrated
 - If the calibration signal is enabled during calibration, it will be held at the lock-out value for two minutes
 - A slight up-scale reading may occur after span gas and calibration cap are removed. The reading will return to a normal level in a short time; this temporary up-scale fluctuation does not affect the actual calibration or readings.

NOTE: The Ultima Gas Monitor allows adjustment only within a pre-defined range. Adjustments outside of this range are not accepted (for example: applying an empty or wrong cylinder of gas or failing to begin gas flow within the allotted 30 seconds during countdown). In these cases, the Ultima Monitor:

- Displays **CAL FAULT** Flag (FIGURE 5) to indicate:
 - Someone unsuccessfully attempted to calibrate the Ultima Monitor
 - The Ultima Gas Monitor is operating within its *original* calibration parameters

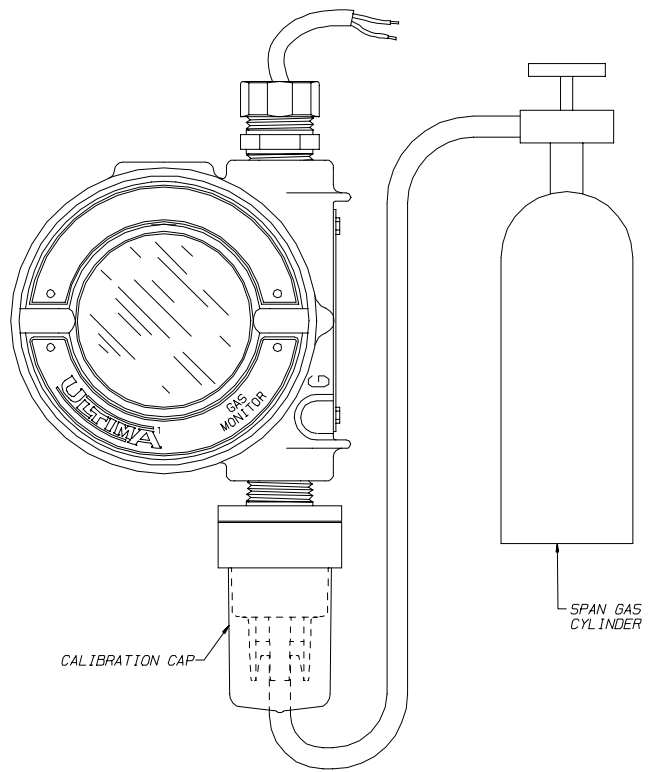


Figure 6. Calibration Set-ups

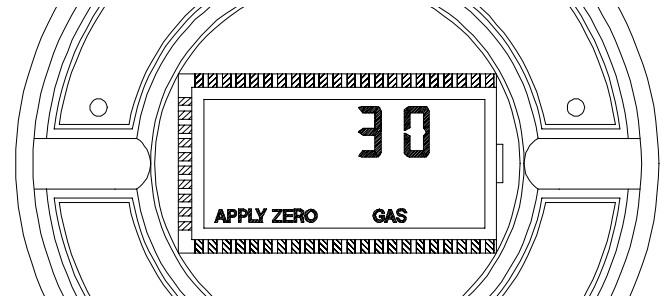


Figure 7. Apply Zero Gas Display

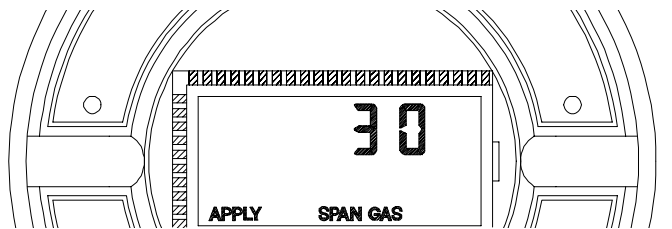


Figure 8. Apply SPAN Gas Flag

NOTE: The only way to extinguish the **CAL FAULT** flag is to perform a *complete* and successful calibration procedure.

INITIAL Calibration

When a new sensor element is placed in the sensor, an *Initial Calibration* must be performed. This procedure enables the unit to gather data about the sensor to make accurate decisions for the **CHANGE SENSOR** function and the **CAL FAULT** function to work properly.

Consult your Ultima Controller instruction manual or Ultima Calibrator instruction manual for details.