PhoCheck+ 1, 2, 3 & 5000Ex
User Manual V1.1

Declaration of conformity

Safety Rating

This instrument conforms to the ATEX directive. it has been assessed by BASEEFA (2001) and approved to BSEN 50014:1998, BSEN 50020:2002 standards having the following certification: -

⟨Ex⟩ II 2 G EEx ia IIC T4 BASEEFA 03ATEX0742

-20°C ≤ Ta ≤ +60°C

This intrinsic safety rating, permits its deployment in all hazardous areas of the quoted (or less demanding) rating. That is, in areas where explosive gases (of Group IIA, IIB and IIC) are intermittently present (Zone 1), within an ambient temperature range of -20°C and +60°C.

PhoCheck+ complies with the requirements of 73/23 EEC low voltage directive and, apart from a low voltage pump, there are no moving parts within the instrument so that the machinery directives are not applicable.

This instrument has been designed under and complies to:
BS EN 61010-1:2001 (IEC 61010-1:2001) Safety requirements for electrical equipment for measurement, control and laboratory use.

EMC Emissions and Immunity

This gas detector has been tested to the following standards:
BSEN61000-6-3:2001 and BSEN61000-6-1:2001, July 2004, and found to comply.

Manufactured Quality Assurance

PhoCheck+ has been designed in compliance with ISO9001:2000, which ensures that the equipment supplied to our customers has been designed and reproducibly assembled from certified drawings using traceable safety components.

Technical Director

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Statements

Responsibility For Use

PhoCheck+ instruments detect a large range of gases, which are potentially dangerous from both a poisoning and/or an explosive perspective. PhoCheck+ instruments have many adjustable and selectable features allowing the detector to be used in a variety of ways.

Ion Science Ltd can accept no responsibility for the incorrect adjustment of features that cause harm or damage to persons or property.

PhoCheck+ can be used as a personal safety device. It is the user's responsibility to respond appropriately to an alarm situation.

! WARNINGS !

1. For reasons of Intrinsic Safety, batteries <u>MUST NOT</u> be charged or replaced within potentially flammable areas. Ensure you are in a SAFE area before carrying out any type of maintenance on the PhoCheck+ Instrument.
2. Substitution of components may impair intrinsic safety and result in unsafe conditions.
3. For safety reasons, the PhoCheck+ must only be operated and serviced by qualified personnel.
4. Please read and understand this User Manual fully before operating or servicing the PhoCheck+.

! CAUTION !

It is essential that the PhoCheck+ is always used with a supplied PTFE 0.5 micron filter fitted to the front of the instrument. The PhoCheck+ internal pump draws over 200 ml/min of air into the instrument and without a filter; particles of debris and dust will be drawn into the cell inhibiting the correct function of the instrument. These filters are consumable and should be changed every 100 hours of use. The frequency of replacement should be increased for dusty or moisture laden environments. Filters are available for purchase from Ion Science; see our accessories page (pg 46) for more information.

Statements

Quality Assurance
PhoCheck+ has been designed in compliance with ISO9001:2000, which ensures that the equipment supplied to our customers has been designed and assembled reproducibly, from traceable components, and leaves Ion Science calibrated to stated standards.

Disposal
Dispose of PhoCheck+, its components and any used batteries in accordance with all local and national safety and environmental requirements. This includes the European WEEE (Waste Electrical and Electronic Equipment) directive. Ion Science Ltd offers a take back service. Please contact us for more information.
The PhoCheck+ field case material is recyclable polypropylene.

Calibration Facility
Ion Science Ltd offers a calibration service including the issue of certification confirming calibration with equipment traceable to UK national standards.
A PhoCheck+ Calibration Kit is available from Ion Science to allow a two-point calibration to be carried out in the field as a custom calibration. However Ion Science does recommend the annual return of all instruments for a yearly service and calibration.

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Introduction to PhoCheck+

PhoCheck+ is a portable gas detector, suitable for the detection of a large range of Volatile Organic Compounds (VOC's), which are dangerous from both a poisoning and explosive perspective. Total VOC's are detected using PID (Photo Ionisation Detection) technology.

The PhoCheck+ versions are fully upgradeable in the field (i.e. PhoCheck+ 1000 to a 5000 or a 2000 to a 3000 etc). Also available is the option to upgrade to the FirstCheck+ multigas range of instruments upon return of your instrument to Ion Science. Please see page 48 for more details relating to upgrade options.

PhoCheck+ has two principle modes of operation, Health & Safety and Survey mode.

Health & Safety mode is used to check for conformity of short-term exposure levels (STEL) or time-weighted averages (TWA) that are specific for particular hazardous environments (for example EH40 in the UK and OSHA in the USA). In this mode of operation STEL's and TWA's are continually calculated and compared to levels set in the instruments gas table.

Survey is the default mode of operation whenever the Health & Safety mode is NOT selected. This mode is often used in applications where several areas (or Zones) are to be monitored and readings data logged. All sensor readings are real time measurements and alarm levels are set manually.

For more information on these modes of operation please see page 25.

PhoCheck+ versions 2000, 3000 and 5000 automatically data log the instruments readings every second. These readings are stored in the instrument's memory with a date and time stamp. For more information please see page 17.

Getting started

Packing List

Please take a little time to check the contents in the PhoCheck+ case.

Item	Description	Qty.
1.	PhoCheck+ instrument	1
2.	PID lamp (fitted)	1
3.	Probe - 100mm (fitted)	1
4.	PTFE filter - 50 micron (fitted)	1
5.	Battery charger (if rechargeable type)	1
6.	Battery clip (if non-rechargeable)	1
7.	Screw driver (if non-rechargeable)	1
8.	Manual	1
9.	IonPC software CD	1
10.	IS Protective Cover	1
11.	Cal Kit Sample containing:	

- PID lamp cleaning Kit (Includes alumina powder and 2 applicators for 1 clean)   1
- Carbon canister   1
- PTFE filter – 50 micron   1
- Cal adaptor*   1
- Lamp removal tools (neoprene sleeves)   2

* Please note that the Cal adaptor is to be used in conjunction with a PhoCheck+ Calibration Kit accessory (part number A-845213). **WARNING:** when fitting the Cal adaptor onto the gas tube (part of the Calibration kit) ensure that the small breather hole of the Cal adaptor is not covered as this will cause the instruments internal pump to be damaged beyond repair. You warranty will be invalidated if the pump is damaged in this way.

Removing the PhoCheck+ from its case

Carefully remove the PhoCheck+ instrument from its case being careful not to damage the filter and probe assembly. 'Luer' type connectors are used to connect the PhoCheck+, filter and probe together and require a quarter-turn ONLY to connect / disconnect them. Do not over tighten.

To avoid drawing dust or particulate matter into the detector cell we suggest always fitting the filter with the Ion Science logo facing away from the instrument, therefore dust only collects on the same one side of the filter and is not inadvertently drawn into the instrument if the filter is attached the other way round.

Getting started

Setting alarm levels

We recommend that alarm levels are set to user specifications as soon as possible before being used for the first time. Please see page 19 for details of how to set alarm levels.

Setting date and time

We recommend that the correct local date and time be set to the instrument as soon as possible before being used for the first time. Please see page 23 for details on how to set the date and time.

Selecting a gas from the internal gas table

PhoCheck+ instruments leave Ion Science pre-set for gas type TVOC (total volatile organic compounds). Instruments are factory calibrated against isobutylene and all response factors are equivalent to this. By changing the gas from the gas table all readings will be given using that gases response factor. To change the selected gas please see pages 23 & 24.

Rechargeable Batteries

Although PhoCheck+ instruments leave the factory fully charged, prolonged periods of storage may result in the battery pack discharging. We suggest charging the instrument for 12 hours before use. See the battery section of this manual page 38.

Alkaline Batteries

Fit the battery pack supplied with the PhoCheck+. For more information please see the battery section of this manual page 38.

Instrument Functions

<u>**Keypad function descriptions**</u>

On/Off.

To switch the PhoCheck+ instrument 'ON' - Press the 'ON/OFF' key. To switch the PhoCheck+ instrument 'OFF' - Ensure you are on the 'Display/Function Selection screen' or a Display screen. Press and hold the 'ON/OFF' key. A 'Timer' symbol will appear and a line will travel across the bottom on the screen, release the 'ON/OFF' button once the line has travelled the length of the screen. The 'Delay' symbol will briefly appear before the instrument turns 'OFF' completely. This procedure has been designed to avoid accidental switch OFF.

Delay Symbol

ENTER
This key selects options and confirms settings.

ESCAPE
This key is used to return the display to the previous screen and to abort an adjustment. Repeated pressing of this key will return the display to the 'Display/Function Selection screen'.

UP
Use to scroll up or changes selection

DOWN
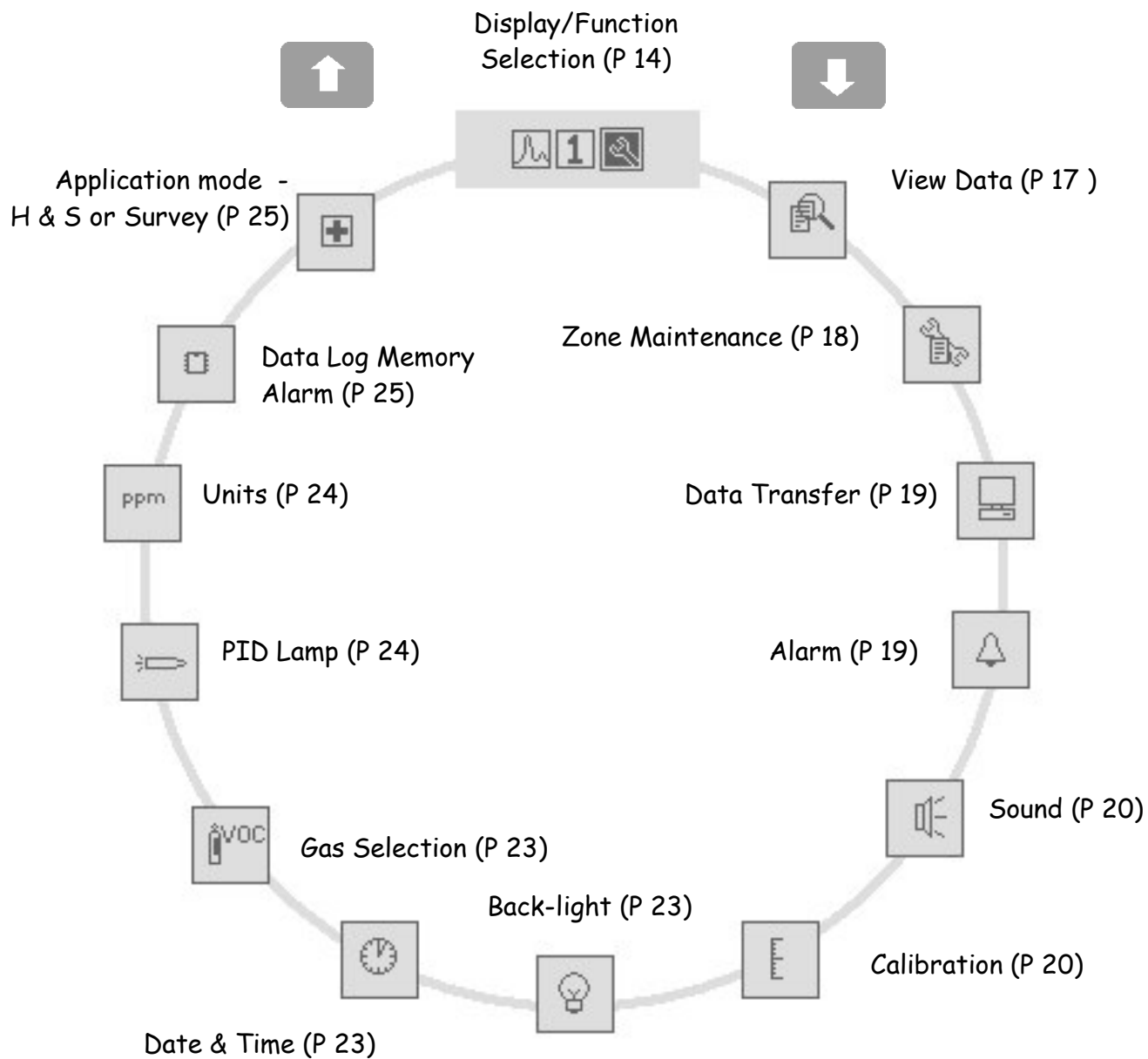Use to scroll down or changes selection

ZERO
Zero's the detector when on 'Display Screen' (Only applicable in survey mode see page 15 for more information).
Caution: Should the PhoCheck+ instrument be taken from a cold to warm environment, condensation may form on internal parts of the detector cell. Under these conditions prolonged measurement errors may appear as unusually high background levels, even in a clean air environment. To compensate for this error, press and hold the 'ZERO' key for at least two seconds.

Instrument Functions

Function locations

Display/Function
Selection (P 14)

Application mode -
H & S or Survey (P 25)

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Zone Maintenance (P 18)

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Date & Time (P 23)

From the 'Display/Function Selection' screen highlight the function menu
icon then press 'Enter', use the 'Up/Down' keys to view the available
functions then press 'Enter' to select the function options

<u>Instrument Functions</u>

<u>How the PhoCheck+ Menu Works</u>

Once in the function menu with the function-symbol you require on the screen press the 'Enter' key to select it. (See Figure 1.)

Fig 1

A cursor (highlighted symbol or number) can be moved from one selection to another by using the 'UP' and 'DOWN' keys. (See Figure 2.) Pressing 'Enter' will cause the selection to flash. When flashing use the 'UP' and 'DOWN' keys to adjust it.

Fig 2

When you have adjusted the parameter to an acceptable level press the 'Enter' key. The adjusted parameter will be stored. In many cases a tick (✓) will appear to confirm the action.

Although there is a variation in complexity of some functions, this basic concept of selection, adjustment and confirmation is common throughout this instrument.

You can abort a selection by pressing the 'Escape' (Esc) key.

Quick Reference

This quick reference indicates which functions are relevant to which instruments.

1 = PhoCheck+ 1000   2 = PhoCheck+ 2000   3 = PhoCheck+ 3000   5 = PhoCheck+ 5000

Display/Function Selection   **1, 2, 3, & 5** (Page 14)

Allows the user to view detected VOC levels in either graph or number format and to adjust the instrument functions and parameters.

View Data   **2, 3 & 5**   (Page 17)

Allows viewing of stored data in the instruments internal memory.

Zone Maintenance   **2, 3 & 5**   (Page 18)

Allows the creation, selection and deletion of Zone names.

Data Transfer   **1, 2, 3 & 5** (Page 19)

Enables data transfer between instrument and PC/laptop.

Alarm   **1, 2, 3 & 5** (Page 19)

Allows the adjustment of upper and lower Alarm levels in survey mode.

Sound   **1, 2, 3 & 5** (Page 20)

Allows the selection of audible indicators including a confidence beep.

Calibration   **1, 2, 3 & 5** (Page 20)

Allows the selection of Factory or Custom calibration.

Quick Reference

Back-light   **1, 2, 3 & 5 (Page 23)**
Allows the selection of back-light options.

Date / Time   **2, 3 & 5   (Page 23)**
Allows the adjustment of the date and time.

PID Gas Selection   **1, 2, 3 & 5 (Page 23)**
Allows the selection of gases from the internal gas table.

PID Lamp   **2, 3 & 4   (Page 24)**
Allows the selection of different PID lamps.

Units   **1, 2, 3 & 5 (Page 24)**
Allows the selection of ppb, ppm or mg/m^3 as measurement units.

Data log Memory Alarm   **2, 3, & 5   (Page 25)**
Allows the setting of an alarm to warn the user when the data logging memory is full.

**Application**   **3 & 5 (Page 25)**
Allows the selection of modes of operation, 'Health and Safety' for STEL and TWA monitoring or 'Survey' for general use. The PhoCheck+ 1000 & 2000 instruments do not have Health & Safety mode as standard and are Survey instruments only, however Health and Safety mode is an upgradeable feature.

Instrument Displays

Display/Function Selection Screen

The 'Display/Function Selection screen' is shown when the PhoCheck+ is switched on and can always be located by repeatedly pressing the 'Esc' (Escape) key. The 'Display/Function screen' allows the user to view detected gas levels in a variety of formats or to adjust the instruments functions and parameters. The symbols shown on this screen can be selected using the UP and DOWN keys. The highlighted symbol appears as shown in the example below for the function menu.

Graph Screen   Large Number Screen   Function menu
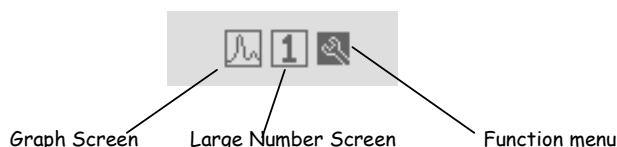
Instrument Symbols Explained

A number of symbols are used to indicate various features when in the viewing screens. Please see an explanation of each below.

Bump test

A symbol of a gas bottle can be set via the IonPC software. It is displayed once a week when the instrument is turned on to remind the user to test the instrument response. See page 32 of the software section for more information.

Battery Status

Charged

Discharged

The battery status indicator can be accessed by pressing and holding Enter on the graph and the large number screens.

Peak Hold

The numerical measurement to the right of this symbol indicates the highest gas concentration reached by the instrument since being switched ON. This 'Peak' reading can be reset by pressing and holding the 'Enter' key for 5 seconds.

Instrument Displays

Background Zero Reference

Relative
Absolute

When in 'Survey' mode pressing the 'Zero' key alternates between 'Relative' and 'Absolute' modes. There is a constant level of detectable gas in ambient air, which is detectable with PhoCheck+. 'Absolute mode' displays the entire sensor signal. 'Relative' mode 'removes' the background signal and sets the 'Zero' point at an artificial level.

Detected signal
Relative Zero
Absolute Zero
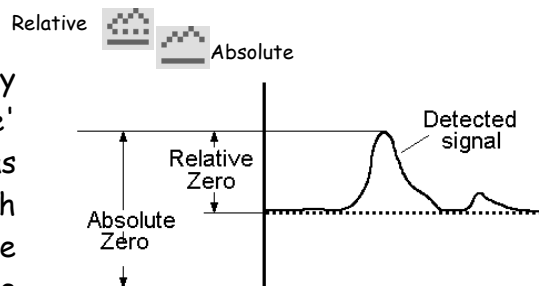
Alarm arrows

↑↑
↑
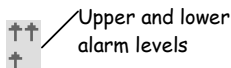
Upper and lower alarm levels

The arrows represent the importance level of the alarm. The single arrow represents the lower alarm and the two arrows represent the upper alarm.

Application

Indicates that 'Health & Safety' mode is selected

When the symbol is present the instrument is in 'Health & Safety' mode. When it is absent the instrument reverts to 'Survey' mode. Please see Application section of this manual for more information (page 25).

Display Screens Explained

Graph Screen

Allows the viewing of real-time measurements in graph format relative to the set alarm levels.

When in 'Survey' mode (see page 25) the type of gas being detected, the measured units, the peak hold and real-time readings are also displayed.

Additional information such as alarm levels and battery status can be viewed by pressing and holding the Enter key.

When in 'Health & Safety' mode (see page 25) the on screen information is slightly different as STEL and TWA calculations are displayed in figures and the graph remains in real time. Again additional information can be viewed by pressing and holding the Enter Key.
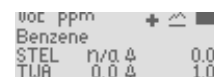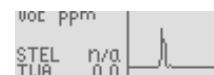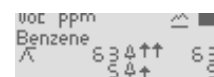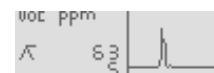
Instrument Displays

Large Number Screen

Enables the viewing of real time measurements in large numerical format for easy viewing in difficult conditions.

Additional information such as alarm levels, battery status and a peak hold reading can be viewed by pressing and holding the ENTER key.

When in 'Health & Safety' mode the STEL and TWA alarm levels and calculated values are shown when holding the Enter key.
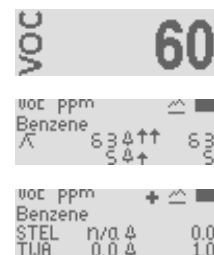
Function Menu

Once selected use the 'UP' and 'DOWN' keys to highlight the function you require and press 'ENTER' to select. Many features can be adjusted in this section including gas selection, zone maintenance, data transfer and alarm levels. Details of these and other functions are to be found on the following pages.

Function menu

Instrument Menu

General
In the function menu use the 'Up' and 'Down' keys to find the function you require. To enter the function press the 'Enter' key.

Data Logging, Zones & Files
PhoCheck+ versions 2000, 3000 and 5000 automatically data log the instruments readings every second. These readings are stored in the instrument's memory with a date and time stamp. The instrument has been designed to continuously store data, once the memory has reached its full capacity (8 Mb) it will automatically begin to over write previous readings. An alarm can be set (see page 25) to inform the user that this is due to happen giving time to download any data that may be over written. Data logged measurements are stored in files created automatically and issued a number that is incremented each time a new file is opened. Stored data can be viewed on the PhoCheck+ instrument or it can be downloaded to a PC for analysis and to be archived. Ion Science recommends downloading saved readings once a week.
In some applications readings need to be recorded in many different locations leading to many hundreds of stored files. PhoCheck+ was designed with these requirements in mind and has the facility to store files into 'Zones'. The PhoCheck+ has a default Zone called Zone 0 (which can not be deleted), unless specified all readings will automatically be stored under this Zone. The PhoCheck+ has an additional 199 Zones which the user can name themselves, either direct via the instrument or by using the IonPC software.
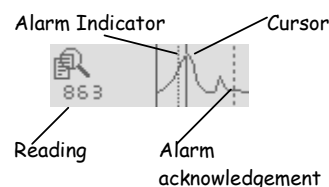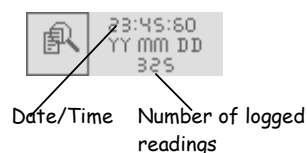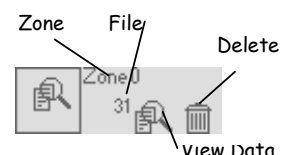

View Data (2, 3 & 5)

This function allows the viewing and deletion of Data Logged Files within the PhoCheck+ memory. First select the Zone of interest by moving the cursor using the 'up' and 'down' keys, press 'enter' to select it. Then select the required File in the same way. Now select the View Data symbol, this will show the first reading logged with a date and time stamp and the number of logged readings within the selected file.
To view the stored data in a graphical form press the 'enter' key. A graph representing the stored readings within the selected file will be displayed. The flashing cursor can be moved along the graph to a reading of interest. When the cursor stops the reading will be displayed in the units selected, press the enter key to see the date and time stamp of that reading if required.

Instrument Menu

View Data (Continued)

The Alarm Indicator dotted line is present on a graph to show that this is the exact point at which an alarm was set off. The instrument will continue to alarm until the alarm is acknowledged by the user by pressing the 'Enter' key, this is shown on the graph as a dashed line (Alarm acknowledgement).

Deleting a File

Should you wish to delete a File, select the Zone and file to be deleted as if you were about to view the data. Now select the delete symbol (Trash can) in the View Data screen. Options are given to delete the currently selected File or All Files.

WARNING: Selecting All Files will delete all files stored in all Zones.

A tick '✓' confirms the function has been carried out.
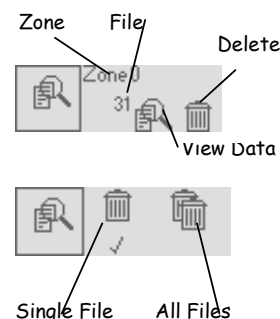
Zone Maintenance (2, 3 & 5)

Zones can be created, selected or deleted in this function. Select the 'New' symbol to create a new zone name, the 'List' symbol to select an existing 'Zone' and the Delete symbol to delete an existing zone name.

Selecting the 'New' symbol allows the creation of Zone names made up of 8 characters consisting of letters, numbers and symbols. Use the up and down keys to choose the characters and press enter to confirm your selection. Letter order on the instrument is shown on the right, the highlighted 'a' is the start letter. Incorporating a useful memory recall the following character will always start as the previous selected aiding your navigation through the letters, numbers and symbols.
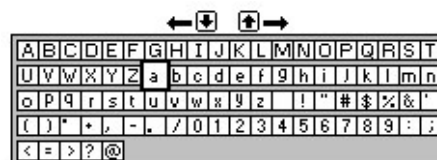
Selecting the 'List' symbol allows you to view existing Zone names, and to select the zone under which you wish to save data.

Selecting the 'Delete' symbol allows the previously created Zone names to be deleted. A tick '✓' confirms a Zone has been deleted.

Instrument Menu

Zone Maintenance (Continued)

Please note that when deleting a zone all data saved under this zone will be deleted. If you wish to keep the data ensure you download it to a PC before it is deleted.

Data Transfer (1, 2, 3 & 5)

Allows the transfer of data between a PhoCheck+ instrument and a IonPC software enabled PC.

To begin communication between the instrument and the computer select the Data Transfer option. When the instrument is communicating with a PC a '✓' will be displayed in the data transfer symbol and when not communicating an 'X' will be shown. Place the instrument on its side with its infrared window approximately 40 mm from the PC's IRDA link.

To exit the data transfer option press 'Esc', the delay symbol will appear for a few seconds before returning to the function menu.

Alarm (1, 2, 3 & 5)

When in 'Survey' mode, upper and lower alarm levels can be set by the user to indicate particular levels of detection specific to their needs.

Both alarms give an audible and visible output (flashing LED) but with increased urgency with the upper alarm. An alarm state indicates that PhoCheck+ has detected the user set alarm level has been exceeded. The alarm will continue to sound and flash until the user acknowledges the alarm by pressing Enter. **Please note that it is the user's responsibility to respond appropriately to an alarm condition.**

Upper and lower alarm levels in survey mode are simple to set via the instrument. Use the up and down keys to select the Alarm graphic in the function menu and press Enter. Then select the alarm you wish to adjust (Upper or Lower), press enter then again use the up and down keys to change the alarm setting. These alarms can also be easily adjusted on a PC via the Gas Table in the IonPC software that is then downloaded to the instrument via the IRDA link (see page 31 for more details). Please note that for safety reasons the lower alarm cannot be set above the upper alarm and the upper alarm cannot be set below the lower alarm.

When in Health and Safety mode, alarms are triggered by STEL and TWA alarm levels pre-programmed into the instruments gas table. An Alarm in Health & Safety mode indicates the user has been exposed to levels exceeding those set within the PhoCheck+ gas table. When PhoCheck+ alarms in Health and Safety mode the relevant TWA or STEL figure shown on the display will flash. These values cannot be changed

Instrument Menu

Alarm (Continued)
either via the instrument or the PhoCheck+ software. However additional entries can be entered into the gas table via the PhoCheck+ software with their own STEL and TWA values see page 31 for more information.

Sound (1, 2, 3 & 5)

Audible outputs can be selected to indicate functions. When Signal is selected, the rate at which the instrument 'Beeps' increases with the detected gas. When Confidence is selected the instrument 'Beeps' every 15 seconds to indicate it is functioning. This feature can be useful if the instrument is out of sight. When Key is selected the instrument 'Beeps' when a key on the keypad is pressed. Alarm can only be adjusted using the IonPC software to avoid the accidental switch off.

Calibration (1, 2, 3 & 5)

'Factory calibration' is set by Ion Science during instrument manufacture. 'Custom calibration' can be set by the instrument user.

General description
Due to the linear output of the Ion Science PID detector cell, PhoCheck+ instruments only require a two-point calibration. The PhoCheck+ scales its linear output across a 'Zero' level (clean air reference) and the 'Span' (a user defined gas concentration).

Factory Calibration
When 'Factory' calibration is selected the PhoCheck+ will measure according to the factory set fixed points and display the selected signal reading according to this reference.
'Factory' calibration offers a constantly repeatable reference, however prolonged use may mean these reference points become less accurate. It is recommended that the PhoCheck+ be returned to Ion Science once a year for an annual calibration and service.

Instrument Menu

Calibration (continued)

Custom calibration

When 'Custom Calibration' is selected a 'Zero' and 'Span' can be set by the user. This allows the user to calibrate the PhoCheck+ PID to an alternative gas (other than Isobutylene). Ion Science provide a Calibration kit accessory (Part number A-845213) which is recommended for use with PhoCheck+, however other gases specific to your needs can also be used.

If performing a custom calibration using the Ion Science Calibration Kit accessory you will need you use the Cal Adaptor supplied with your PhoCheck+ in the Cal Kit sample box. **WARNING:** when fitting the Cal adaptor onto the gas tube (part of the Calibration kit) ensure that the small breather hole of the Cal adaptor is not covered as this will cause the instruments internal pump to be damaged beyond repair. Failure to adhere to this warning will invalidate your warranty should your instrument pump become damaged.

In order to carry out a custom calibration the appropriate parameters need to be set via the PhoCheck+ Ion PC software and downloaded to the instrument. Please see the PhoCheck+ software calibration section (pg 30) for details on how this can be achieved. Once these parameters have been set a custom calibration can be completed, please see the recommended procedure below.

Ion Science suggests Custom calibrating when detection in ppb is required or when high accuracy is needed for a specific gas other than Isobutylene.

Custom Calibration Procedure

Please read ALL of this procedure before attempting a custom calibration and ensure this procedure is carried out in a clean air environment.

1. Select Custom Calibration procedure - a tick '✓' will appear to confirm the selection. Pressing Enter allows the user to enter the Custom calibration menu.
2. Select the flashing 'LAMP' by pressing Enter.
3. The screen will then show the image to the right with a flashing number and a lamp with an arrow. This is asking you to remove the instruments lamp then select Enter. The flashing number will then count down once complete the delay symbol will
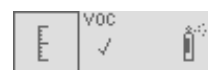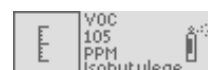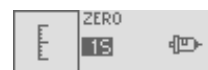
Instrument Menu

Calibration (continued)

appear briefly before a tick symbol to show that the test has been completed successfully.

4. Refit the lamp and select Escape.

5. Scroll down and select the flashing ZERO

6. Remove the caps from both ends of the carbon canister included in the Cal Kit Sample supplied with your PhoCheck+, remove the probe and filter from the instrument and fit the carbon canister. Alternatively a known clean air supply can be used. Note – the carbon canister simply pushes onto end fitting - do not force and no turning is required.

7. Press the Enter key to start the 'Zero' process. A counter will count down showing how long the canister needs to remain connected.

8. At the end of the count down a tick '✓' will appear, indicating that the Zero has been accepted. Press Escape.

9. Disconnect the carbon canister and replace the cap ends. The useful life of the carbon canister will be shortened if the canister is open to atmosphere for prolonged periods.

10. Scroll down and select the flashing VOC.

11. The next screen shows the gas and gas concentration you have previously set up via the IonPC software. Select Enter.

12. A screen will show VOC, a gas bottle and a flashing highlighted number.

13. Present the instrument with the calibration gas and press enter, the number will begin to count down showing how long the instrument needs to be presented with the gas. A tick '✓' will appear indicating that the calibration has been accepted. Escape out of the calibration menu.

14. Now replace the instruments filter and probe ready for use.

If you are not successful in calibrating the instrument check the following points:-

- The carbon canister may be contaminated
- The calibration gas canister may be low or empty
- If using a connector pipe there may be a kink restricting the flow of gas
- PID lamp may require cleaning
- PID lamp may need replacing

Instrument Menu

Back-light (1, 2, 3 & 5)

The instrument display can be illuminated when in low light conditions. When On is selected the back-light is on when ever the instrument is switched on. When Off is selected the back-light is permanently off. When Timed is selected the back-light illuminates for a pre-set time after every key press. When timed is selected pressing enter allows the user to adjust the on time from 1 to 60 seconds.
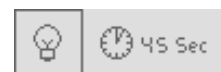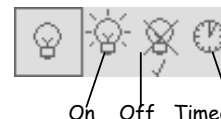
Date / Time (2, 3 & 5)

The Date / Time function allows the adjustment of the time and date used within the PhoCheck+ internal clock. The internal clock is used for the data logging date / time stamp. When readings are being stored for download and future use and record keeping ensure that the clock and date are accurately set. The 12 / 24 hour time format is also adjustable. Ion Science recommend that you set your date and time before using your instrument for the first time.

PID Gas Selection (1, 2, 3 & 5)

The PhoCheck+ photoionisation detector (PID) is non-selective. Although many VOC gases are detectable, the PhoCheck+ PID cannot differentiate between the gases. When you select the VOC gas you wish to measure from the PhoCheck+ internal gas list, the instrument will calculate the equivalent level for that selected gas against an isobutylene calibration.
Please note that there may be other detectable gases present that may effect the measurement.

WARNING: Ion Science Ltd makes every effort to ensure the gas tables held within the PhoCheck+ memory and supplied on CD are accurate at the time of manufacture. In critical applications alarm levels must be checked, compared and adjusted to local legislation before use.

Instrument Menu

PID Gas Selection (continued)

Custom offers a quick route to the last 10 selected gases. When selected, use the UP and DOWN keys to change the gas then press ENTER to select.
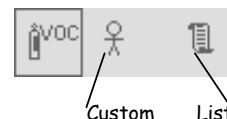
List allows selection of any gas from within the gas table held in the PhoCheck+ memory.

After selecting the List symbol, select the first letter of the gas you wish to select and press ENTER. The PhoCheck+ will then list all gases starting with that letter. WMD gases are prefixed with the letters WMD.

Alarm levels that are set in the Gas table will be automatically selected. Should a gas be selected that is not compatible with the selected lamp the following symbol will appear to highlight the incompatibility.

PID Lamp (2, 3 & 5)

An alternative lamp to the Krypton 10.6eV (standard) can be purchased, fitted and selected. A tick '✓' confirms the selection.

Should a Lamp be selected that is not compatible with the selected gas the following symbol will appear to highlight the incompatibility.

Unit Selector (1, 2, 3 & 5)

The PhoCheck+ photoionisation detector can be selected to measure VOC's in either ppm (Parts per million, by volume), ppb (Parts per billion) or mg/m^3 (Milligrams per cubic meter). NB: the ppb option is available on the PhoCheck+ 5000 and is upgradeable on the 1, 2 and 3000 versions.

Instrument Menu

Data Log Memory Alarm (2, 3 & 5)

PhoCheck+ has been designed to continuously store data, once the memory has reached its full capacity (8 Mb) it will automatically begin to over write previous readings. An alarm can be set to inform the user that this is due to happen giving the user time to download any data that may be over written if they wish to do so.

Application - Health & Safety Mode (3 & 5)

Modes of operation are selected to suit how the instrument is being used.

Health & Safety mode is used to check for conformity of short-term exposure levels (STEL) or time-weighted averages (TWA) that are specific for particular hazardous environments (for example EH40 in the UK and OSHA in the USA).

In this mode of operation STEL's and TWA's are continually calculated and compared to levels set in the instruments gas table.

When selected

You can not adjust settings or parameters of the instrument while in Health & Safety mode as these could effect the ongoing calculations. Should you want to proceed with an adjustment a WARNING screen will appear. You have the option to continue with the adjustment by pressing Enter or abort and continue monitoring by pressing the 'Esc' key. Continuing with the adjustment will reset the instrument, calculations will begin again from 0 once back in Health & Safety mode.

Application - Survey Mode

'Survey' is the default mode of operation whenever the 'Health & Safety' mode is NOT selected. All functions can be adjusted or selected in this mode unless the 'Security mode' is set via the IonPC software. 'Survey' mode is often used in applications where several areas (or Zones) can be monitored and readings data logged. Saved data can then be downloaded to a PC for long-term storage and review. High and low alarm levels can be set.

<u>Instrument Menu</u>

Security

When the PhoCheck+ is connected to a PC via the PhoCheck+ software package (see pg 33), the instrument can be locked in the Menu Settings area of the software package. This facility allows the instrument to be set-up by a qualified or competent person locked and then handed to an operator for use. When in secure mode the PhoCheck+ functionality cannot be changed or adjusted. The user can only view the display screens and switch the instrument On and Off.

IonPC Software

PC Requirements

PhoCheck+ Software must be used in conjunction with a PC/laptop using Windows XP. An IRDA port is required for communication with the instrument. Many laptops are supplied with this facility. Alternatively IRDA modules can be purchased from most retailers for use with your instrument.

Before connecting your PhoCheck+ to a PC for the first time confirm that the PC's IRDA works correctly with another devise.

Installation of IonPC Software

1. Insert Ion Science software CD into your CD rom drive
2. The CD will automatically start up.
3. Click on the Download Software button
4. A pop up screen will appear asking if you would like to run or save the file called setup_def.msi
5. Click Run
6. Click Run
7. Another screen will pop up. Follow the on screen instructions to install the IonPC software to your computer.
    8. Click Next
    9. Click Next
    10. The installer will automatically create a folder in you C drive to save IonPC into if you do not want to save it there Browse for the location you would like it to be saved in and click Next
    11. Select Next again to install the software
    12. The software will take a few seconds to install then click Finished
13. You will now be able to open your IonPC software from the Icon on your desk top or from your Start menu/Programs/IonPC.

IonPC Software Features

Connecting PhoCheck+ with a PC

Switch on your PhoCheck+ instrument, select the Data Transfer symbol from the menu and press the enter key. When communicating with a computer the PhoCheck+ displays a '✓' within the data transfer symbol. When not communicating an 'X' will appear.

Place the PhoCheck+ on its side with the instruments infrared window approximately 40 mm from the PC IRDA, then start the PhoCheck+ software.

Starting PhoCheck+ Software

Start the IonPC software either from your desktop via the shortcut or from the Start menu/Programs/Ion PC .

CAUTION

Ensure that communication is not broken between your instrument and the IRDA when you are 'Applying'/sending information from your PC to the instrument (approx 20 seconds). If the transfer is disturbed your instrument may crash and need to be returned to Ion Science Ltd.

IonPC Software Features
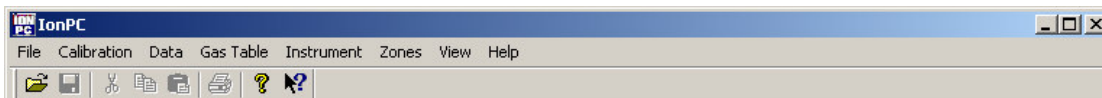
IonPC software has many features allowing the transfer for data and function specifications to and from the instrument and the PC.

Downloading data logged readings

PhoCheck+ should always be presented to the IRDA port before the PhoCheck+ software is run.
When the software is opened like this it will immediately begin communicating with the instrument and will give you the option to download data logged readings, as shown here.
Select 'Finished' if you do not wish to download the data.
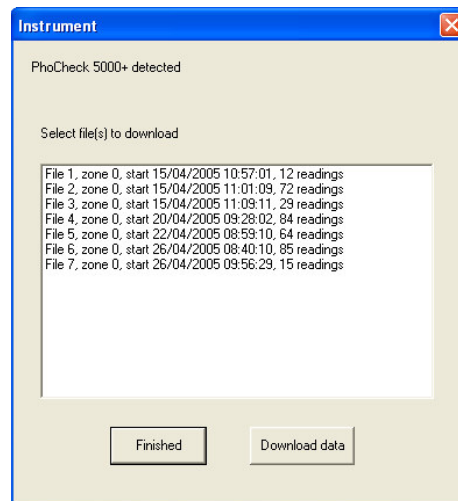
If you do wish to download data, highlight the files you Require, then select Download data. The screen on the right will appear.
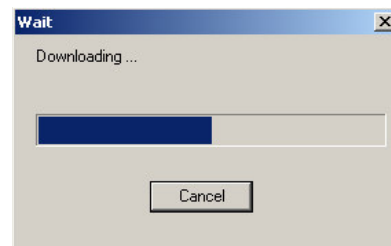
The data will then download from your PhoCheck+ to your PC in numerical and graph format once the downloaded is complete select Finished. You then have the ability to zoom in on the graph data for a closer look by double clicking anywhere on the graph. You can also store the data for future reference.
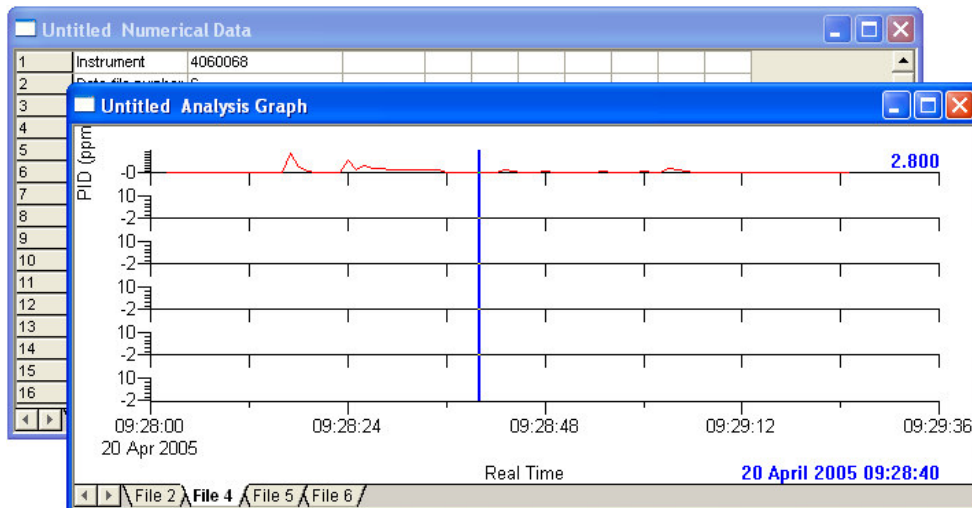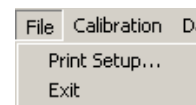
IonPC Software Features

File

Allows the printing of files downloaded from your PhoCheck+
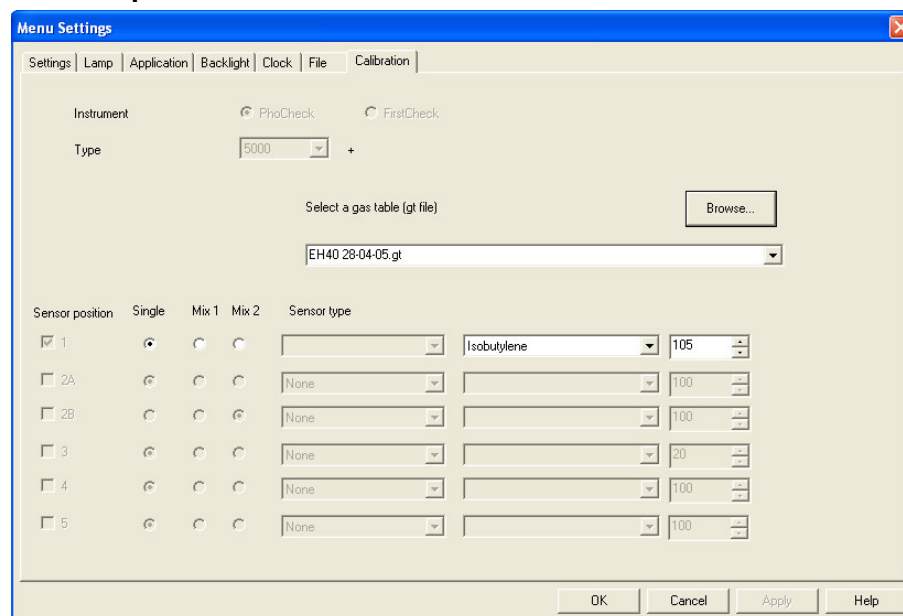instrument.

Calibration

Refers to the 'Custom' calibration of PhoCheck+. Enables the
download of calibration data from the instrument to a PC, the
erasing of the Custom calibration settings, the opening of
previously saved calibration settings and the adjustment of the
'Custom' Calibration Setup.
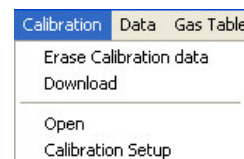
Calibration Setup

The gas table provided with the software will be shown. However if you wish to use a
different gas table previous selections will be shown on the drop down menu or click
'Browse' and search for and select the table you require.

You can now choose to set up your Custom calibration to your specific gas and
concentration requirements. Click 'Apply' to send your specifications to the instrument.
You are now ready to calibrate your PhoCheck+, see pg 20 for details. The greyed out
areas apply to the FirstCheck software, required if you upgrade your instrument.
CAUTION When information is downloading to your instrument (approx 20 seconds)
ensure that the communication between the instrument and IRDA is not broken. If the
transfer is disturbed your instrument may crash and will need to be returned to Ion
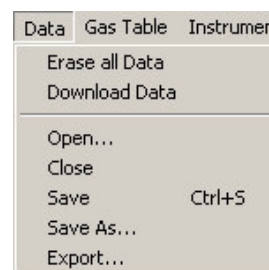Science Ltd.

IonPC Software Features

Data

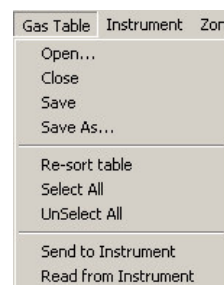Data logged information can be cleared from your instrument or downloaded from the instrument to your PC.
Once downloaded to your PC files can be saved for future reference and exported as CSV files.

Data	Gas Table	Instrumen
Erase all Data		
Download Data		
Open...		
Close		
Save		Ctrl+S
Save As...		
Export...		

Gas Table (Including setting alarm levels)

Select a gas table stored in the PhoCheck+ directory. You are able to modify this table and then download it to your instrument.

If you wish to add new gases to the table ensure you use the next available line, leaving no spaces as shown below.

Gas Table	Instrument	Zone
Open...		
Close		
Save		
Save As...		
Re-sort table		
Select All		
UnSelect All		
Send to Instrument		
Read from Instrument		

Upper and lower alarm levels in Survey mode can be adjusted via the gas table. Type the desired alarm level in the appropriate column (either high or low alarm) against the gas you wish to change.

Use the tick boxes beside each gas to select / deselect the gases to be downloaded to your PhoCheck+ then select 'Send to Instrument' from the dropdown menu shown above.

Always save modified gas tables under a different file name, keeping the original complete.

EH40 28-04-05.gt

| Select	Gas Name	Abbreviation	Formula	Molecular weight	11.7eV (Ar) Factor	10.6eV (Kr) Factor	10.2eV (D2) Factor	8.4e (Xe) Fa
✓	Xylene, o-		C8H10	106	0.69	0.6	0.57	ZR
✓	Xylene, p-		C8H10	106	0.62	0.46	1	4
✓	Xylidine, all		C8H11N	121	NA	0.7	NA	ZR
✓	WMD Arsine		AsH3	78	NA	2	ZR	ZR
✓	WMD Lewsite		CICN	62	NA	1.2	ZR	ZR
✓	WMD Mustard Gas		C2H2AsCl3	159	NA	1	ZR	ZR
✓	WMD N-Mustard Gas		C4H18SCl2	172	NA	1.1	ZR	ZR
✓	WMD Phosgene		COCl2	99	2.1	ZR	ZR	ZR
✓	WMD Sarin		C4H10PO2F	140	NA	3.1	ZR	ZR
✓	WMD Soman		C7H116P02F	182	NA	3.2	ZR	ZR
✓	WMD Tabun		C5H11PN202	162	NA	1.2	ZR	ZR
✓	WMD VX		C11H26PNS02	267	NA	1	ZR	ZR
✓	WMD GF		C7H14P02F	180	NA	3.3	ZR	ZR
✓	WMD DMMP		C3H9P03	124	NA	5	ZR	ZR
✓	WMD Triethyl phosphate		C6H15P03	182	NA	3.5	ZR	ZR
✓	WMD Methyl salicylate		C8H19O4	152	NA	1	ZR	ZR
✓	New gas	Mix	C14H12	101	1	1.2	3	10

PID

IonPC Software Features

Instrument

Instrument details such as serial number and data logged memory used can be downloaded from your PhoCheck+ to your PC.

Instrument upgrade allow the upgrade of your instrument to other PhoCheck+ variants once you have purchased the pass code from ISL. Firmware upgrade allows you to upgrade your actual instrument software directly should an upgrade be made available.
'Menu Set-up' allows you to change PhoCheck+ settings from your PC. These settings can be saved for future use.
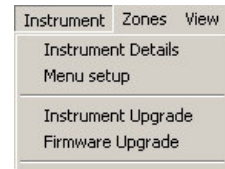
Menu Set-up

Adjustable features found on your PhoCheck+ instrument can also be changed via your PC along with some additional features. These features can be adjusted and then downloaded to your instrument by selecting Apply. ***CAUTION*** When information is downloading to your instrument (approx 20 seconds) ensure that the communication between the instrument and IRDA is not broken. If the transfer is disturbed your instrument may crash and will need to be returned to Ion Science Ltd.

Settings

Within this tab there are a number of additional features including the clock (24 hr or 12 hr), sound controls on signal, confidence (a beep sounds every 15 seconds), on key press and on alarm. When selected the bump test sets the instrument to show a gas bottle image once a week when the instrument is turned on as a reminder to test the instruments response. Memory full alarm will ensure an alarm sounds if the PhoCheck+ data log memory is full to enable you to download the data or continue and overwrite previously saved data. Cycle screen is blocked out as this is an upgrade feature on the FirstCheck.
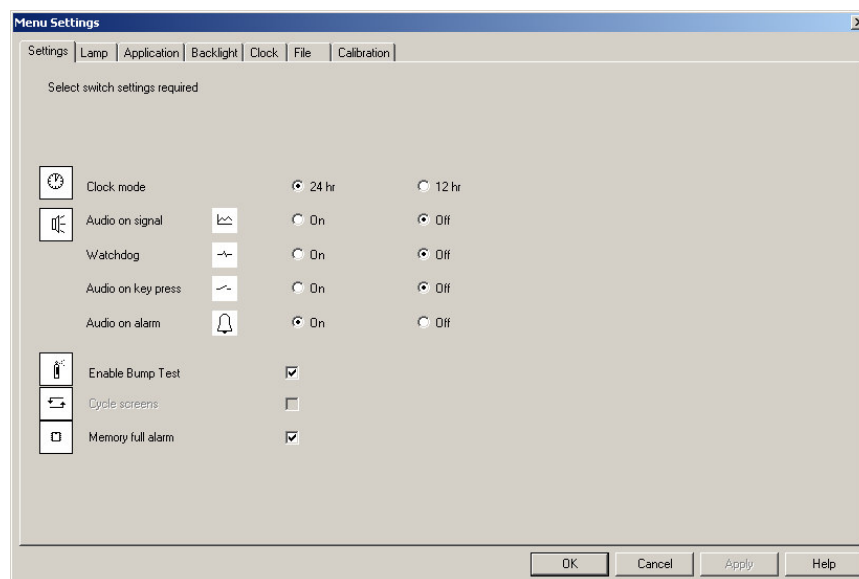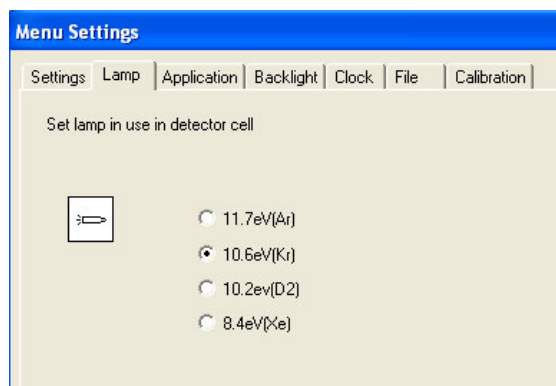
IonPC Software Features

Lamp

Enables the selection of different lamp types you may have purchased to use with your instrument.

Application

Enables the selection and de-selection of Health & Safety mode and the selection of ppm, ppb or mg/m^3. In Health & Safety mode STEL and TWA timings can be adjusted to reflect the changes in legislation between the US and Europe.

The instrument can be set to security mode which enables the locking of the user interface so that the instrument functions can not be changed manually. To de-select security mode, switch the instrument Off then On, you then have 2 minutes from 'switch on' to connect your instrument to a PC and select Instrument / Menu set up. This will automatically place your instrument in PC mode ready for download or further adjustment. VOC smoothing relates to the PID reading and is used to have a dampening affect on the measurements for high gain factor gases. In effect increasing the T90 time to create a smoother graph. This affect can only be applied when in 'Survey' mode it does not apply in Heath & Safety.
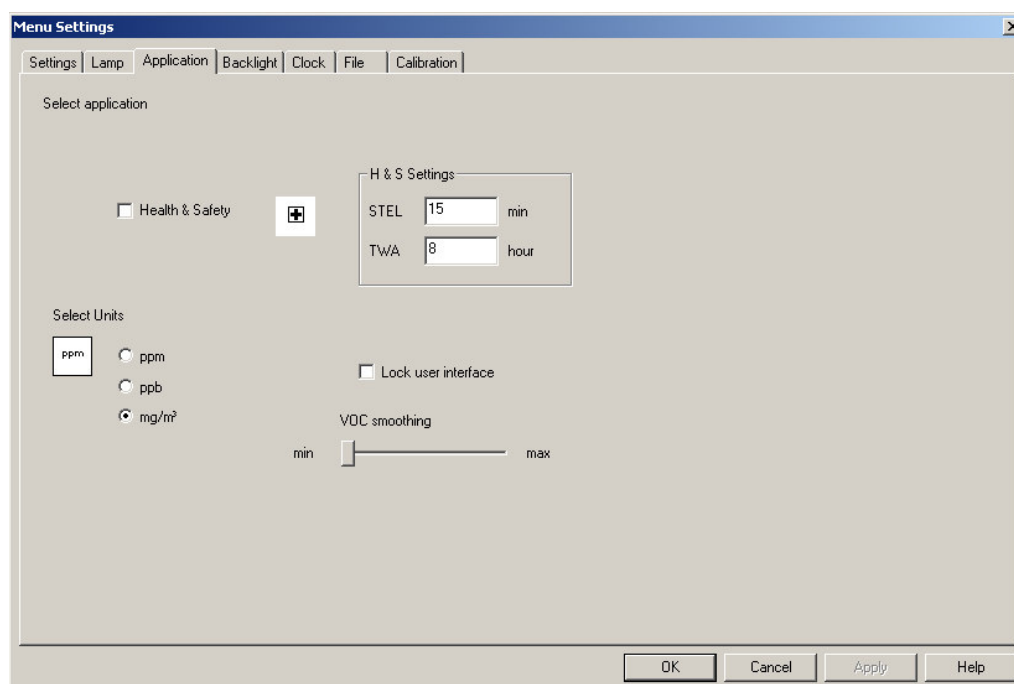
IonPC Software

Backlight

Gives you the option of turning the back light on or off permanently or setting it on a timer after every key press.
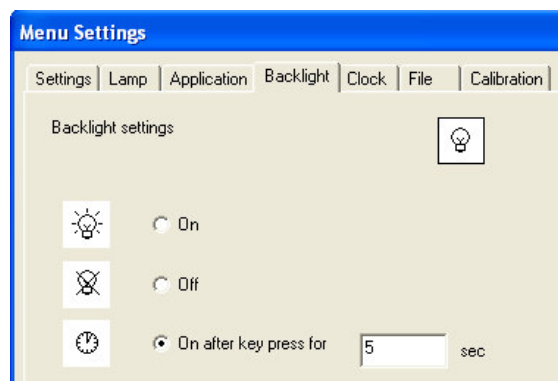
Clock

Set the instruments clock and date for the purposes of data logging. Either set it manually or if your PC clock is correct you can simply set your instrument to the same time as your PC clock.
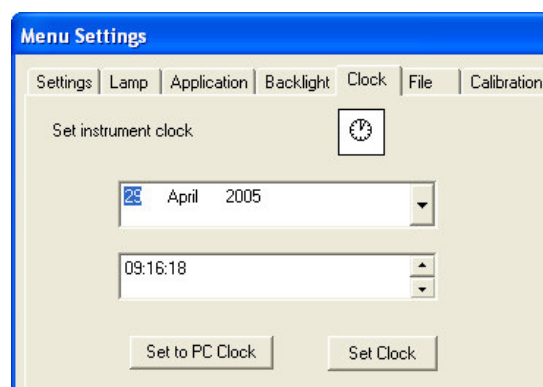
File

Allows you to save the settings you have created to your PC for future use. It also enables you to open previously saved settings to then download to your instrument.

IonPC Software Features

Calibration

The calibration settings can also be adjusted under the Menu Settings and it is the same layout as described on page 30.

Once you have selected all of your settings you can either choose to 'Apply' them, which will download the information straight to the instrument and leave the screen open, or select OK, and they will be transferred to the instrument and the screen will close automatically.
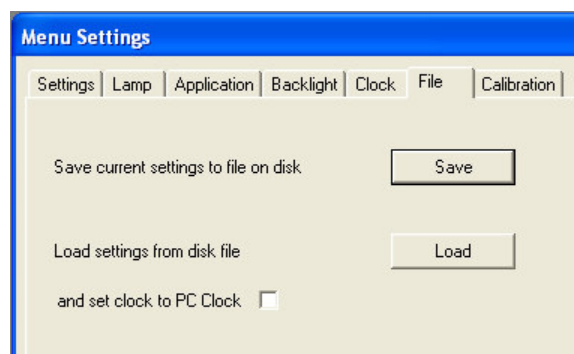
CAUTION When information is downloading to your instrument (approx 20 seconds) ensure that the communication between the instrument and IRDA is not broken. If the transfer is disturbed your instrument may crash and will need to be returned to Ion Science Ltd.

Zones

Clear / Delete existing Zones from your instrument or create new Zones for download to your PhoCheck+. Please note data files stored within a Zone to be deleted will be lost. Always download Data from your instrument before deleting Zones.
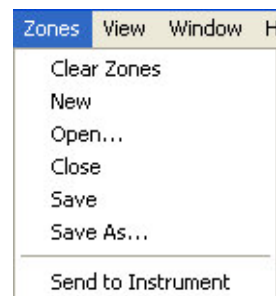
View

Select or hide the PhoCheck+ software toolbar or status bar.

Help

Offer advice on the use of PhoCheck+ software.

IonPC Software

Software Disclaimers

Termination of Software Licence

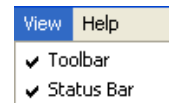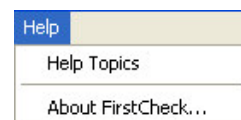This License is effective until terminated. This License will terminate automatically without notice from Ion Science Ltd if you fail to comply with any provision of this License. Upon termination, you agree to destroy, delete or purge the written materials and all copies of the SOFTWARE, including modified copies, if any.

PhoCheck+ is a portable gas-detector suitable for the detection of; volatile organic compounds (VOC's) using PID (Photo Ionisation Detection) technology.

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IonPC Software

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Governing Law

The laws of the United Kingdom govern this Agreement.

Batteries

WARNING:
For reasons of Intrinsic Safety, batteries <u>MUST NOT</u> be charged or replaced within potentially flammable areas. Ensure you are in a SAFE area before carrying out any type of maintenance on your PhoCheck+ instrument.

Instrument battery type identification
Non-rechargeable PhoCheck+ instruments have a removable battery cover on the rear of the handle area. A security tool is required to remove it.

Rechargeable PhoCheck+ instruments have no removable battery cover but have a charging socket on the instruments end.

Non-rechargeable battery types to be used
For Intrinsic Safety of T4 rating and reduced risk of explosion you must only use Duracell Standard, Procell Alkaline, Zinc Carbon R6, R6B, R6PP or an ION SCIENCE APPROVED battery pack. <u>DO NOT</u> mix old / used batteries or batteries from different manufacturers.

Rechargeable battery instruments
Ensure rechargeable PhoCheck+ instruments are charged for at least 12 hours before using it for the first time. When the instrument is on charge a screen will display the instruments charging status.
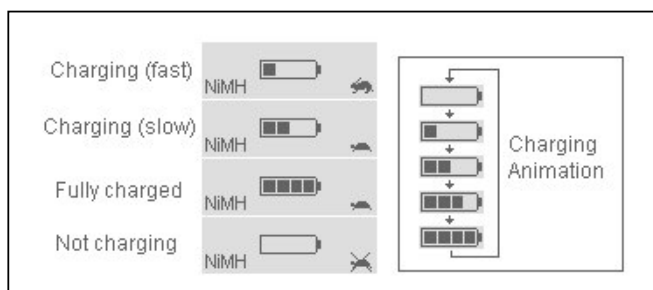
When the battery power is very low the following symbol will appear.

NB: Only use the charger supplied with your PhoCheck+ to charge your instrument.

Batteries

Replacement of Non-rechargeable batteries

1. Ensure the PhoCheck+ is switched Off.

2. Using the battery cover removal tool provided, remove the battery cover at the rear of the instrument casing. This reveals a set of 4 x AA cells contained in a removable battery clip.

Removable
battery clip

3. Remove the battery clip.

4. Replace the exhausted batteries using the guidelines stated above.

5. Check all batteries have the correct polarity before reconnecting the clip to the instrument.

WARNING: Fitting batteries or connecting the clip with the wrong polarity may result in damage to the instrument!

NB: When loading batteries check for correct battery polarity before connecting batteries.

Diagnostics

Basic faults or diagnostics are presented as symbols with a more detailed description of the fault indicated by the number in the top right hand corner of the display. Should a fault occur correct the issue and then press 'Enter' or 'Esc' to clear the fault message.

General fault

1. Main PCB failure.
Return the instrument to manufacturer.

Pump

1. Pump failure
Check the probe, filter and cell cap are fitted.
If the error persists return the instrument to the manufacturer.
2 & 3. Sample gas flow is low.
Check the probe and filter for signs of blockage.
If the error persists return the instrument to the manufacturer.

Battery

Battery is low or:

1. Not charging.
Check charger is connected and switched ON at supply.
2. Slow charge current is low.
Check the battery settings.
3. Slow charge current is high.
Disconnect the charger immediately and contact ISL.
4. Fast charge current is low
Check the battery settings.
5. Fast charge current is high.
Disconnect the charger immediately and contact ISL.

With all battery related faults, if the fault persists return the instrument to the manufacturer.

Diagnostics

Sensor

1. Detector cell fuse failure

If the error persists return the instrument to the manufacturer.

2. Contaminated detector cell

If the PhoCheck+ is used without its filter or filters are not replaced on a regular basis, particles of dust or dirt can cause a range of effects.

Remove the detector lamp as shown on page 43 and use low pressure oil-free compressed air to blow out the contamination via the small pipe. Replace cleaned lamp and try again. If the error persists return the instrument to the manufacturer.

Gas Selection

The gas being selected is not compatible with the selected lamp.

The lamp being selected is not compatible with the selected gas.

Press Esc and select a compatible gas and lamp.

Health & Safety

When in Health & Safety mode the selected gas has no STEL or TWA alarm values.

This provides a warning in Health & Safety mode that the change you are making could effect the ongoing calculations. You can proceed with the adjustment by pressing enter or return to the display screens by pressing Esc.

Memory Alarm

The data logging memory is full and will begin to write over write previous readings.

Will only show if the data logging memory alarm has been set to ON (see pg 25 & 32).

Press Esc and either continue and previous readings will be over written or down load saved data to a PC before continuing.

Diagnostics

Clock

The internal clock has failed.
Return the instrument to the manufacturer.

Delay

This symbol will appear during the manual adjustment and selection of functions of the instrument. It indicates that data within the memory is being moved. Please wait and the symbol will disappear after a few seconds depending on the change being made.

Maintenance

1. Keep the PID detector lamp window clean.

2. Replace the sample filters on a regular basis.
Frequency of cleaning the detector lamp and replacement of the filter depends on the type of gas being detected and the quality of the background air.

Cleaning the PhoCheck+ Lamp

The PhoCheck+ PID relies on an ultraviolet light source ionising VOC gases as they pass across the lamp window. This process may result in a very fine layer of contamination appearing on the detector window that must be removed on a regular basis.

CAUTION!

The PhoCheck+ is a sensitive detector. Internal components must be handled with clean hands and clean tools. The PhoCheck+ lamp is fragile. Handle with great care!

1. Ensure that the PhoCheck+ is switched OFF.

2. Remove the probe and filter.

3. Unscrew the black knurled ring to expose the detector lamp.

4. Push a lamp-removing sleeve over the end of the lamp. This allows the user to grip the glass.

5. Extract the lamp from its socket by pulling it in a straight line away from the PID cell. Force is only required when pulling the lamp past the O ring. Once past the O ring the lamp will move freely.

Passed the O-ring

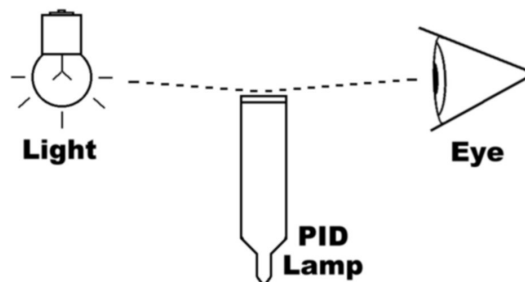Move freely in a straight line

WARNING!
NEVER REFIT A DAMAGED LAMP!

Maintenance

Cleaning the PhoCheck+ Lamp (Continued)

6. Inspection of the lamp may reveal a layer of contamination on the detection window that presents itself as a 'blue hue.' To check for contamination, hold the lamp in front of a light source and look across the window surface.

USE of PID lamp cleaning kit A-31063

1. The vial of cleaning compound contains Aluminium Oxide as a very fine power (CAS Number 1344-28-1). A full material safety data sheet MSDS is available on request from Ion science ltd. The key issues are listed below:

Hazard identification:
- May cause irritation of respiratory tract and eyes.

Handling:
- Do not breathe vapour/dust. Avoid contact with skin, eyes and clothing
- Ware suitable protective clothing
- Follow industrial hygiene practices: Wash face and hands thoroughly with soap and water after use and before eating, drinking, smoking or applying cosmetics.
- The Compound has A TVL(TWA) of 10 mg/m^3

Storage:
- Keep container closed to prevent water adsorption and contamination.

2. Open the vial of Aluminium Oxide polishing compound. With a clean cotton bud collect a small amount of compound.

3. Use this cotton bud to polish the PID lamp window. Use a circular action applying light pressure to clean the lamp window. Never touch the lamp window with fingers.

4. Continue polishing until an audible "squeaking" is made by the cotton but with compound moving over the window surface. (usually within 15 seconds)

Maintenance

5. Remove the residual powder with a clean cotton bud. Care must be taken not to touch the tips of cotton buds that are to be used to clean the lamps as this may contaminate them with finger oil.

6. Ensure the lamp is completely dry and any visible signs of contamination are removed before refitting.

7. The instrument MUST now be re-calibrated.

Caution: Condensation may form within the PhoCheck+ detector cell if taken from a cold to warm atmosphere. This may appear as a high background level even in a clean air environment. To compensate for this error, press and hold the ZERO key for two seconds.

Accessories

Ion Science Ltd has developed an exclusive range of high quality accessories to compliment the PhoCheck+. Please see a selection of these below.

| Part Number	Accessory Description
A-830206	IS Protective Cover ⟨Ex⟩ II 1 G EEx ia IIC T4/ ⟨Ex⟩ II 2 G EEx iad IIC T4 Baseefa 02ATEX0093X, Baseefa 03ATEX0742X PK of 10
A-845213	Calibration Kit
A-31064	25mm (1") diameter 0.5 micron probe filter PK of 5
A-31066	Std probe attachment PK of 5
A-31063	PID Lamp Cleaning Kit (20 Cleans)
A-30555	5 m (16 ft) flexible extension hose
A-30556	10 m (33 ft) flexible extension hose
A-31153	Exhaust barb, Tedlar bag connector
A-31057	Carbon filter
30618	PID lamp, type 8.4 eV Xenon
30619	PID lamp, type 10.2 eV Deuterium
30620	PID lamp, type 10.6 eV Krypton
30621	PID lamp, type 11.7 eV Argon
31052	Leather instrument jacket
40052	Leather instrument jacket with magnetic attachment
4/VH-01	Instrument chest harness for hands free operation
1/VS-18	Universal 9 volt power supply without plug
1/VS-16	9 V power supply UK moulded plug
1/VS-17	9 V power supply Euro moulded plug
1/VS-19	9 V power supply US moulded plug

IS Protective Cover

Fitting Instructions

1. Insert instrument into the IS protective cover ensuring that the probe tip exits through the small slit at the top of the cover and that the cover labelling and stickers are on the reverse of the instrument.

2. Seal the cover at its base and lay the instrument on a flat surface with the label and stickers facing upwards.

3. Peel off the backing to the large section of double-sided tape in the middle of the instrument.

4. Gather the excess plastic on one side of the instrument and stick it on the midway point of the double-sided tape.

5. Gather the excess plastic on the other side of the instrument and stick it to the remainder of the double-sided tape.

6. Now remove the backing from one of the small pieces of tape and secure it to the side of the instrument.

7. Remove the final piece of backing and secure it to the other side of the instrument.

8. The instrument is now ready to use in Category 1 (zone 0) areas and in applications where it is likely to get wet.
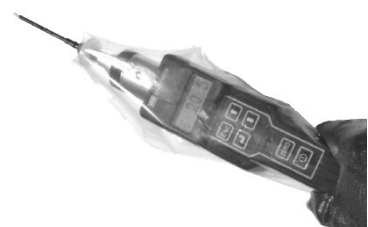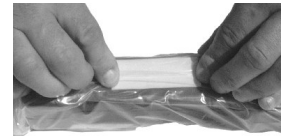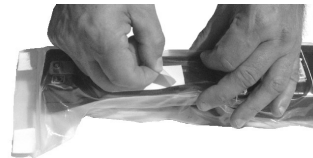
Upgrade Options

All PhoCheck+ instruments have the ability to be upgraded in the field to the other variants within the PhoCheck+ range. This change can simply be achieved by contact Ion Science for a quote and placing an order. We will supply you with the a unique security key code for your specific instrument which can be downloaded to the instrument via the Ion PC software to make the change:

It is also possible to upgrade any PhoCheck+ instrument to a FirstCheck+ instrument to incorporate the multigas sensors for O2, H2S, CO and LEL gas detection for the ultimate in gas detection. This upgrade will require the return of the instrument to Ion Science or an Ion Science approved service centre. Please do not hesitate to contact Ion Science if you require any more information or would like a quote.

	PhoCheck+ 1000	PhoCheck+ 2000	PhoCheck+ 3000	PhoCheck+ 5000	FirstCheck+ 4000	FirstCheck + 6000
PhoCheck+ 1000		Upgrade	Upgrade	Upgrade	Upgrade	Upgrade
PhoCheck+ 2000			Upgrade	Upgrade	Upgrade	Upgrade
PhoCheck+ 3000				Upgrade	Upgrade	Upgrade
PhoCheck+ 5000						Upgrade
FirstCheck+ 4000						Upgrade
FirstCheck+ 6000						

Service Options

Ion Science is pleased to offer a number of service options on our PhoCheck+ product range. The options below allow you to choose the cover provided for your instrument that best suits your needs.

At Ion Science we recommend that all of our gas detection instruments be returned for recalibration on an annual basis to ensure optimal performance. For your convenience re-calibration has been built into both service options. Choose between our Gold and Platinum Service levels giving you piece of mind in a fixed cost solution.

Gold Service

- Includes annual calibration after 12 months
- Includes all repair costs and required spare parts
- All calibrations and repairs will be carried out in 3 working days – if not a replacement instrument will be sent out of equal or greater specification.
- Instrument will be upgraded to the latest software versions upon return to Ion Science.

Platinum Service

- Never be without your instrument!
- Should your instrument fail or need to be returned for annual re-calibration Ion Science will first ship you a replacement instrument, of equal or greater specification with the latest software, by courier who will also collect your returning instrument.
- Includes your annual calibration and any required spare parts.

Both Gold and Platinum options can be purchased on a yearly basis or on a 5 year service contract option. By entering into either service contract, this will entitle you to various accessories, discounts and promotions.

For more information please contact our service department:

Telephone: +44 (0) 1763 207228
Fax: +44 (0) 1763 208814
Email: calibration@ionscience.com

Technical Specifications

Detector	Range	Response Time*
PID (VOC detector)	1 ppb - 10,000 ppm (5000Ex) 0.1 ppm – 10,000 ppm (3000Ex) 0.1 ppm – 4,000 ppm (1000Ex and 2000Ex)	T90 < 1 second
Accuracy	+/- 5% displayed reading**	
Linearity	+/- 5%**	
Battery	4 x AA size	Specified Alkaline or 1.2V Rechargeable NiMH
Alarm	Flashing LED and 90 dBA (10 cm) audible sounder	
Flow Rate (Approx)	220 ml/min or 220 cc/min	
Temperature	Operating Storage	-20 to 60 °C (-4 to 140 °F) -25 to 60 °C (-13 to 140 °F)
Dimensions	Instrument Standard Carry Case:	340 x 60 x 50 mm 420 x 320 x 97 mm
Weight	Instrument Packed in case	0.640 kg (1.4 lb) 3.1 kg (6.8 lb)
Materials	Instrument Standard Carry Case	Conductive carbon-loaded polypropylene-based resin casing. Polypropylene, with a polyester foam insert

*Response time of the instrument is affected by the use of a length of tubing in applications such as confined space entry. The following response times show the affect on the PID detector based on 213 ml/min with a filter attached with a tube internal diameter of 1.6 mm at 20 °C:

Length of tube	Flow ml/min	Response time in seconds
Standard probe	213	0.1
1 m	212	0.8
2 m	212	1.7
3 m	211	2.6
5 m	209	4.3
10 m	199	9.0
20 m	190	19.0
30 m	172	32.0

** Assumes constant environmental conditions

Technical Specifications

Expected lifetime of parts

Batteries
New fully charged (rechargeable) batteries at 20 °C > 10 hours normal use.
Affects on battery capacity:
10% less per 10 °C drop in temperature.
As the batteries age they may self discharge to half capacity from fully charged state.
At   25 °C – 50 days
          37 °C – 25 days
          48 °C – 5 days
          60 °C – 1 day
The back light will consume an additional 50% power and significantly reduce the instrument 'on time'.

Filter
The filter should be changed every 100 hours of use. This frequency should be reduced for dusty or moisture laden environments.

PID Lamps
10.6 eV, 10.2 eV and 8.4 eV expected life of 3 years and 11.7 eV 1 month. Lamps are very fragile please handle with care at all times, never touch the window and do not drop!
Lamp cleaning for normal use is every 100 hours of use (based on 30 ppm for 100 hours). Reduce this if used in heavily gas contaminated environments. Please note that some esters, amines and halogenated compounds may accelerate window fouling cleaning may be required for every 20 hours of use. Cleaning frequency will also depend upon alarm levels set and prevailing environmental conditions.

PID Cell
Electronic cell has an indefinite life however it may suffer contamination problems – it is essential that a clean filter is attached during use. Some gases such as methelene chloride in high concentrations may condense on to the walls of the cell. If condensing is severe and cannot be cleaned, then a replacement may be required.

NB: PID specifications relate to an isobutylene 100 ppm in air calibration at 20 °C and 90% RH.
    LEL specifications relate to a methane (CH4) calibration, other gases are available upon request.
    Other gas sensors as specified at appropriate international alarm standards.