



# USER MANUAL



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GASCHECK G SERIES

# CONTACT US

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## 1. SCOPE

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This manual contains safety, operation, and maintenance information for GasCheck G Series handheld sniffer leak detector. Our leak detectors are designed to ensure safety when used properly. It is the responsibility of the user to follow safety-related warnings, cautions, notes, and other requirements described in this manual.

Should a question, comment or problem arise, the information below is provided as a guide. When returning a unit for factory service or calibration, contact Portable Leak Detectors for a return material authorization number (RMA). The device should be boxed securely and contain all contact information, including return shipping information. If the device is being sent to the factory for service, a written statement of the problem or symptoms should then be included. The RMA number must be on the outside of the package or indicated on the shipping label.

## 2. SAFETY

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Please read this manual in full before using the GasCheck G Series instrument. Portable Leak Detectors takes no responsibility for damage, injury or death resulting from misuse, misunderstanding or negligence while using this gas detector. Please contact Portable Leak Detectors for clarification on any aspect of this manual that is not understood or for additional information.

### 2.1 QUALITY ASSURANCE

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GasCheck G Series instruments are manufactured in compliance with ISO9001:2000, which ensures that the equipment supplied to the customer has been designed and assembled from traceable components, leaving Portable Leak Detectors calibrated to traceable standards.

### 2.2 RESPONSIBILITY OF USE

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Many gases are hazardous and can cause explosion, poisoning and corrosion resulting in damage to property and life. It is the responsibility of the person using this instrument to ensure it is being used in accordance with this manual and that the instrument is functioning correctly before use.

The GasCheck G Series handheld leak detectors can detect a large range of gases but some gases are more difficult to detect. It is the responsibility of the user to ensure the GasCheck instrument has the sensitivity to detect the required gas before reaching potentially dangerous levels.

## 2.3 DISPOSAL

Disposal of the GasCheck G Series its, components, and any used batteries shall be in accordance with local and national safety and environmental requirements.

## 2.4 CALIBRATION

Calibration service is recommended on a yearly basis. LACO Technologies has an A2LA Accredited calibration lab which complies to ISO/IEC 17025-2005 and ANSI/NCSL Z540-1-1994. Also complies with ISO-9001 quality standard. Call LACO at 801-486-1004 for more information.

## 3. OVERVIEW

The GasCheck is a portable handheld gas detector instrument predominantly used for detecting gas leaks and can detect almost all gases to varying degrees. It is powered by standard AA size batteries and will accept both Alkaline and Nickel Metal Hydride (rechargeable) types.

The GasCheck uses thermal conductivity as its means of detecting gas which offers a robust sensor technology that requires practically no maintenance beyond annual servicing.

All GasCheck G Series models have an easy to use graphical interface with an intuitive keypad allowing simple function selection and adjustment. It can be upgraded to add features without the need to be returned to the supplier and without having to modify the internal firmware. It has an LCD display, LED indicator and audible sounder than indicates the detected signal.

*Table 1: GasCheck Specifications*

COMPONENT	DESCRIPTION
TEMPERATURE	0 to 50° C (32 to 122° F)
STORAGE TEMPERATURE	-25 to 70° C -(13 to 158° F)
INSTRUMENT CASE	Polyurethane
DIMENSIONS	L.390 x W.60 x H.50mm L (15.35" x W2.35" x 2.0")
WEIGHT	0.5 kg (1.0 lb)
INGRESS RATINGS	IP20
LENGTH OF LONG PROBE	300 mm *12")
DETECTION TYPE	Thermal conductivity
DETECTION TIME TO T90	1 sec (short probe) 9 sec (long probe)
CLEAR DOWN TIME	1 sec (short probe) 9 sec (long probe)
BATTERY TYPE	Alkaline or NiMH AA (qty 4)
BATTERY LIFE AT 20°C (68°F)	40 hours (20 hours when using the backlight

**Table 2: GasCheck Replacement Parts**

PART NUMBER	DESCRIPTION
A-08045	Long probe
A-08043	Short probe
1/BH-01	Replacement battery holder
08024CPC8	Nozzle
A-08029	Box Wrench
CM515.0-4101FAG/1	Leak Standard with Refillable Helium Reservoir, 5x10 <sup>-4</sup> cc/sec
CM515.0-410SFA0/1	Open Style Leak Standard for use with helium regulator and tank, 5x10 <sup>-4</sup> cc/sec

### 3.1 APPLICATIONS

Common applications include:

- Quality assurance: Testing seal integrity after product manufacture
- Laboratory applications: Detection of leaks from mass spectrometers and chromatograph equipment
- Industrial: Leaks from gas cylinders, pipe work and process equipment
- Medical: Testing of membrane materials and sealing of glove boxes
- Pneumatic: Valve seal testing.

### 3.2 UNITS OF MEASUREMENT

The GasCheck is calibrated against a 5 E-4/cc/s helium leak to allow volumetric readings and also a 5000ppm helium to allow measurement of concentrations.

**Table 3: Selectable Units of Measurement**

UNIT	DESCRIPTION
cc/sec	Cubic Centimeters per Second offers a reading that indicates the volume of gas escaping into atmosphere from a single point, i.e., leakage from a hold in a gas filled vessel or pipe.
ppm	Parts Per Million is a concentration reading. The GasCheck G will display the concentration being detected. However, it is more difficult to gauge the quantity of leakage.
mg/m3	Milligrams per meter cubed is also a unit that measures concentration. (See ppm above)
g/yr	Grams per Year is an alternative measure leak rate.

### 3.3 IMPORTANT NOTES

The GasCheck G Series range is NOT intrinsically safe, so it should not be used in potentially explosive environment. Intrinsically safe GasCheck instruments are available; please contact Portable Leak Detectors for more information.

- Ambient air pressure, heat, and humidity can also affect readings.
- The GasCheck G range is NOT “gas specific”, i.e., it cannot differentiate between gases.

### 3.4 PACKING LIST

Please remove all packing material and then check the content of the carry case against the list below before use. Should the instrument or any accessory appear damaged or missing, contact the instrument supplier for advise before use.

*Table 4: Packing List*

ITEM	QTY	DESCRIPTION	CHECK
1	1	GasCheck G instrument w/short probe and nozzle fitted	
2	1	Long Probe	
3	1	Box wrench to change probe	
4	1	Spare battery clip	
5	1	User manual	
6	1	Calibration certificate	
7	1	CD containing additional product information	



### 3.5 THERMAL CONDUCTIVITY

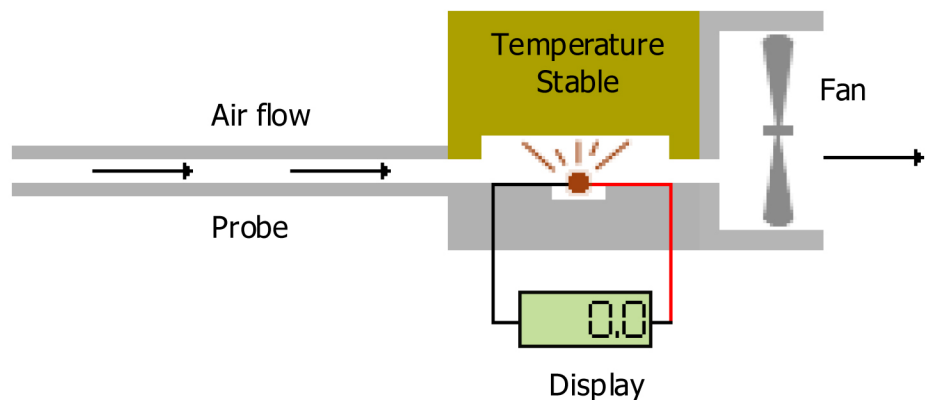
All gases conduct heat by varying amounts. If an object is heated and the source of the heat is then removed, the object will eventually cool down to match the ambient air temperature. This action occurs because the ambient air surrounding the object carries the excess heat into the surrounding atmosphere. This principle is also the same for objects that are cooler than the surrounding ambient air. Dissipation of heat into an air atmosphere is known and is a predictable rate. However, if the ambient air is replaced with an alternative gas like helium, the rate at which an object cools down changes.

If the object mentioned above had its environment replaced with pure helium it would cool down to the environment temperature about 6 times faster.



The GasCheck G Series contains a heated thermistor bead that transmits heat to a block of material that remains at a constant temperature. As air passes through the detector chamber a constant amount of heat passes from the bead to the block. Gases that are different to air will affect the rate at which heat transmits from the bead to the block. These rates of change are measured and displayed as leak rates.

The diagram below shows the basic functionality of the GasCheck Thermal Conductivity sensor. A fan draws a small flow of gas through the probe and into the sensing chamber. The thermistor bead heats up when electrical power is applied. As air passes through the cell a constant level of heat is transmitted to a Temperature Stable block through the air. This rate of heat transmission is used to Zero the instrument.



When gases with different thermal qualities pass through the chamber, the amount of heat being transmitted to the Temperature Stable block changes. These changes are measured, calculated and displayed on the GasCheck as leak rates or gas concentrations.

- NOTE** Some gases have similar thermal properties to that of the air, therefore the GasCheck can only detect larger concentrations of these gases.
- NOTE** Some gases have positive and other gases have negative signals. To simplify the instruments function, the GasCheck only display changes as positive readings.
- NOTE** The GasCheck G2 cannot differentiate between gases. Selecting a specific gas on the GasCheck G Series allows the instrument to calculate concentrations of that gas only if that gas is being detected.

### 3.6 INSTRUMENT MAIN MENU

Once the GasCheck has run through its START UP routine it will display its normal RUNNING SCREEN used when locating gas leaks. Before using the instrument, the various settings should be adjusted to suit the application.

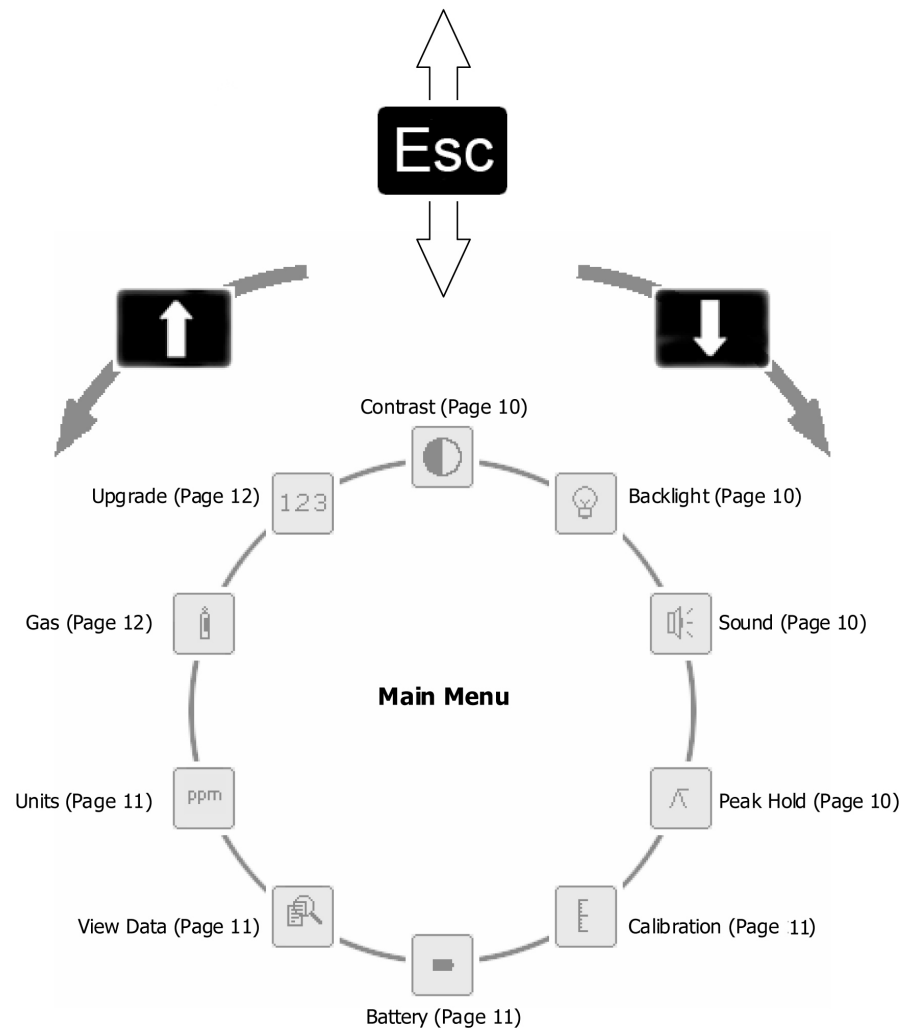
Pressing the ESC key while viewing this RUNNING SCREEN will access the instrument's MAIN MENU. Repeated pressing of the ESC returns the user back to the RUNNING SCREEN.

**Figure 1: Running Screen**



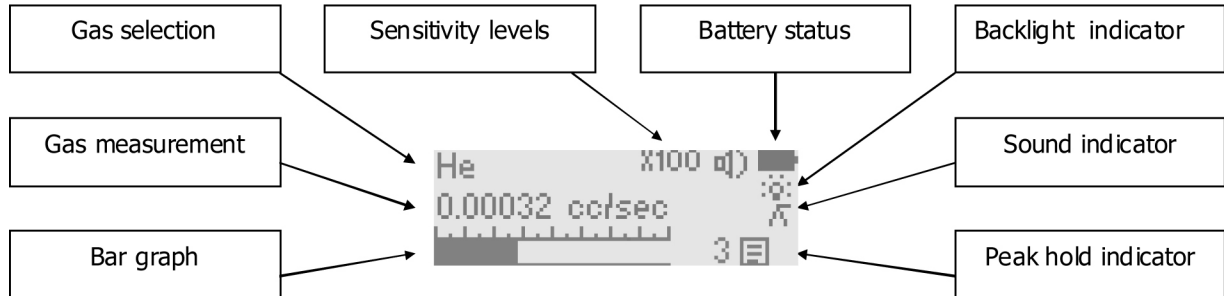
Running screen

**NOTE** The amount of functionality varies between models. See Table 1: GasCheck Specifications to find which functions relate to which model.



### 3.7 RUNNING SCREEN

The GasCheck displays the RUNNING SCREEN whenever the instrument is being used to detect leaking gas. The illustration below outlines the various information and icons.



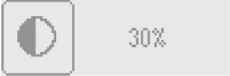



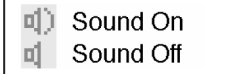

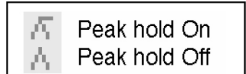

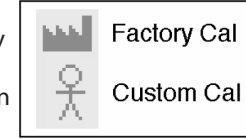

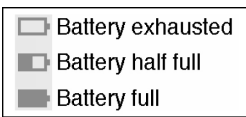
**Table 5: Running Screen Display**

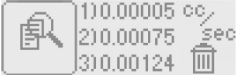

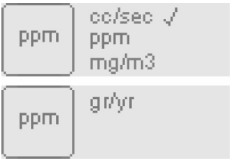


FUNCTION	DESCRIPTION
<b>GAS SELECTION</b>	The GasCheck G2 and G3 display the gas being measured in the top left of the RUNNING SCREEN. The GasCheck G2 will display the gas selected at the factory only. The G3 model has a range of gases that can be selected via an internal gas table.
<b>SENSITIVITY</b>	The GasCheck G has three sensitivity levels: <ul style="list-style-type: none"> <li>• X100 (times one hundred) — the most sensitive</li> <li>• X10 (times ten) — mid range</li> <li>• X1 (times one) — least sensitive</li> </ul>
<b>BATTERY STATUS</b>	When the battery symbol is filled in, the battery is full. When the battery symbol is outlined, the battery is exhausted.
<b>BACKLIGHT INDICATOR</b>	The backlight symbol shows the status of the backlight, even in bright daylight.
<b>GAS MEASUREMENT</b>	The GasCheck G2 and G2 measure the leak rate of gas leakage in whichever units are selected.
<b>SOUND INDICATOR</b>	The symbol shows if the sounder is on or off. If the semicircle on the right of the symbol is present, then the sound is switched on. If not, the sounder is switched off. The beep that occurs with each key press can not be switched off.
<b>BAR GRAPH</b>	The bar graph increases as gas is detected. This graph is not scaled and should be used for indication only. The GasCheck G1 has no measured units, so it relies on this bar graph to indicate leakage. When gas is detected and the bar graph has reached its maximum level, a different sensitivity level can be selected to give a wider detection range.
<b>PEAK HOLD INDICATOR</b>	When selected, peak hold displays the maximum measurement on the display. Pressing the ENTER key resets the reading but also logs the peak reading in memory.

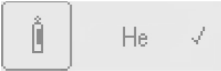
### 3.8 FUNCTIONS

The GasCheck instruments have a variation of functionality. Each of the functions listed below has a number to the right of the heading. This number indicates which function is included with each model.

**Table 6: GasCheck Function Comparison**

FUNCTION	DESCRIPTION	MODEL
<b>CONTRAST</b> 	<p>Use this function to adjust the contrast of the GasCheck LCD (liquid crystal display). Significant variations in ambient temperature conditions can cause the display to appear too dark or too light.</p> <p>When this function is selected, a number will appear to the right of the Contrast symbol as a percentage. Use the UP and DOWN keys to adjust the display the contrast to the desired level. When satisfied with the contrast level, press the ESC key to exit to the MAIN MENU.</p>	G1, G2, G3
<b>BACKLIGHT</b> 	<p>The user can select either BACKLIGHT ON or BACKLIGHT OFF. In daylight, the user may not be able to determine if the backlight is ON or OFF. A symbol on the main RUNNING SCREEN shows the status.</p> <p>When the backlight is ON, it significantly reduces battery life.  Backlight Off=40 hours of use  Backlight On=20 hours of use</p> 	G1, G2, G3
<b>SOUND</b> 	<p>The GasCheck has an audible sounder that increases frequency as detected gas levels increase. This sounder can be switched ON and OFF. Use the UP or DOWN key to move the "tick" to the desired position and then press the ESC key to return to the MAIN MENU.</p> <p>An audible beep can also be heard whenever the key pad is pressed. This beep cannot be switched off.</p> 	G1, G2, G3
<b>PEAK HOLD</b> 	<p>When selected, this function holds the highest detected reading on the display until the ENTER key is pressed.</p> <p>Select Peak ON or OFF using the UP or DOWN key and then press the ESC key to exit to the MAIN MENU.</p> <p>When using the GasCheck G, press the ENTER key to clear the held reading. The reading held on screen will be logged when the ENTER key is pressed.</p> <p>WARNING: ZEROing the instrument in a contaminated environment will result in false readings.</p> 	G2, G3
<b>CALIBRATION</b> 	<p>There are two Calibration settings that can be selected: FACTORY and CUSTOM. Factory calibration is carried out shortly after manufacture and cannot be adjusted. However, custom calibration offers the ability to calibrate the instrument between annual Factory calibrations. The GasCheck G ZEROs its reading at switch ON. Therefore, the Custom calibration routine has only one stage. For more information, see 5.1 CALIBRATION..</p> 	
<b>BATTERY SELECTION</b> 	<p>The GasCheck will operate using AA size batteries in either Alkaline (non rechargeable) or Nickel Metal Hydride (rechargeable).</p> <p>Select the battery type using the UP or DOWN key and then press the ESC key to exit to the MAIN MENU.</p> <p>Failing to select the correct battery type will not damage the instrument or affect its ability to detect gas. However, it will cause the battery indicator to read incorrectly.</p> 	

FUNCTION	DESCRIPTION	MODEL
<b>VIEW DATA</b> 	<p>The GasCheck instrument has the ability to data log 10 readings within its internal memory. To store a reading, press the ENTER key while on the main RUNNING SCREEN. When readings are stored in memory, a symbol will appear on the main viewing screen.</p> <p>When the memory is full, the Data symbol will flash. The stored data can be viewed by scrolling through the logged readings using the UP and DOWN keys.</p> <p><i>To delete the stored data:</i></p> <ol style="list-style-type: none"> <li>1. Press and hold the ENTER key.</li> <li>2. The TRASH CAN symbol will flash.</li> <li>3. Continue to hold the ENTER key until the data is deleted.</li> <li>4. Press the ESC key to exit to the MAIN MENU.</li> </ol> 	G2, G3
<b>UNITS</b> 	<p>GasCheck instruments have the capability of displaying detected readings in a variation of units: ppm, cc/s, mgm3, and g/yr.</p> <p>Use the UP and DOWN keys to select the desired unit, and then press the ESC key to exit to the MAIN MENU.</p> <p>NOTE: the Custom Calibration routine automatically selects the type a calibration depending on his setting. See 5.1 CALIBRATION.</p> <ul style="list-style-type: none"> <li>• CC/SEC = cubic centimeters per second offers a volumetric leak rate that directly measures the volume of a gas escaping from a given point. It is also known as ml/sec (milliliters per second). The GasCheck can typically detect helium leaks down to 0.0005 of a cubic centimeter per second.</li> <li>• PPM = Parts per million. This unit indicates a concentration but can't be used to quantify a volume of gas leakage.</li> <li>• MG/M3 = Milligrams per meter cubed. Like ppm, this unit is also a concentration, so it can't be used to quantify a volume of gas leakage.</li> <li>• G/YR = Grams per year offers an alternative volumetric leak rate that directly measures the volume of a gas escaping from a given point.</li> </ul>	G3
<b>DISPLAY</b> 	<p>The GasCheck has the capability of displaying a cc/sec and g/yr reading in either decimal or exponent form. (Readings in ppm and mg/m3 can only be displayed in decimal form.)</p> <p>To change the display:</p> <ol style="list-style-type: none"> <li>1. Use the UP and DOWN keys to select the desired unit.</li> <li>2. Press the ENTER key to display the next screen.</li> <li>3. Use the UP and DOWN keys to select the desired display and then press the ESC key twice to exit to the MAIN MENU.</li> </ol>	G3
<b>UPGRADE</b> 	<p>The GasCheck instrument can be upgraded using a simple upgrade code. This facility allows the GasCheck to be upgraded instantly by the user in the field. See Table 7: GasCheck Feature Comparison to compare the various features within each model.</p> <p>To upgrade a GasCheck, simply purchase an upgrade code from Portable Leak Detectors, enter the 12-digit number on the upgrade screen using the UP, DOWN, ENTER, and ESC keys. Once all 12 digits are entered correctly the instrument will automatically switch off.</p> <p>When the instrument is switched on, the new instrument model number will be displayed.</p>	G1, G2

FUNCTION	DESCRIPTION	MODEL
<b>GAS SELECTION</b> 	<p>The GasCheck is calibrated using helium gas at manufacture, however other gases can be detected and measured using a gas table within the instrument. Although GasCheck can't differentiate between gases, it can quantify other gases using response factors stored in its internal gas table. Gas groups 0, 1, 2, 3, and 4 offer a generic sensitivity.</p> <p>See Table 8: Gas Sensitivity to compare response factors for specific gases. For advice on gases not listed, please contact Portable Leak Detectors.</p> <p>To select an alternative gas:</p> <ol style="list-style-type: none"> <li>1. Use the UP and DOWN keys to select the desired gas</li> <li>2. Press the ENTER key to confirm the selection.</li> <li>3. A "tick" will appear.</li> <li>4. Press the ENTER or esc to exit to the MAIN MENU.</li> </ol> <p>If the gas to be detected does not appear in the instrument's internal gas table, then one of the five Gas Groups can be selected. Gas Groups have a variation of sensitivities. Group 1 is high sensitivity and Group 5 is low sensitivity. Gas groups allow the instrument to calculate leak rates with reasonable accuracy.</p>	

**Table 7: GasCheck Feature Comparison**

FEATURE	G1	G2	G3
CONTRAST	X	X	X
BACKLIGHT	X	X	X
SOUND	X	X	X
PEAK HOLD		X	X
CUSTOM CALIBRATION		X	X
BATTERY TYPE			X
DATA LOG			X
UNITS OF MEASUREMENT			X
GAS TABLE			X
UPGRADE	X	X	

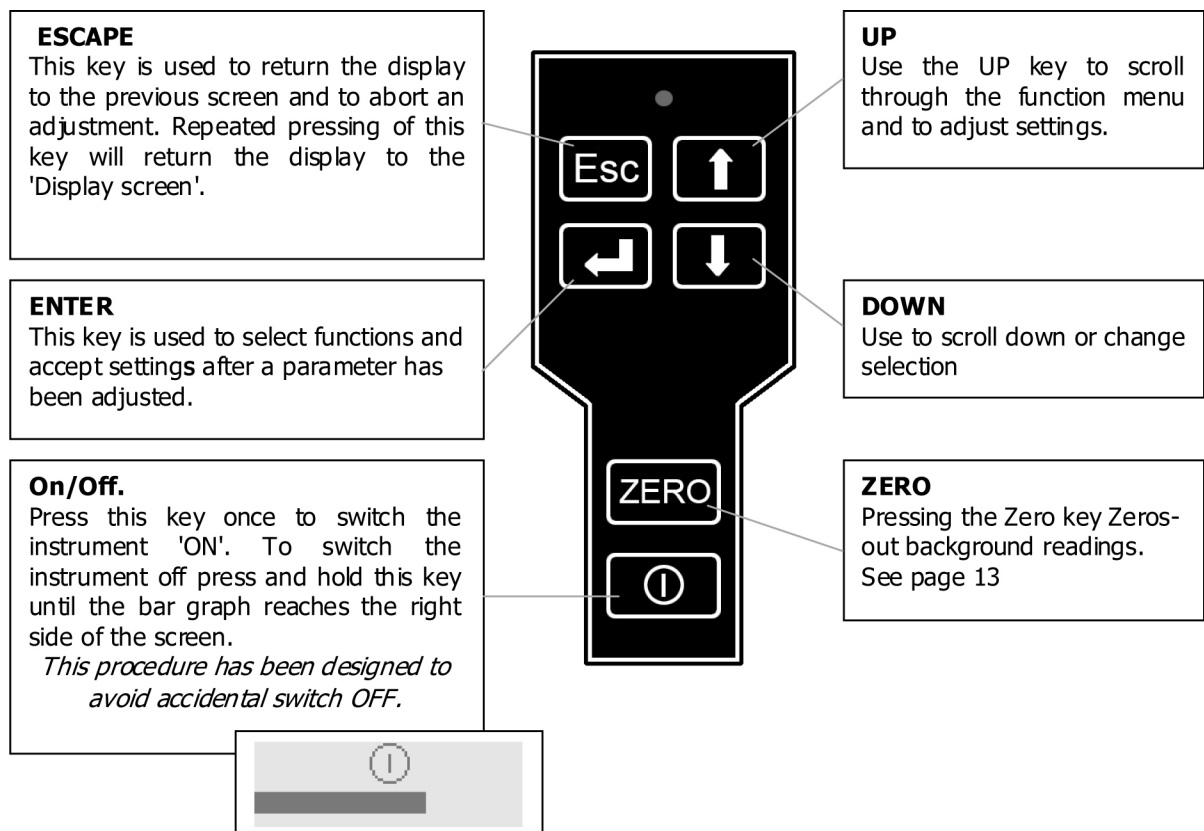
**Table 8: Gas Sensitivity**

NAME	ABBREV.	MAX. SENS. CC/SEC	MIN. SENS. CC/SEC
Hydrogen	H <sub>2</sub>	7.7 E-6	
Helium	He	1.0 E-5	
Refrigerant R12	R <sub>12</sub>	2.7 E-5	0.000027
Refrigerant R1301	R <sub>1301</sub>	2.4 E-5	0.000024
Refrigerant R134a	R <sub>134a</sub>	5.8 E-5	0.000028
Refrigerant R22	R <sub>22</sub>	2.6 E-5	0.000260
Refrigerant R11	R <sub>11</sub>	3.2 E-5	0.000032

NAME	ABBREV.	MAX. SENS. CC/SEC	MIN. SENS. CC/SEC
Sulphur Hexafluoride	SF <sub>6</sub>	2.2 E-5	0.000022
Carbon Dioxide	CO <sub>2</sub>	4.0 E-5	0.000040
Methane	CH <sub>4</sub>	2.9 E-5	0.000029
Argon	Ar	3.5 E-5 0	.000035
Oxygen	O <sub>2</sub>	2.9 E-5	0.000029
Refrigerant R502	R <sub>502</sub>	3.0 E-5	0.000030
Refrigerant R404a	R <sub>404a</sub>	3.2 E-5	0.000032
Refrigerant R407c	R <sub>407c</sub>	3.3 E-5	0.000033
Refrigerant R410a	R <sub>410a</sub>	3.2 E-5	0.000032
Refrigerant R507	R <sub>507</sub>	3.8 E-5	0.000038

## 4. BASIC OPERATION

All GasCheck G Series models have the same keypads. The following section explains the general functionality of each key.



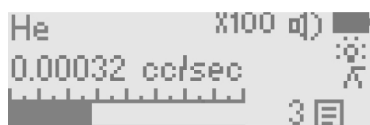


## 4.1 STARTUP ROUTINE

1. When the GasCheck first switches on, it will display its model number and the gas that it has been calibrated with.
2. A second screen then displays the instrument's serial number, the instrument's firmware version and web address.
3. A third screen appears to indicate the GasCheck is Zeroing its signal.
4. Once the Zero routine is complete, the instrument displays its running screen and is ready for use.

## 4.2 USING THE GASCHECK G SERIES

**WARNING:** Before switching on the GasCheck, ensure the ambient air is clean. The instrument automatically Zeros the sensor at switch on. After the instrument has run through the start up routine, adjust the instrument settings to the desired levels. Check the instruments sensitivity using a CalCheck or calibration kit.



1. Switch the GasCheck on by pressing the ON/OFF key. After the instrument has completed its Zero routine, it will show its normal running screen.

Ensure the instrument is on the X100 (times one hundred) range. While on the main running screen, use the UP and DOWN key to adjust between sensitivity ranges. X100 is the most sensitive, X1 is the least sensitive.

2. Gas leaks tend to occur at pneumatic joints or welded seams. To test for a leak, hold the GasCheck at a 45-degree angle to the object being tested and drag the probe along the seam or joint at a rate of approximately 25mm per second.
3. When a leak is detected, the bar graph will start to fill and the frequency of the audio output will increase but will reduce as the probe moves away from the leak. Return the probe to the suspected leaking area and move slowly along the same area until the leak is located. Once located, the probe should be held at the leak until the numeric reading stabilizes.
4. The bar graph offers a graphical indication only and should not be used to measure a leak. You may find that the numeric reading will continue to increase after the graph has completely filled. Should the instrument detect a leak that is too large for the range selected, the numerical screen will flash and display "9999". Use the UP or DOWN keys to adjust the instrument sensitivity.



Variation in temperature, humidity, and background gas may result in a constant level being detected on the instrument. To reset to Zero, hold the instrument away from the source of contamination and then press the ZERO key. The instrument's display will return to a near Zero reading.

The following things will affect the instrument's reading:

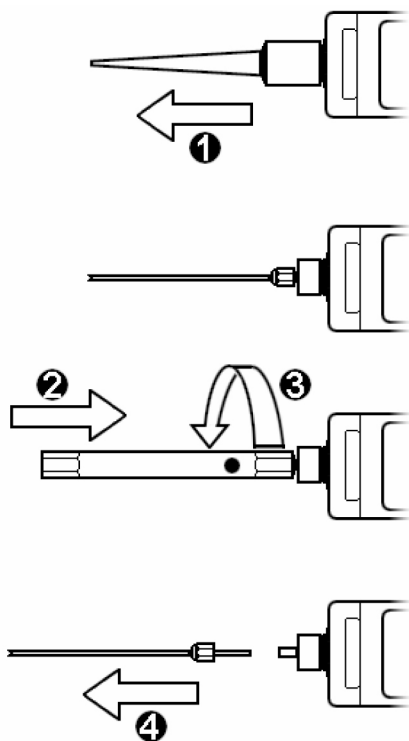
- CO<sub>2</sub> and moisture from the breath of the instrument user
- Barometric air pressure and background temperature
- Sources of cold and heat

### 4.3 PROBE OPTIONS

In some applications the gray probe cover may restrict access to the area under test. The gray probe cover can be removed by pulling it off the instrument. When the gray cover is removed, great care should be taken when using the instrument. Note the following precautions:

- Do not remove the semi-transparent probe sleeve. This sleeve ensures that the metal inner probe remains 1 mm from the surface of the test area, avoiding accidental dirt and moisture ingress.
- Do not touch the probe, especially the brass sensor housing. Heat from fingers can result in significant changes in signal causing false readings.
- Avoid placing the probe on wet or dirty surfaces. Blockage of the probe will result in instrument failure.

**Figure 2: Changing Probes**



Some applications may require a longer probe to gain access to pneumatic joints and seams to be tested. The GasCheck is also supplied with a 300mm probe that can be changed by the user.

To change probes, carefully do the following:

1. Switch the instrument to OFF.
2. Remove the outer gray probe cover (see 1).
3. Place the box wrench (supplied with the instrument) over the existing probe so the spanner fits over the brass nut (see 2), and unscrew the probe in a counterclockwise direction (see 3).
4. Withdraw the wrench and probe assembly (see 4).

To refit the short or the long probe, follow the steps above but in reverse order.

**CAUTION** When using the box wrench to tighten the probe nut, ensure the nut is firmly tightened. Do not use additional tools; they may damage the tread.

Should a probe become blocked, use dry, clean, compressed air to blow out the blockage from the instrument end of the probe.

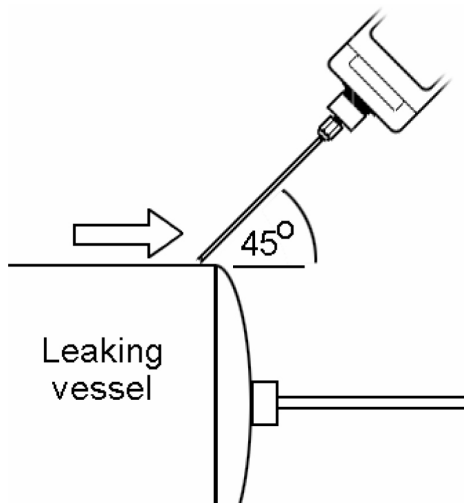
**WARNING** Ensure safety guidelines are adhered to when using compressed air.

## 4.4 DETECTING LEAKS

Hold the GasCheck in one hand and draw the instrument probe along the area to be checked at approximately 25 mm per second. When a leak is detected, retrace the route of the probe at a slower rate until the leak is located. Once located, hold the instrument over the leak until the measurement stabilizes. The reading can be logged by pressing the ENTER key.

Some readings may be larger than the instrument can detect and the measurement units will be replaced by "99999" on the display. In this case, use the UP or DOWN key to adjust the instrument sensitivity.

*Figure 3: Detecting Leaks*



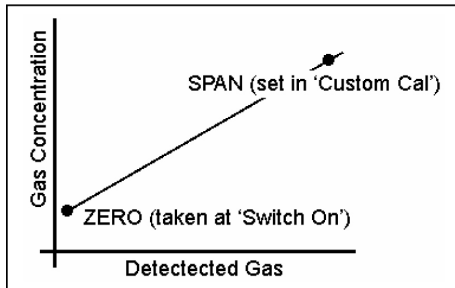
When detecting very small leaks, probe movement at a rate of 10mm per second may be required.

The outer gray probe cover can be removed to allow better access to restricted areas. If the outer probe is removed, please note the following:

- Avoid bending the inner probe. A bent probe will affect accuracy.
- To prevent probe blockage, avoid placing the probe in liquid or dirt.
- Care should be taken to ensure the brass sensor housing component remains at a constant temperature. Avoid touching the brass sensor block with fingers.
- The GasCheck can detect changes in humidity and carbon dioxide. Therefore, avoid breathing on the probe.
- The thin white tube that covers the inner probe should not be removed. This tube ensures a 1mm gap is maintained between the probe and the surface being tested.

## 5. MAINTENANCE

### 5.1 CALIBRATION



The GasCheck G Series has two selectable calibration settings: factory and custom. Factory calibration is carried out at Ion Science during the instrument's manufacture. It can be selected and used but cannot be changed.

The GasCheck is calibrated against a 5000 ppm helium concentration and a 0.0005cc/sec (5 E-4) helium leak rate.

Custom calibration gives the user the ability to calibrate the instrument. This setting may offer improved accuracy over the factory calibration if the barometric air pressure differs from that stated on the instrument's calibration certificate.

#### 5.1.1 SELECTING FACTORY OR CUSTOM CALIBRATION



To select either FACTORY CAL or CUSTOM CAL, select the calibration screen and move the up use the up and down keys to move the "tick" under the desired symbol, then press the ESC key to exit to the main menu.

Custom calibration can only be selected and used after the instrument has been calibrated by the user. To do this, move the "tick" under the CUSTOM CAL symbol and press the ENTER key.

The GasCheck requires either 5000 ppm helium concentration or a 0.0005cc/sec (5 E-4 cc/sec) leak rate as a reference. The GasCheck automatically selects the type of calibration media based on which unit the instrument has already selected.

If the GasCheck is used to detect leaks measured using "ppm or mg/m3" units, then the instrument must be calibrated using a 5000 ppm helium concentration.

If the GasCheck G is used to detect leaks measured using "cc/sec" unites, the instrument must be calibrated using a 0.005 cc/sec (5 E-4) helium leak.



#### 5.1.2 CALIBRATION PROCEDURE USING PPM UNITS

Please read this entire procedure before proceeding with this calibration routine.

1. Fill an empty (uncontaminated) sample bag with 5000 ppm helium gas before starting the calibration procedure. Also remove the outer gray probe from the GasCheck.
2. Select the CUSTOM CAL symbol from the instrument's menu. An option appears allowing the adjustment of the "ppm" value to ensure the instrument matches the gas concentration being used. Use the up and down keys to adjust between 4900 and 5100 ppm.

3. Ensure the instrument is in clean air and then press the ENTER key. The instrument will Zero. This will take a few seconds, but once complete a READY message will appear.
4. Insert the instrument's probe fully into the sample bag containing the gas and press the ENTER key. The instrument will automatically sequence through the cold and hot stages of calibration but when finished gives a summary of values.
5. Press the ENTER key to return back to the calibration option screen. Press the ESC key to start using the instrument or press the ENTER key to calibrate again.

**NOTE** To avoid errors in calibration, the following points should be noted:

- Avoid bending the inner probe as this will affect the GasCheck's accuracy
- The GasCheck can detect changes in humidity and carbon dioxide. Avoid breathing on the probe.
- Avoid pressurizing the sample bag. This will cause significant errors in reading.

### 5.1.3 CALIBRATION PROCEDURE USING CC/SEC UNITS

Please read this entire procedure before proceeding with this calibration routine.

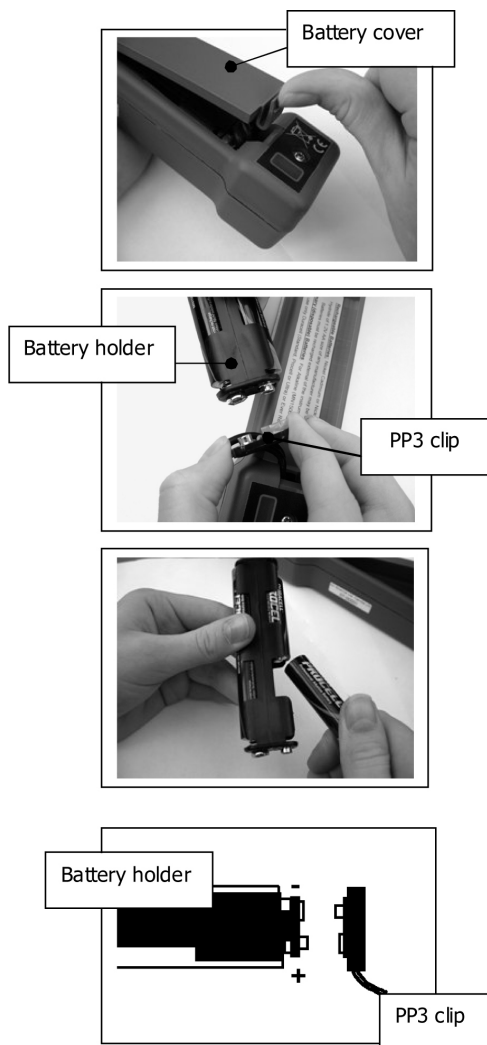
1. Check your LACO CalMaster™ Leak Standard to ensure the pressure reading matches the leak rate shown on the calibration stick. The pressure gauge may be installed on your leak standard or for open style leak standards the pressure gauge is set on helium regulator.
2. Select the CUSTOM CAL symbol from the instrument's menu.
3. Ensure the instrument is in clean air and then press the ENTER key. The instrument will Zero. This will take a few seconds but once complete, a READY message will appear.
4. Insert the instrument's probe into the CalMaster™ Leak Standard's outlet and press the enter key. The instrument will automatically sequence through the cold and hot stages of calibration. When finished, it gives a summary of values.
5. Pressing the ENTER key will return back to the calibration option screen. Press the ESC key to start using the instrument or press the ENTER key to recalibrate again.

**NOTE** The GasCheck can detect changes humidity and carbon dioxide. Avoid breathing on the probe.

**WARNING** Great care should be taken to ensure the calibration gas is neither pressurized or restricts flow to the instrument's probe. Changes in flow of gas to the sensor will result in significant errors in readings.

## 5.2 REPLACING BATTERIES

*Figure 4: Replacing Batteries*



Before using the GasCheck G instrument, ensure the batteries are fitted correctly or ensure NiMH (rechargeable) batteries are fully charged before use.

To fit or replace batteries you must first remove the battery cover from the rear of the instrument. This can be done by prying open the battery clip with a fingernail or screwdriver.

Removing the battery cover will reveal a battery hold which requires 4 x AA size batteries. Before removing old batteries or fitting new ones, unclip the battery holder from the instrument by prying apart the PP3 type clip as shown in the illustration.

Once the battery holder is disconnected from the instrument, the batteries can be removed or replaced. Care must be taken when refitting the batteries to ensure that they are the correct polarity. Polarity markings are molded onto the battery holder plastic.

The battery holder can be reconnected to the GasCheck by firmly pressing the two halves of the PP3 clip together. Care should be taken to ensure the polarity is correct. See the PP3 diagram (Figure 4).

The battery pack is then laid within the instrument and the battery cover refitted. Take care not to trap wires when refitting the battery cover.