PPM Formaldemeter™ htV

3 Parameter IAQ Monitor

Operation Manual

www.ppm-technology.com

PPM Technology Ltd • Cibyn Industrial Estate • Caernarfon • Gwynedd • LL55 2BD • Wales • UK
Telephone: +44 (0)1286 676 999 • Fax: +44 (0)1286 671 811 • E-mail: info@ppm-technology.com
Registered in Wales: 3743347 • VAT Number: GB 713 750 842 • ISO 9001 2015 Registered Firm
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1 INTRODUCTION

The PPM Formaldemeter™ *ktv* is an easy-to-use, hand held, three-parameter, indoor air quality monitor designed for the rapid measurement of airborne formaldehyde levels, along with temperature and humidity readings. The monitor is capable of displaying formaldehyde readings in both parts-per-million (ppm) and milligrams-per-cubic metre (mg/m^3) and has built-in data analysis functions to compensate for high humidity readings, that can act as interference to the instrument's readings.

This operating manual will provide you with all the necessary information for the correct use of your Formaldemeter™ *ktv*.

Please read these instructions carefully and familiarise yourself with the instrument before use.

1.1 Initial Receipt of the PPM Formaldemeter™ htl Kit

Your PPM Formaldemeter™ htl kit has been packaged carefully and includes all the components necessary for full operation. Immediately upon receipt, please examine the kit contents carefully to ensure that you have received the items listed below and that they are all in good condition.

Component list

The instrument kit contains:

- **Formaldemeter™ htl instrument with battery**
- **Formaldehyde Calibration Standard**
- **Vial of Filters (10)**
- **Ball point pen**
- **Certificate of Calibration**
- **This Operation Manual**
- **Quick Guide**

Damage

Inspect all items carefully: any damaged or missing items must be reported immediately to both the carrier and your dealer.

1.2 General Description

Unlike other formaldehyde monitoring devices such as colour stain tubes and badges, the Formaldemeter™ htl is capable of measuring many samples consecutively without the need for inconvenient ancillary equipment. Being compact and battery operated, the instrument is truly field portable. The Formaldemeter™ htl is also extremely simple to use and provides immediate, semi-quantitative readings of atmospheric formaldehyde concentrations in both ppm and mg/m^3.

The Formaldemeter™ htl is designed to measure the concentration of formaldehyde in snatch (discrete) samples of air and should be employed primarily as a screening device.

Important points

It is important that you are aware of the following points when using the instrument:

- **The Formaldemeter™ htV is temperature compensated to operate most accurately in the range 15-29°C and 40–60%RH.**
- **The results obtained with the PPM Formaldemeter™ htV are instantaneous readings: a single reading is not necessarily representative of long-term personal exposure. A series of readings taken at short intervals is preferable to infrequent tests.**
- **Avoid smoking in the environment to be analysed: tobacco smoke contains aldehydes which will interfere with the readings.**
- **Care must be taken to ensure that fluid or dust is not drawn into the instrument. This could permanently damage the sensor.**
- **The Formaldemeter™ htV has been designed to be sufficiently robust for everyday field use. However, should the unit sustain a severe physical shock, the operation and calibration of the instrument should be checked using the supplied formaldehyde Calibration Standard.**

1.3 Instrument Features

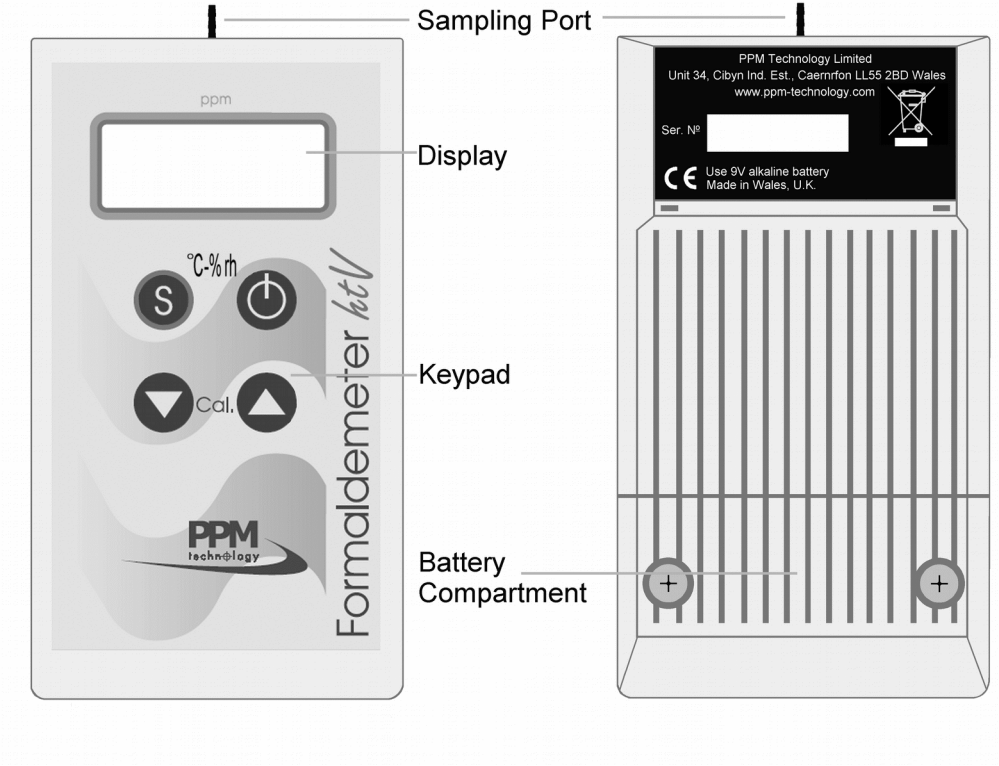


Fig 1.1 Instrument Diagram

Sampling Port — **The brass sampling port is the inlet through which the sample is drawn into sensor.**

Battery Compartment — **The battery compartment is located beneath a cover at the rear of the instrument. See Section 6.1 for guidance on battery replacement.**

Keypad — **Four buttons operate the instrument; some of which have multiple functions when used in combination. The buttons are:**

⏻ : On-Off

Ⓢ : Sample or select

▼ and ▲ : Move to next item or adjust current setting.

Display

The LCD shows the formaldehyde concentration and also text messages during certain operations:

----	***Sensor recovering***
0.00	***Sensor ready***
run	***Sampling***
ALt=	***Alternative result***
CAL	***Taking calibration sample***
SEt	***Set calibration level***
bAt	***Replace battery***
ttP ...Lo	***Fuel cell needs hydrating***
SEt ... CAL	***Instrument not calibrated***

2 TECHNICAL INFORMATION

2.1 Principle of Operation

Electrochemical Formaldehyde Sensor

The PPM Formaldemeter™ htV uses proven electrochemical sensing technology for determining the concentration of formaldehyde in air samples. The instrument contains a formaldehyde sensor formed from two noble metal electrodes and a suitable electrolyte.

When air is drawn into the sensor by the internal sampling system a small voltage is produced as a result of the oxidation of formaldehyde at one of the catalytically active electrodes. This voltage is directly proportional in magnitude to the concentration of formaldehyde in the sample.

The voltage is amplified and converted to a digital signal for a microprocessor which in turn manipulates the signal to give a result on the instrument display in ''parts-per-million by volume'' (ppm). The microprocessor also converts the result to ''milligrams-per-cubic metre'' (mg/m^3) and stores the results to non-volatile memory.

All the electronic systems are based on modern, integrated circuitry employing the latest surface mount technology to ensure that the Formaldemeter™ htV is an exceptionally robust and reliable instrument.

2.2 Interference

Alcohols & Aldehydes

As with other portable detection equipment, the meter is not totally specific to formaldehyde alone. The instrument is susceptible to interference from a small range of other chemicals. Other aldehydes and alcohols such as methanol and ethanol in the atmosphere can cause cross-interference effects.

A list of common chemicals that can cause interference can be found in Appendix C or from the manufacturer on request.

Phenol & Resorcinol

The presence of phenol in the air can also cause cross-interference on the Formaldemeter™ htV. When monitoring formaldehyde in situations where phenolic resins are used, the filters provided should be used. The filters will completely remove phenols and other compounds from the sample at concentrations in excess of 1000 ppm without affecting the formaldehyde reading.

Filter Life

These fit on to the sampling port of the instrument. Each filter should be used no more than ten times and then discarded. Partially used filters should not be stored in the vial with unused filters. Replacement filters can be ordered from PPM Technology or through your local distributor.

Sensor Background Reading

Due to the high sensitivity of the sensor a background reading can often be produced even when sampling in an atmosphere considered to be free of interference.

Humidity Extremes

As the sensor is very sensitive, it is possible that extremes of humidity (generally, anything outside the 40–60% R.H. range) may cause a background reading on Formaldemeter instruments. The Formaldemeter™ htV is specially designed to compensate for this problem by using the humidity sensor and built-in data analysis functions.

3 USING THE PPM FORMALDEMETER™ *ktV*

3.1 Taking a Sample

Power on

Press the ⏻ button once to turn the instrument on. The following display will flash ---- for 3 seconds as the instrument checks the sensor background.

After this a steady 0.00 display indicates that the instrument is ready to take a sample.

Sampling

Hold the instrument in the atmosphere to be sampled and press the Ⓢ button once to start sampling. The display will show run and the internal pump should be heard running for almost two seconds as it draws air into the instrument.

Display Reading

As the sample is analysed, the display will flash between -.-- and 0.00 for 10 seconds and then stay on -.-- for the remainder of the sample. After 60 seconds, the display will show the final reading until the instrument is switched off. This indicates the formaldehyde concentration in ppm.

Other Readings

Pressing the ▼ button after a sample will show the time taken for the concentration to be analysed.

Pressing the ▲ button after a sample will show the reading in mg/m^3, alternating with the ALt- message.

Power off

Press and hold the ⏻ button until the display shows OFF and then release the button. If you forget to switch the instrument off after a sample the PPM Formaldemeter™ *ktV* will automatically

switch itself off after 5 minutes.

3.2 Sensor Recovery Period

Sensor Clearing

Between samples the instrument should be left switched off 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.

If the instrument is switched on before the sensor has cleared, the pump will not operate and the display will flash the ---- message.

The cell is clear and ready to take the next sample when a steady 0.00 is showing on the display.

If the instrument does not clear after approximately 5 minutes then refer to Section 7 for help.

4 CALIBRATION CHECK AND ADJUSTMENT

Please read this section thoroughly. Users are strongly advised to familiarise themselves with the instrument before attempting to adjust the calibration and should follow the instructions carefully.

4.1 General Information

Check Calibration Regularly

Instrument sensitivity can change gradually over time and periodic recalibration may be required. It is advisable to check the calibration regularly to ensure that the instrument continues to function correctly.

A check can be carried out by drawing a sample of known concentration into the instrument's sensor and noting whether the displayed reading agrees with the expected concentration.

It is recommended that calibration check and any subsequent calibration adjustments be carried out at the approximate operational temperature as the environment to be sampled. This will improve sample accuracy.

4.2 The Formaldemeter Calibration Standard

The PPM Formaldemeter™ *htV* is initially supplied complete with a Formaldehyde Calibration Standard, which is essential for checking and adjusting the calibration. The Calibration Standard consists of formaldehyde saturated substrate in a glass tube from which a head-space vapour sample can be drawn. Each standard is carefully manufactured to a high tolerance.

Effect of Temperature

The optimum operating temperature for the instrument is 15-29°C.The concentration of formaldehyde vapour generated in the Calibration Standard increases with increasing temperature and it is for this reason that a temperature table is printed on the Calibration Standard. An accurate thermometer is required to measure the temperature to determine the vapour concentration.

To reduce the effect of body temperature the Calibration Standard should only be handled by the yellow end caps.

The Calibration Standard and instrument should always be allowed to stabilise within the sampling environment for at least one hour before use.

Calibration Standard Expiry

Each Calibration Standard may be used for either a maximum of 6 months, indicated by the expiry date written on each one, or a maximum of 100 samples; whichever occurs first.

New calibration standards can be ordered from PPM or through your local distributor.

4.3 Calibration Check Procedure

Temperature Equilibration

Place the instrument, a thermometer and Calibration Standard together in a location where the temperature is stable for at least one hour before commencing the calibration check procedure to allow thermal equilibration.

Sensor Check

Before carrying out a calibration check, the sensor must be clear of formaldehyde vapour from any previous samples. See Section 3.2 for further details.

Procedure

1. Switch the instrument on by pressing the ⏻ button once. Wait for the display to show 0.00

2. Place the Calibration Standard and thermometer on a work surface. Remember to handle the Calibration Standard by the yellow end caps to avoid heating the tube. Remove both end plugs.

3. Insert the instrument nozzle into the sampling end of the Calibration Standard (refer to *fig 1.2*). To ensure a good seal around the instrument nozzle apply gentle pressure to Calibration Standard against the instrument when taking a sample.

4. Press the Ⓢ button and wait until the internal sampling pump stops before removing the standard

from the instrument. Replace the end plugs in the Calibration Standard securely.

5. Wait for the sample to complete and the concentration to be displayed. Refer to Section 3.1 for details.

6. Refer to the look-up table printed on the Calibration Standard and use the thermometer reading to find the expected concentration. If the displayed reading is within 5% of the value shown in the table, then no recalibration is required. Otherwise follow the procedure in Section 4.4.

Leave the instrument switched off for at least 5 minutes to recover before commencing another atmospheric analysis or calibration adjustment, for more details see Section 3.2.

4.4 Calibration Adjustment Procedure

To see whether a full recalibration is required, perform a calibration check first, as described in Section 4.3.

Temperature Equilibrium

Place the instrument, a thermometer and Calibration Standard together in a place where the temperature is stable for at least one hour before commencing the calibration check procedure to allow thermal equilibration.

Sensor Check

Before carrying out a calibration check, the sensor must be clear of formaldehyde vapour from any previous samples. See Section 3.2 for further details.

Procedure

1. Switch the instrument on by pressing the ⏻ button once. Wait for the display to show 0.00

2. Place the Calibration Standard and thermometer on a work surface. Remember to handle the Calibration Standard by the yellow end caps to avoid heating the tube. Remove both end plugs.

3. Insert the instrument nozzle into the sampling end

of the Calibration Standard (refer to *fig 1.2*). To ensure a good seal around the instrument nozzle apply gentle pressure to Calibration Standard against the instrument when taking a sample.

4. Simultaneously press both ▼ and ▲ buttons. The pump will be heard drawing a vapour sample and the screen will briefly show CAL. Release the buttons.

5. When the pump stops, remove the calibration tube and replace both yellow end plugs.

6. The display will show an increasing, flashing value for 60 seconds, followed by SEt and 2.000 alternating.

7. Refer to the look-up table printed on the Calibration Standard and use the thermometer reading to find the required calibration value. For example, at 21°C the Calibration Standard gives a calibration value of 2.13 ppm.

8. Now use the ▲ or ▼ button to adjust the display reading to the required concentration. In our example we would use ▲ to set 2.130 on the display.

9. Press the Ⓢ button to store the calibration value. The display will show CAL followed by End .

The Formaldemeter™ htV will then switch off automatically and the calibration procedure is complete.

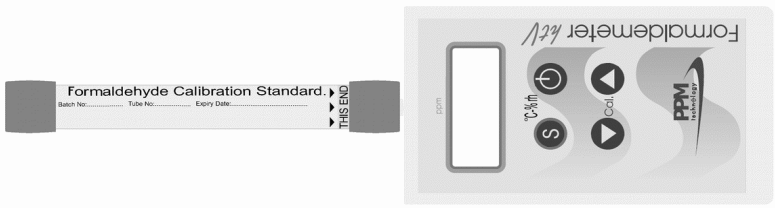


Fig 1.2 Formaldemeter™ htV with Calibration Standard Inserted

5 ADDITIONAL FEATURES

5.1 Temperature & Humidity Sensor

Reading the Current Temperature & Humidity

1. Hold down the Ⓢ whilst turning the instrument on. The display will show HERE, release all the buttons.

2. The instrument will then show the current temperature in degrees Celsius on the display followed by °C.

3. The instrument will then display the current relative humidity in % followed by %rH.

4. These four displays will cycle until the instrument turns itself off after 30 seconds or is manually turned off with the ⏻ button.

The sensor used for these readings is located next to the sampling port. Avoid touching the sensor when the instrument is in use.

The sensor is accurate to within ±3.0% for relative humidity and ±0.4°C for temperature (within the operational limits for the instrument).

5.2 Limit Setting

This setting governs how quickly the instrument takes to clear before another sample can be taken. The default limit setting for the Formaldemeter™ ktV is ''1'', which means that the fuel cell must be very stable before the instrument allows the user to take another sample. There are a total of four limits available.

To change the limits used the instrument must first be Re-Set as described in Section 7. After changing the limits the instrument must be calibrated as described in Section 4.4.

Changing the Limits

Holding down the Ⓢ and ▲ buttons whilst turning the instrument on will enter the configuration menu: ConF will be shown on the display, release all the buttons. Step through the menu by pressing the Ⓢ button until you reach the Lt- entry.

Using the ▲ or ▼ buttons, change the limit setting as required. Press the Ⓢ button to confirm the new setting and move on to the next menu item. Following this either turn the instrument off with the ⏻ button or the instrument will automatically switch itself off after approximately 30 seconds.

If you see [] when attempting to alter the setting then you must Re-Set the instrument first. See Section 7.

Limit 1 : LE- 1 — **Default setting for Formaldemeter™ *ktV*.**

Limit 2 : LE-2 — **Glutaraldemeter® mode – do not use.**

Limit 3 : LE-3 — **Used if the Formaldemeter™ *ktV* is regularly sampling concentrations of formaldehyde in excess of 2ppm, allowing the instrument to sample at more regular intervals than if the default Limit Setting were used.**

Note that when using Limit Setting 3 low concentration readings are less accurate as some residual formaldehyde from the previous sample may still be present in the sensor.

Limit 4 : LE-4 — **Used in the ''extended range'' Formaldemeter™ *ktV*. Please contact the manufacturer regarding this setting as changing the limit to ''4'' may require additional changes to the instrument settings and hardware.**

5.3 Data Retrieval

The PPM Formaldemeter™ *ktV* has sufficient memory capacity to log the last 10 concentration samples in both ppm and mg/m³.

Accessing the Data

1. Hold down the Ⓢ button whilst turning the instrument on. The instrument will display the HEAt **message (as described in Section 5.1). Release all the buttons.**

2. Now press both ▼ and ▲ to view the saved data. The display will briefly show dAtA **to confirm this.**

3. The display will then alternate between showing the saved sample number and the saved concentration in ppm. The samples are shown from the most recent (run0**) to the oldest (**run9**).**

4. Use the ▼ or ▲ buttons to change the display to the desired sample reading.

5. Press the ⓢ button to view the saved concentration in mg/m³ rather than ppm. The display will change from run to ALt to confirm this.

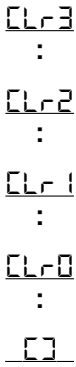
6. Press and hold the ⏻ button to exit the display mode and turn the instrument off.

Clearing the Memory

To delete all the saved samples from the memory enter the data viewing mode as described above and then hold down both the ▲ and ▼ buttons.

This will start the deletion process, you must keep both buttons pressed as the display shows a count-down to complete the deletion.

The count-down will be:



Once [] is displayed the memory has been deleted.

The instrument returns to displaying run0 and 0.00

6 MAINTENANCE

With the exception of the battery, the Formaldemeter™ ktV has no user-serviceable components. No attempt should be made to open the instrument other than to replace the battery: any evidence of tampering with the instrument will invalidate the warranty.

If you find that your instrument requires service or repair, please contact PPM Technology or your local dealer.

Cleaning the Instrument

On no account should the Formaldemeter™ ktV be immersed in liquid. Any liquid entering the instrument will destroy the sensor and the electronic circuitry. Never use abrasive or solvent based cleaning agents as this could damage the instrument.

If the instrument requires cleaning use a damp cloth only.

Storage

When not in use, your Formaldemeter™ ktV should be stored in the supplied carrying case in a clean, dry environment and away from extremes of temperature. If it is being stored for long periods the battery should also be removed to avoid leakage.

6.1 Instrument Battery

The instrument requires a 9V PP3 / MN1604 / 6LR61 type alkaline battery. Take care to observe the correct polarity when inserting a new battery.

Low Battery Indicator

When the battery voltage becomes too low and needs replacing the, display will flash bAt.

Battery Replacement

To access the battery, remove the battery compartment cover at the rear of the instrument. Please consider the environment when disposing of old batteries: Make use of your local recycling facilities.

7 TROUBLESHOOTING

Display Flashes ---- and the Instrument Will Not Sample

The three main reasons for this problem are:

1. The instrument has been accidentally calibrated when no Calibration Standard was present.

2. The Calibration Standard used for calibration has expired.

3. The instrument has been damaged and will need to be repaired.

To determine which of these reasons applies carefully follow the procedures shown below.

Please note that quoted results and values are for tests performed at 25°C, if in doubt contact the manufacturer.

1. Make sure that the instrument has been turned off for about 5-minutes.

2. Hold down the ▼ button whilst turning the instrument on. The display will show tESt. Release all the buttons.

3. A four-digit value will appear: 0.123. Give the instrument a few seconds to stabilise.

4. Note the initial value and an approximate rate of change over a minute.

If the initial value or the rate of change was in excess of 0.300 then it is likely that your sensor has been damaged – contact PPM Technology or your dealer for further details, otherwise continue with the instrument still in the tESt mode:

1. With the sample nozzle inserted into a valid Calibration Standard press the Ⓢ button to take a sample (see Section 4.3).

2. The display should show 0.000 as the pump starts to run and rise up to a maximum as the sample is

drawn in. Wait for the value on the screen to reach a peak and then start to drop.

3. Press and hold the ▼ button – the display will show the time taken for the value to reach it's peak in seconds: t 5.6. Make a note of this time.

4. Press and hold the ▲ button – the display will show the peak value: 5.432. Make a note of this peak value.

5. Turn the instrument off by holding down the ⏻ button. Leave the instrument off for 5-minutes before repeating the tests, attempting to calibrate or taking another sample.

If the peak value recorded was less than 5.000 or the time value recorded was less than t 5.0 then there may be a problem with the sampling system or the sensor. Contact PPM Technology or your dealer for further details.

Display Shows ttP Lo after switching ON

Known as 'Low Time To Peak', this is due to the internal electrochemical fuel cell having dried out. This problem can occur if the unit is being used to sample in a very dry climate or environment. The fuel cell will need to be hydrated to clear this message.

To hydrate the fuel cell, you will need to use a Sensor Refresh Standard (available from PPM Technology and some distributors).

The pump run time of the instrument will need to be increased (10 to 20 seconds depending on instrument and firmware version) by following the steps detailed below:

1. Reset the instrument. This is detailed on the following page.
2. Turn the instrument off. Once off, hold down both ▲ and ▼ buttons and the Ⓢ button and switch the unit on. If done correctly, you should see OPEr displayed

on screen.

3. Press the Ⓢ button to navigate down to the setting listed as SP:AL, note the value (e.g. 1.4 seconds) and change it to 20 seconds (you may only be able to select 10 seconds depending on the age of the instrument).

4. Continue to press Ⓢ to navigate through the rest of the menu system until the instrument switches off.

Now that the pump run time has been increased, simply place the Sensor Refresh Standard over the brass nozzle of the Formaldemeter and take several long samples. You may need to repeat this procedure depending on how low the Time-to-Peak Value is.

Once completed you will need to return the instrument pump setting back to the original value noted in Step 3 above and recalibrate the Formaldemeter.

If the instrument is still displaying this message, please contact PPM Technology for further help.

Checking Calibration Gain

1. Hold down the ▲ button whilst turning the instrument on. GAIn will appear on the display. Release all the buttons.

2. A four-digit value will alternate with a two-digit exponent on the display: 4321 and E:17, for example.

3. Make a note of both numbers. The instrument will turn off after a few seconds.

If the Exponent value is between E:15 and E:13 then you may have used an expired Calibration Standard – check your Calibration Standard expiry date.

If the Exponent value is less than E:13 you may have accidentally calibrated without a Calibration Standard being present.

In either case, carry out a Re-Set as described below. You will then need to calibrate the instrument as described in Section 4.4.

Performing a Re-Set of the Instrument

Make sure that you have a valid Calibration Standard to hand before performing this procedure as your current calibration will be deleted, and there is no way of 'undoing' the Re-Set once it has been completed.

1. Hold down both ▼ and ▲ buttons whilst turning the instrument on: rSEt will appear on the display. Release all the buttons.

2. Next, -no- will appear on the display. To continue with the Re-Set press ▲ to change the -no- to a YES and then press the Ⓢ button.

3. rSEt will appear on the display again and the instrument will restart. The Re-Set is now complete.

Because the Re-Set deletes the calibration information from the instrument the display will flash the SEt and CAL message each time it's turned on. This warning will be removed when the instrument is correctly calibrated, refer to Section 4.4.

If, after a Re-Set, you are still experiencing problems then contact PPM Technology or your distributor to arrange a service.

8 ACCESSORIES

Mounting Systems

Several options for mounting the Formaldemeter™ htV are available, including a desk mount for display purposes, and a wall mount for more permanent monitoring.

Rubber Sleeve ‘‘Blue Boot’’

Protective case.

For more details on these and other accessories please contact PPM Technology or your local distributor.

9 WARRANTY

Please register your instrument online to activate your Warranty. See inside front cover more information.

The PPM Formaldemeter™ htl is warranted to be free of defects in materials and workmanship under proper and normal use and service for a period of one year from the date of purchase. This warranty is limited to repair or replacement (at the manufacturer's discretion) of any part that proves defective in material or workmanship under normal use and service, provided the product is returned to PPM Technology Limited. Please register your instrument online, see inside front cover for details.

All shipment charges should be pre-paid when returning products to PPM Technology Limited and should be accompanied by a valid and recognised RMA number and Returns Cover Sheet issued by PPM Technology Limited.

Damage due to defacement, misuse, tampering, lack of prescribed maintenance or use in violation of the instructions furnished by PPM Technology Limited is not covered by this warranty.

This warranty is in lieu of all other warranties, express or implied, including but not limited to merchantability or fitness for a particular purpose. In no event shall PPM Technology Limited be liable for any incidental or consequential damages of any nature arising from the use of the product.

PPM Technology Limited reserves the right to make changes at any time to this document and shall not be liable for errors that may appear in it. PPM Technology Limited also reserves the right to alter the design, construction, appearance and specifications of its products without notice.

Appendix A : WEEE and RoHS Declarations

Waste Electronic and Electrical Equipment (WEEE) Declaration

As a manufacturer of electronic equipment, PPM Technology Ltd. is responsible for the collection, treatment, recycling and recovery of all of our electrical equipment placed on the market within the UK, at the end of their lifetime. Please note that the ''crossed out wheelie bin'' symbol is displayed on all our electrical equipment.

PPM Technology Ltd. WEEE from the UK should be returned to PPM Technology for suitable disposal.

Restriction of use of certain Hazardous Substances (RoHS) Declaration

In compliance to the RoHS directive we declare that our products do not contain more than maximum permitted levels of Lead, Mercury, Hexavalent Chromium, Polybrominated Biphenyls (PBBs) and Polybrominated Diphenyl Ethers (PBDEs).

Appendix B : Formaldehyde Calibration Table and Equation

Temperature	Concentration
15°C	1.324 ppm
16°C	1.433 ppm
17°C	1.550 ppm
18°C	1.678 ppm
19°C	1.815 ppm
20°C	1.964 ppm
21°C	2.126 ppm
22°C	2.300 ppm

Temperature	Concentration
23°C	2.589 ppm
24°C	2.693 ppm
25°C	2.914 ppm
26°C	3.154 ppm
27°C	3.412 ppm
28°C	3.693 ppm
29°C	3.996 ppm

$$\text{Concentration} = e^{(0.0789 \times \text{Temperature})} \times 0.4054$$

Appendix C :
List of Common Interferences

Please note that interference factors will differ from sensor to sensor and with sensor use over it's lifetime. This table is only a guideline. Do not attempt to calibrate with cross interfering gases.

Please be aware that ozone causes formaldehyde to be broken down into carbon dioxide, water and oxygen; therefore, in ozone rich environments, formaldehyde levels can be reduced.

Filters are extremely efficient at removing phenol from the sample, along with some other alcohols and aldehydes.

Note that the filters reduce the concentration of formaldehyde by around 15% so should only be used in conditions where there are suspected interferences and the instrument should be calibrated with the filter in place. See Section 2.2 for more information.

Compound	Equivalent to 1ppm reading	Filter Efficiency	Notes
ACETALDEHYDE	12ppm	60%	
ETHANOL	24ppm	45%	
FORMALDEHYDE	1ppm	12%	
FORMIC ACID	26ppm	100%	Removed by filter.
GLUTERALDEHYDE	7ppm	70%	
METHANOL	52ppm	15%	
PHENOL	8ppm	100%	Removed by filter.
RESORCINOL	250ppm	100%	Removed by filter.

A wide range of suspected interfering gases have been tested, including (NH3, CO, CO2, NO2, Acetone & Isobutylene), and the table shows only those which caused interference below LEL levels at 25°C.
Unless noted otherwise all responses are linear.
Compiled by PPM technology Ltd. for Formaldemeter sensor, February 2015.