# 3M ™ Multi-Gas Detector 950 Series – Calibration

Calibration of the unit should be performed every 30 days or immediately if it does not pass the bump test. Factors such as age of the sensor and exposures to very high concentrations of gas may require the sensor to be calibrated more frequently. The following procedure is also the same one that is used on all sensors except the Metal Oxide Sensor (MOS) and the single Oxygen Sensor (OX).

**To calibrate the four "standard" sensors (OX, EX, CO, HS):**

a) Go to a non-contaminated environment to perform the calibration.
b) Choose the appropriate certified gas by matching the sensors with the gas mixtures noted in the user instructions.
   NOTE: A four-gas certified calibration mixture is available from 3M using methane as the combustible gas (**3M Part Number 933-000-023** in a 34 L cylinder).
c) Turn on the unit and allow it to warm up.
d) Press and hold the CAL/NO button for 3 seconds while observing the LCD, release the button when indicated by the LCD.
e) Press the PEAKS and then CAL/NO buttons when indicated by the LCD (this will stop the pump from operating if this option was active).
f) The LCD will then display the dates when the sensors were last calibrated and ask if you wish to "ZERO SENSORS?" It is recommended that you do so.
g) Press the CAL/NO button if you wish to by-pass a zero calibration, note that this will bypass the oxygen sensor calibration.
h) Press the POWER/SELECT/YES button to accept zero calibration. The oxygen sensor is calibrated during the zeroing operation so avoid breathing into the detector during this operation as you could affect the oxygen level being detected by the OX sensor.
i) The zero calibration timer will run for 25 seconds and at the conclusion of the test the LCD will ask if you wish to do a "BUMP TEST?"
j) To bypass the bump test press the CAL/NO button.
k) The LCD will then display "QUICK SPAN?" Press the POWER/SELECT/YES button to initiate the second half of the calibration operation.
l) The LCD will display the message "WAITING FOR GAS" and will show the gas concentrations that are expected for methane (EX), carbon monoxide (CO), and hydrogen sulfide (HS) sensors.
m) A countdown timer starts that allows time to connect the certified calibration gas hose.
n) Place the calibration hood/pump hood over the sensors.
o) Secure it tightly with the retaining screws.
p) Attach a hose from the correct calibration gas bottle to the gas inlet of the detector.
q) Turn on the valve and ensure the gas flow rate is between 0.2 and 0.5 liters per minute.

r) At the conclusion of the waiting for gas period and assuming the gas was connected in time, the LCD will then change to "SPANNING" and a further 150 second countdown timer is started.
s) If the optional 5th sensor installed, the LCD will ask if it is to be spanned.
t) If this is not desired, press "CAL/NO" to bypass the 5th sensor span.
u) After the span is completed the LCD will display the new values and a numeric span value will be given for each sensor, a span range from 35 to 250 is acceptable for operation of the detector.
v) Turn off the valve and disconnect the calibration gas prior to pushing the last button (to avoid a "PUMP STALL ALARM").
w) Press "POWER/SELECT/YES" to return to normal operation.

**To calibrate a single sensor:**

a) Any single sensor can be calibrated.
b) If you are using a single oxygen sensor, follow the directions for zeroing the detector (as previously shown).
c) For all other sensors follow the directions for calibrating the detector (as previously shown) except:
    a. At the conclusion of zeroing the LCD will ask if you wish to do a "BUMP TEST?"
    b. Press the CAL/NO button until the single sensor you wish to calibrate is displayed.
    c. Press POWER/SELECT/YES button to choose the sensor to be calibrated.
    d. The LCD will display the message "WAITING FOR GAS" and will show the gas concentration expected for the sensor.
    e. A countdown timer starts that allows time to connect the certified calibration gas hose.
    f. Place the calibration hood/pump hood over the sensors.
    g. Secure it tightly with the retaining screws.
    h. Attach a hose from the correct calibration gas bottle to the gas inlet of the detector.
    i. Turn on the valve and ensure the gas flow rate is between 0.2 and 0.5 liters per minute.
    j. The remainder of the calibration operation is the same as previously shown.
    k. A span range from 35 to 250 is acceptable for operation of the detector.