How to calibrate the formaldehyde sensor within a PPMonitor Wireless Unit:

Please read this document thoroughly before attempting to check or adjust the calibration of the formaldehyde sensor within the PPMonitor Wireless unit. Follow these instructions carefully during the procedure.

It is advisable to check calibration regularly and re-calibrate when necessary due to sensor sensitivity changing very gradually with time.

A calibration check can be carried out by drawing a known concentration of formaldehyde vapor into the sensor. The result displayed should correspond to the expected concentration value in the calibration table. If there is more than a 5% deviation to the expected concentration a re-calibration of the PPMonitor IAQ unit is required.

Picture 1

The PPMonitor Wireless unit is supplied complete with: a formaldehyde calibration standard, Calibration Unit with 9v PP3 battery, and a length of polythene tubing. These are essential components for checking and adjusting calibration of the formaldehyde sensor within the PPMonitor Wireless unit.

Preparation for Calibration & Checking Calibration

It is recommended that a calibration check or adjustment be carried out at the approximate operational temperature of the sampling environment.

The following items have been supplied and are essential to calibrate the PPMonitor Wireless unit see Picture 2.

- 1 Calibration Unit with 9v PP3 battery.
- 1 valid Calibration Standard (not exceeded the expiry date on the tube)
- A bag containing a length of polythene tubing for the nozzle

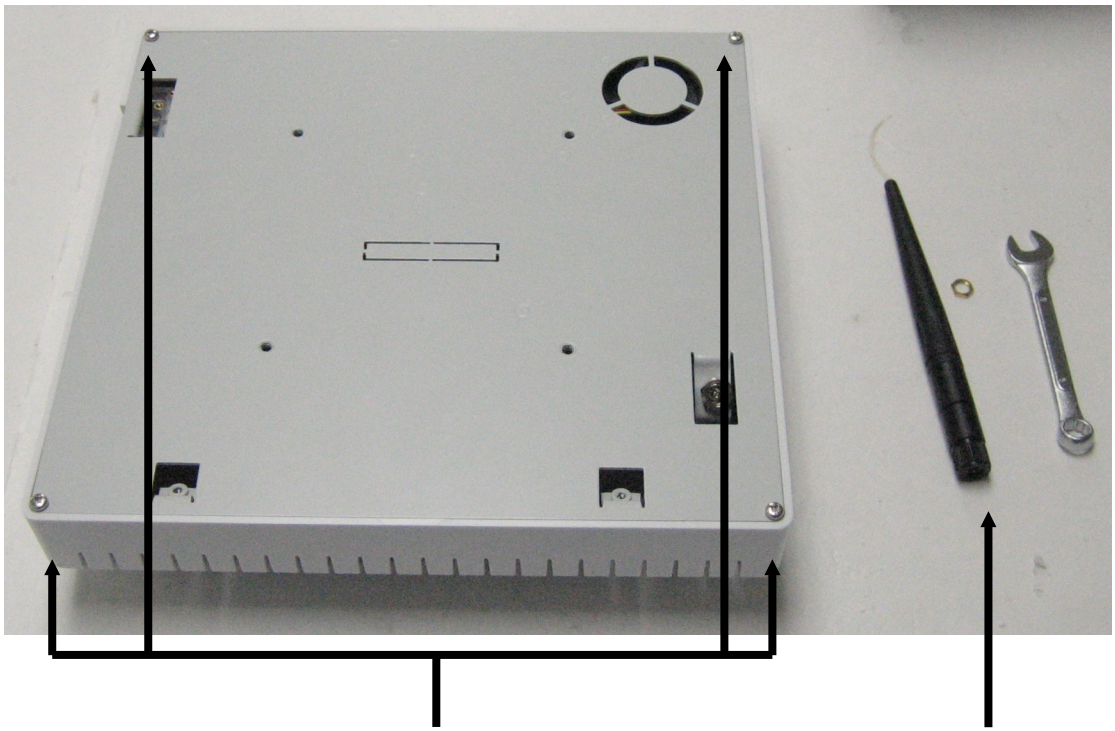
Picture 2

The white outer case of the PPMonitor Wireless Unit will need to be removed to check or calibrate the formaldehyde sensor.

Warning: Before removing the white outer case, please ensure that all mains power has been removed.

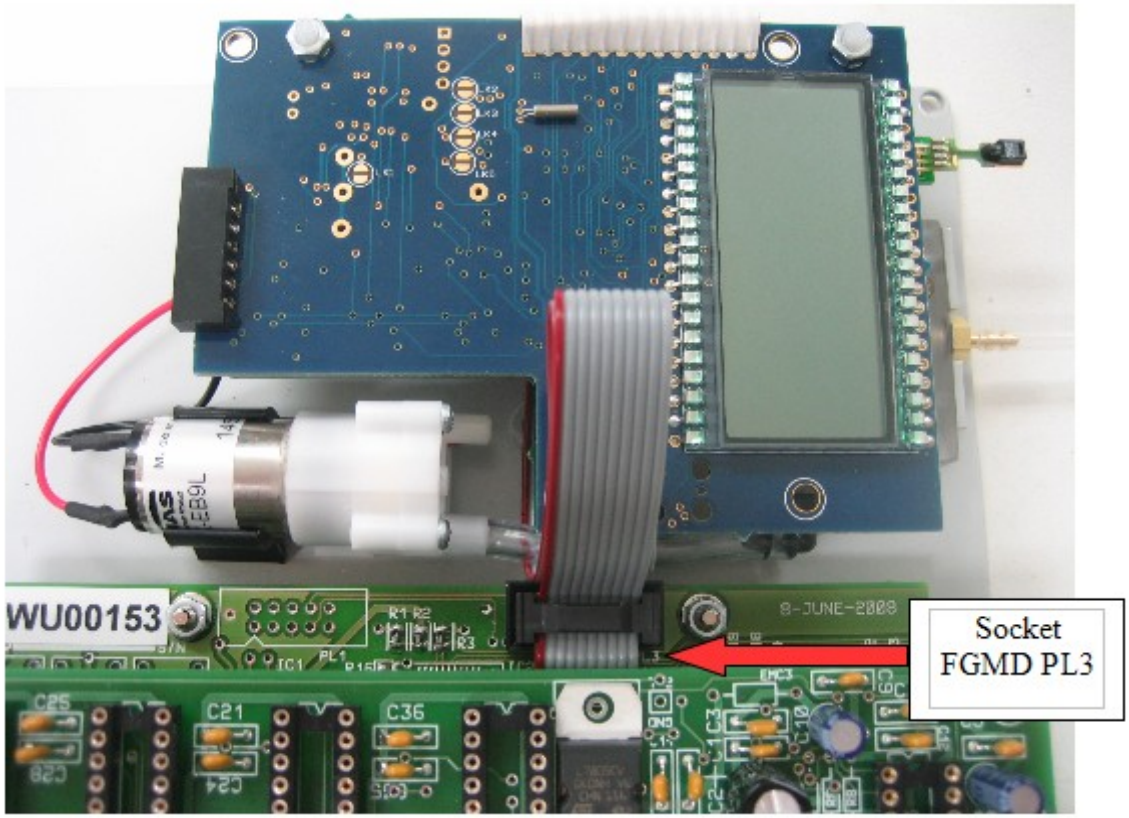
Before calibration or checking calibration, please ensure that the PPMonitor Wireless Unit is switched off or the mains power has been removed from the unit. The calibration unit will supply the required power for the calibration / calibration check.

Picture 3

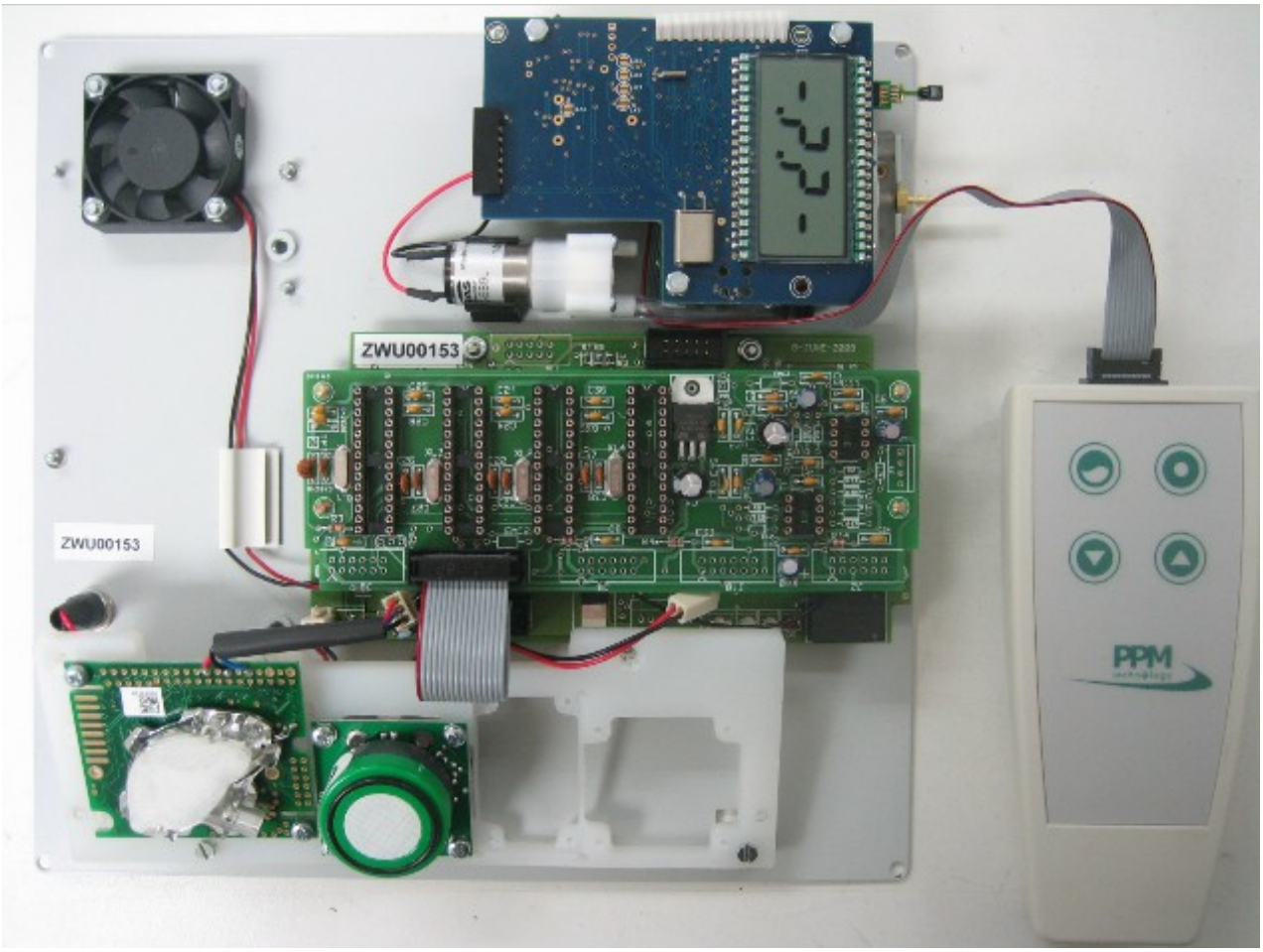


To remove the white case you will first need to remove the aerial. The black part of the aerial should screw off by turning it. You will also need to remove the brass nut at the base of the aerial. This can be done with a size 8 spanner. After this you can remove the 4 screws using a flat or pozi screwdriver. Keep all removed parts in a safe place as you will need them to reassemble the case.

Picture 4



Remove the FGMD cable from socket PL3 (location identified by the grey arrow in picture 4 on last page). Connect the cable (10 way) to the Calibration unit. The connectors on each end of the 10 way ribbon cable are polarized and will only slot in each socket the correct way.



NOTE - Remember to re-connect the cable to socket PL3 after calibrating and before replacing the cover.

Only use the supplied calibration unit (with corresponding serial number) with your IAQ units. Do not use with any other calibration unit. If you are unsure about what type of calibration unit and board you have do not hesitate to contact PPM Technology.

Formaldemeter Calibration Unit

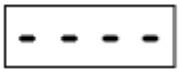
The calibration unit should act as a normal Formaldemeter keypad, with the four buttons representing the same four buttons on the Formaldemeter.

Note – Users of the PPM Formaldemeter™ 400, htV or htV-M will notice the four buttons on the Calibration Unit represents the same functions as those on the front of the hand held Formaldemeter. The screen on the Formaldemeter part of the PPMonitor Wireless Unit will display the same details as those on the screen of the Formaldemeter.

****Before calibrating the instrument it is recommend that you implement the Calibration Check Procedure shown below****

1. Temperature equilibration: Place the formaldehyde calibration standard and a thermometer as close as possible to the PPMonitor IAQ Unit, leave to equilibrate for at least one hour, i.e. to allow thermal equilibration. For best result calibrate the formaldehyde sensor in the actual sampling area. However, if this is not possible calibration should be carried out in conditions as close as possible to the operational temperature i.e. temperature of the atmosphere being sampled during monitoring.

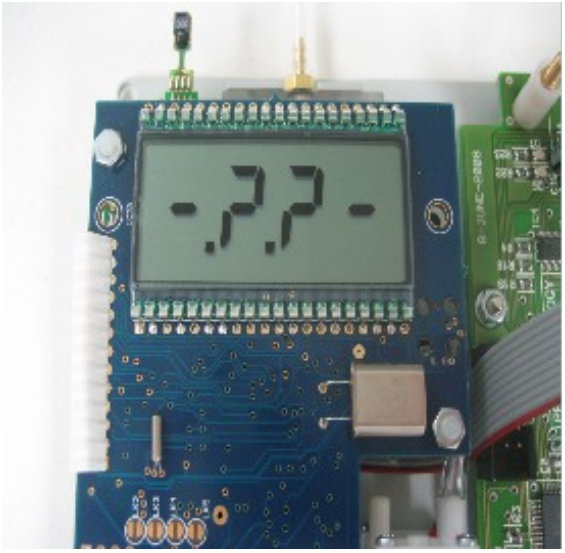
2. Sensor clear check: Switch the formaldehyde unit on with the calibration unit. The display will show four flashing dashes for a couple of seconds,



followed by

Between samples, the formaldehyde unit should be left switched off for a few minutes to allow the sensor to clear of any residual formaldehyde. As a general rule, the higher the reading obtained, the longer it takes for the sensor to clear. The above display will indicate that the sensor has cleared and monitor is ready

The formaldehyde unit is now ready to check calibration or to calibrate.



Press the On-Off button to turn on the unit.

For new style Formaldemeters when

"-.?.?-" appears on the screen, the instrument is in the Off state.

Procedure:

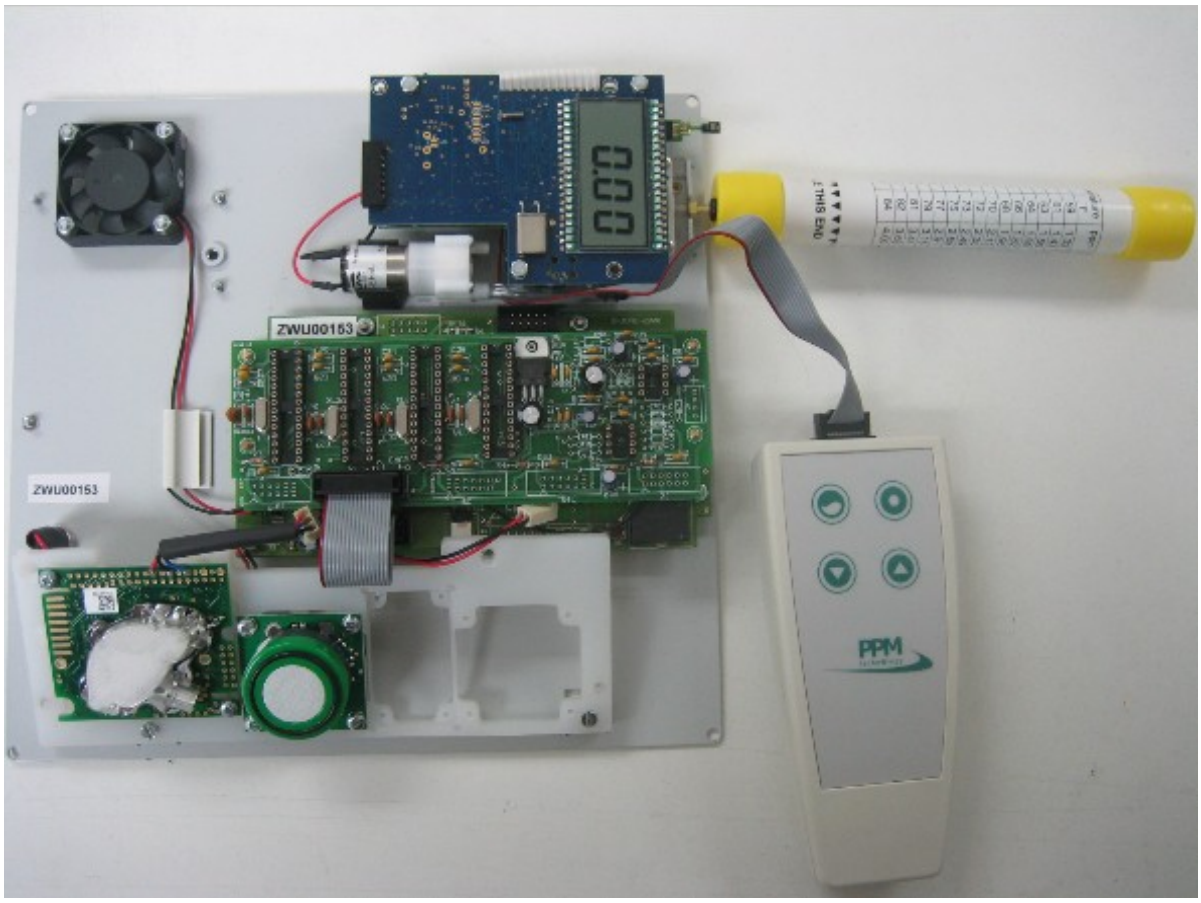
1. The calibration standard with the thermometer should have completed thermal equilibration as instructed in the previous section. Handle the calibration standard as little as possible, using the yellow end caps to avoid heating the tube. **Remove both end plugs**.

2. Switch the instrument on by pressing the ON-OFF button once. Wait for the display to show:

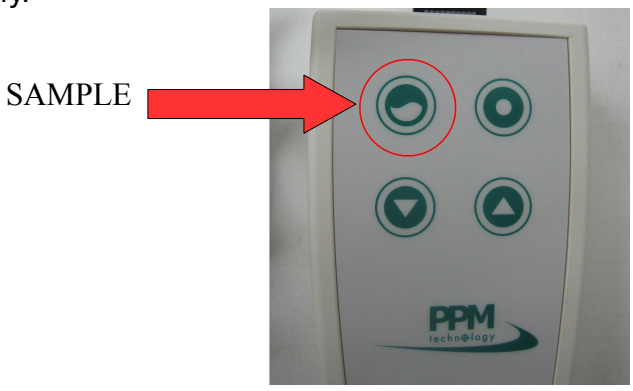
3. Insert one end of the supplied 20mm tube into the sampling nozzle of the formaldehyde unit.

The other end should be gently pushed into the black seal of the calibration standard sampling end. Done correctly a good seal will be achieved.
See picture 5:-

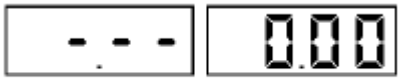
Picture 5



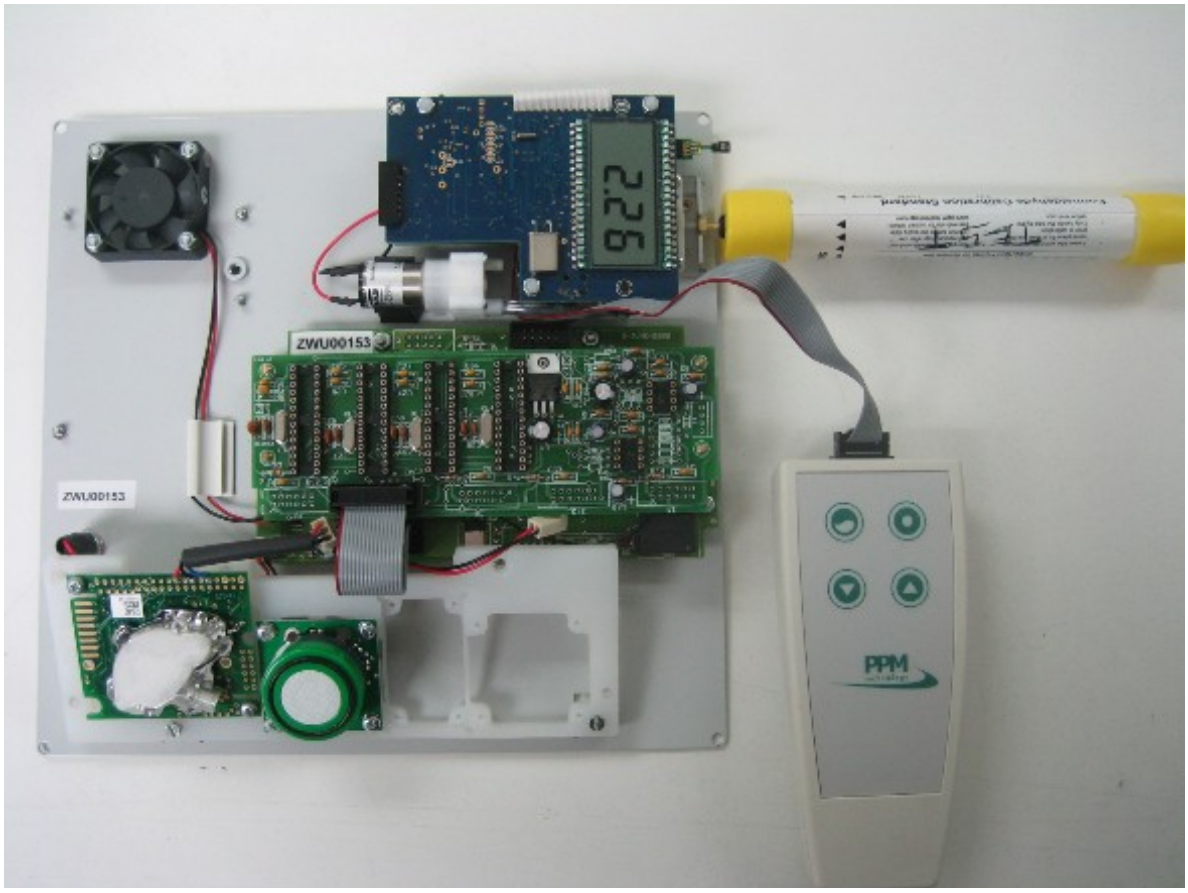
4. Press ‘sample’. The pump will be heard drawing a vapor sample. When the pump stops, remove the tube from the calibration standard & replace the plugs securely.



5. The display will flash between the following two screens for 10 seconds:



6. The display will then show a flashing “-.--” on the screen. After 60 seconds, the display will show a non-flashing value, which is held until the instrument is switched off. This indicates the formaldehyde concentration in ppm.



7. Refer to the Temperature/Concentration look-up table on the standard tube. If the reading is within 5% of the value shown in the table, then no recalibration is required.

8. If recalibration is required, follow the Calibration Adjustment Procedure on the next page. Leave the instrument switched off for approximately **5 minutes** to recover before commencing another atmospheric analysis or calibration adjustment.

Calibration Adjustment Procedure:

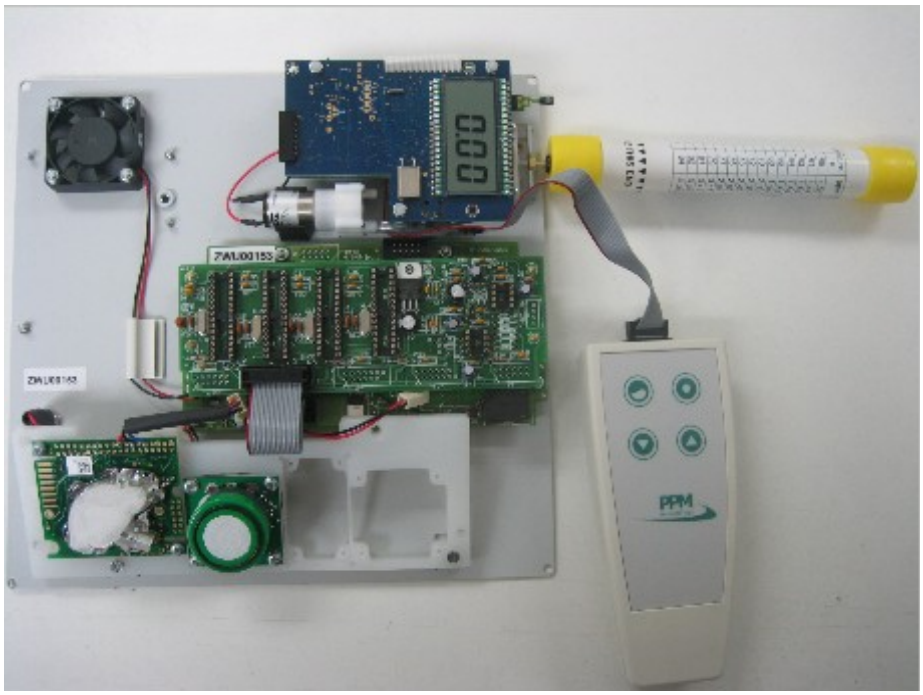
1. The calibration standard with the thermometer should have completed thermal equilibration as instructed in the preparation for calibration or check calibration. Handle the calibration standard as little as possible, using the yellow end caps to avoid heating the tube. Remove both end plugs.

2. Press the ON-OFF button once to switch the instrument on.

3. Wait for the display to show:

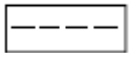
4. **Remove the yellow plugs from both ends** of the calibration standard.

5. Insert the sampling end of the calibration standard (indicated by the black arrow) into the tube. Ensure a good seal.



6. Simultaneously depress and release both ‘Cal’ buttons.

7. The pump will be heard drawing a vapor sample and will then flash:



8. When the pump stops, remove the calibration standard and replace securely both yellow end plugs.

9. The display will show a flashing value for 60 seconds, followed by:

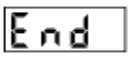
10. Read the temperature on the thermometer and determine the required concentration reading from the lookup table on the calibration standard, for example:

Temperature: 21°C
Reading: 2.13 ppm

11. Now use the Cal < and > buttons to adjust the display reading to the required concentration i.e. in the example this would be 2.13.

12. Press the SAMPLE button to store this calibration value. The display will show:

followed by:



The Formaldemeter will switch off automatically.

13. The formaldehyde unit has now been re-calibrated however it is advised to check the calibration in approximately **5 minutes** using the Calibration Check Procedure. Repeat the calibration procedure if incorrect.

14. Once the calibration has been confirmed correct, disconnect the calibration unit from the formaldehyde unit.

15. Ensure to re-connect the cable to socket PL1. Replace the cover, tighten the four screws and make sure the cover has been replaced securely.

16. Power can now be re-connected to the PPMonitor Wireless Unit. Wait until the PPMonitor programme has started and the graph screen displayed and wait until a reading is obtained from each sensor.

Other routine checks that can be performed to the formaldehyde sensor unit.

Other tests for checking the performance of the Formaldehyde electrochemical sensor are also available. This can be done before disconnecting the Calibration unit from the Wireless PPMonitor Unit.

The Wireless PPMonitor unit has two calibration GAIN values, the normal peak value and the Area GAIN value. The GAIN value indicates the performance output of the fuel cell.

Obtaining GAIN Values:
The normal Peak GAIN can be displayed by pressing the Press CAL < & ON simultaneously.

A message '**gAIN**' is displayed briefly. The first four-digit Gain value should be between 3300 & 6000. The second part of the gain value (in the form E=17) should be between E16 and E18. If the instrument is totally un-calibrated, the reading will be 1638 E 16.

The Area GAIN can be displayed by pressing SAMPLE, CAL > & ON simultaneously.

A message '**ArEA GAIN**' is displayed briefly. The first four digit Gain value should be between 3300 & 6000. The second part of the gain value (in the form E=23) should be between E 23 and E 25. If instrument is totally un-calibrated, the reading will be 3276 E 23.

If the Gain Values on the Wireless PPMonitor Unit complies with the above, then it can be concluded that formaldehyde sensor is in good working order.

You will then need to switch off the FormaldemeterTM htV. The instrument has now been recalibrated. It is advised that you check the calibration in 5minutes using the Calibration Check Procedure.

The other sensors in the PPMonitor Wireless will also need to be checked and calibrated. Please contact PPM Technology or your local distributor for further details.