



The Sampler

Motorized Sampling Pump

User Manual



Limited Warranty & Limitation of Liability

BW Technologies Ltd. (BW) warrants this product to be free from defects in material and workmanship under normal use and service for a period of two years, beginning on the date of shipment to the buyer. This warranty extends only to the sale of new and unused products to the original buyer. BW's warranty obligation is limited, at BW's option, to refund of the purchase price, repair, or replacement of a defective product that is returned to a BW authorized service center within the warranty period. In no event shall BW's liability hereunder exceed the purchase price actually paid by the buyer for the Product.

This warranty does not include:

- a) fuses, disposable batteries or the routine replacement of parts due to the normal wear and tear of the product arising from use;
- b) any product which in BW's opinion, has been misused, altered, neglected or damaged by accident or abnormal conditions of operation, handling or use;
- c) any damage or defects attributable to repair of the product by any person other than an authorized dealer, or the installation of unapproved parts on the product; or

The obligations set forth in this warranty are conditional on:

- a) proper storage, installation, calibration, use, maintenance and compliance with the product manual instructions and any other applicable recommendations of BW;
- b) the buyer promptly notifying BW of any defect and, if required, promptly making the product available for correction. No goods shall be returned to BW until receipt by the buyer of shipping instructions from BW; and
- c) the right of BW to require that the buyer provide proof of purchase such as the original invoice, bill of sale or packing slip to establish that the product is within the warranty period.

THE BUYER AGREES THAT THIS WARRANTY IS THE BUYER'S SOLE AND EXCLUSIVE REMEDY AND IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. BW SHALL NOT BE LIABLE FOR ANY SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES OR LOSSES, INCLUDING LOSS OF DATA, WHETHER ARISING FROM BREACH OF WARRANTY OR BASED ON CONTRACT, TORT OR RELIANCE OR ANY OTHER THEORY.

Since some countries or states do not allow limitation of the term of an implied warranty, or exclusion or limitation of incidental or consequential damages, the limitations and exclusions of this warranty may not apply to every buyer. If any provision of this warranty is held invalid or unenforceable by a court of competent jurisdiction, such holding will not affect the validity or enforceability of any other provision.

BW Technologies Ltd.
2840 – 2nd Ave. SE
Calgary, AB T2A 7X9
Canada

BW Technologies Inc. (America)
3279 West Pioneer Parkway
Arlington, TX 76013
USA

BW Europe Ltd.
101 Heyford Park
Upper Heyford, Oxfordshire OX25 5HA
United Kingdom

Table of Contents

Title	Page
Introduction.....	1
Contacting BW Technologies.....	2
Safety Information - Read First.....	2
Getting Started.....	5
Activating the Sampler.....	9
Normal Operation.....	9
Operation.....	9
Guidelines.....	9
Standard Hose Configuration.....	10
Sample Tube Connections.....	10
Block the Airflow.....	11
Deactivating the Sampler.....	11
Alarms.....	12
Low Flow Alarm.....	12
Low Battery Alarm.....	13
System Fault Alarm.....	13
Calibration.....	14
Calibration Pass.....	14
Calibration Fail.....	14
Maintenance.....	15
Replacing the Batteries.....	15
Replacing a Filter.....	17
Draining the Water Trap.....	18
If the Sampler Does Not Work.....	19
Replacement Parts and Accessories.....	21
Specifications.....	22

List of Tables

Table	Title	Page
	The Sampler	vi
1.	International Symbols	4
2.	The Sampler	6
3	LED Descriptions	7
4.	Pushbuttons	8
5.	Standard Hose Configuration	10
6.	Replacing the Batteries.....	16
7.	Replacing a Filter	17
8.	Draining the Water Trap	18
9.	Troubleshooting Tips	19
10.	Replacement Parts and Accessories.....	21

List of Figures

Figure	Title	Page
1.	The Sampler	6
2.	LED Descriptions	7
3.	Standard Hose Configuration	10
4.	Sample Tube Connections	10
5.	Replacing the Batteries	16
6.	Replacing a Filter	17
7.	Draining the Water Trap	18
8.	Rear Assembly Screws	20

CAUTION: FOR SAFETY REASONS, THIS EQUIPMENT MUST BE OPERATED AND SERVICED BY QUALIFIED PERSONNEL ONLY. READ AND UNDERSTAND THE USER MANUAL COMPLETELY BEFORE OPERATING OR SERVICING.

The Sampler

Order Number	Description
GA-SP01	Motorized sampling pump with rigid probe and sample tubing
GA-SP02	Motorized sampling pump with rigid probe and sample tubing (Europe)

The Sampler

Introduction

⚠ Warning

To ensure your personal safety, read Safety Information before you use the sampler.

The Motorized Sampling Pump (“the sampler”) is a spot sampling device that can be used with most BW single and multiple gas detectors. An internal motorized pump transports potentially hazardous gasses from a sample area to a detector.

The sampler is an accessory for a personal safety device. It is your responsibility to respond properly to alarm conditions.

Contacting BW Technologies

To contact BW Technologies, call:

USA: 1-888-749-8878

Canada: 1-800-663-4164

Europe: +44 (0) 1869 233004

Middle East: (971) 4 8871766

China: +011-852-2974-1783

South East Asia: +65-6872-1629

Australia: 61-7-3818-8244

Anywhere in the world: +1-403-248-9226

Address correspondence to:

**BW Technologies Ltd.
2840 – 2 Avenue S.E.
Calgary, AB T2A 7X9
CANADA**

Or visit us on the World Wide Web: www.gasmonitors.com

ISO 9001

Safety Information - Read First

Use the sampler only as specified in this manual, otherwise the protection provided by the sampler may be impaired.

International symbols used on the sampler and in this manual are explained in Table 1.

Read the **Caution** statements on the following pages before using the sampler.





Note

This instrument contains batteries. Do not mix with the solid waste stream. Spent batteries should be disposed of by a qualified recycler or hazardous materials handler.

⚠ Cautions

- ⇒ **Warning: Substitution of components may impair Intrinsic Safety.**
- ⇒ **This product is not a gas detector.**
- ⇒ **Do not use the sampler if it is damaged. Before you use the sampler, inspect the case. Look for cracks or missing parts.**
- ⇒ **If the sampler is damaged or something is missing, contact BW Technologies immediately (see page 2).**
- ⇒ **Confirm that the cowl is locked in place before you operate the sampler.**
- ⇒ **Use only recommended AA alkaline or NiMH batteries properly charged and installed in the sampler case. (See the section Replacement Parts and Accessories.)**
- ⇒ **Charge NiMH batteries using the recommended charger only. Do not use any other charger. Failure to observe this precaution could lead to fire or explosion.**
- ⇒ **Do not change or charge batteries in a hazardous location. Doing so will impair the intrinsic safety of the unit and may lead to fire or explosion.**
- ⇒ **Read and observe all instructions and precautions in the literature provided with the charger. Failure to do so may result in fire, electric shock or other forms of personal injury or property damage.**
- ⇒ **Do not expose the sampler to electrical shock and/or severe continuous mechanical shock.**
- ⇒ **The sampler warranty will be void if the unit is disassembled, adjusted or serviced by non-BW Technologies personnel.**
- ⇒ **Do not immerse the sampler in liquids.**
- ⇒ **Confirm that the water trap is empty.**

Table 1. International Symbols

Symbol	Meaning
	Approved to both U.S. and Canadian Standards by the Canadian Standards Association
ATEX	Conforms to European ATEX directives
	European Explosive Protection
CE	Conforms to European Union directives

Getting Started

Airflow is continuously monitored and controlled by the sampler. It occasionally adjusts motor speed to compensate for changes in environmental and sampling conditions and automatically enters calibration mode, when needed. You can verify the correct operation at any time by blocking the sampler's flow and noting a low flow alarm state.

The items listed below are included with your sampler. If the sampler is damaged or something is missing, contact the place of purchase immediately.

- Batteries (2 replaceable AA alkaline cells)
- Short sample tube, (4.65 in./11.81 cm)
- Medium sample tube, (10.25 in./26.00 cm)
- Sampling hose, (10 ft./3 m). Blue stone coarse particulate filter attached
- Attachment hose, (3 ft./1m)
- Particulate filter, Qty. 2
- Quick reference card
- User Manual

To order replacement parts, see the section **Replacement Parts and Accessories**.

The sampler is shipped with the short sample tube installed. The **Operation** section describes how to install another sample tube. The **Maintenance** section describes how to install the batteries.

To become familiar with the features and functions of the sampler, study the following figures and tables:

- Figure 1 and Table 2 describe the sampler's components.
- Figure 2 and Table 3 describe the sampler's LEDs.
- Table 4 describes the sampler's pushbuttons.

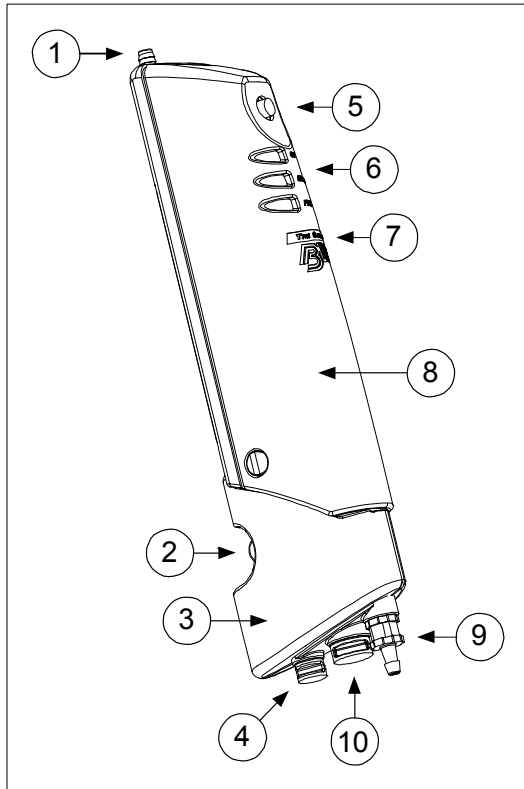



Figure 1. The Sampler

Table 2. The Sampler

Item	Function
①	Short sample tube (inlet)
②	Block trigger 
③	Water Trap
④	Drain plug
⑤	Activation button ○
⑥	LEDs
⑦	Audible alarm
⑧	Cowl
⑨	Tube fitting (outlet)
⑩	Filter plug

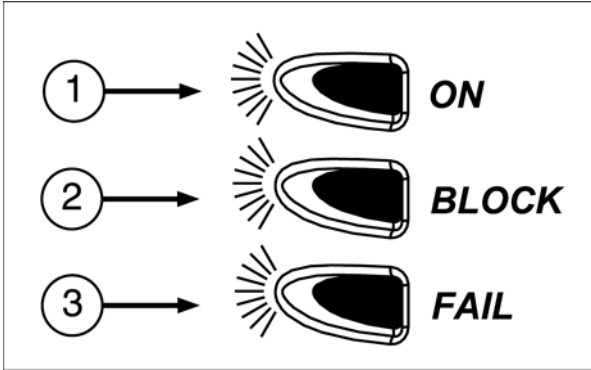




Figure 2. LED Descriptions

Table 3. LED Descriptions

Item	Function
①	The green ON LED indicates the sampler is operating properly.
②	The yellow BLOCK LED prompts you to block the airflow.
③	The red FAIL LED indicates that the sampler is in an error condition.

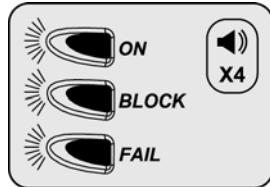
Table 4. Pushbuttons

Pushbutton	Description
 ON/OFF/CALIBRATION	<ul style="list-style-type: none">• To turn on the sampler, press ○.• To initiate a calibration, confirm the sampler is on and then press ○ and hold for 6 seconds. There will be a beep, the sampler will turn off and upon the next startup the sampler will enter calibration mode.• To turn off the sampler, press ○ and hold for 2 seconds.
 BLOCK AIRFLOW	<ul style="list-style-type: none">• To block airflow through the sampler firmly depress the block trigger <p>Note: Airflow can also be blocked by temporarily kinking the hose or covering the end of the rigid tube.</p>

Activating the Sampler

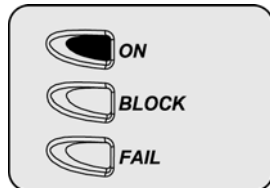
⇒ To activate the sampler, press ○.

All 3 LEDs will flash and the audible alarm will emit 4 beeps. When the sampler is activated for the first time, it will enter calibration mode. See the **Calibration** section.



Normal Operation

During normal operation the green **ON** LED will be lit and the motor will be running.



Operation

Guidelines

When operating the sampler, adhere to the following guidelines:

- Confirm that all hoses are properly attached to the sampler
- Confirm that there are no leaks in the system before obtaining a sample.

For the sample to reach the detector, allow approximately 3 seconds per 1 ft./0.3 m of hose. Consult your detector manual for detector response time.

Standard Hose Configuration

Table 5. Standard Hose Configuration

Item	Description
①	Attachment hose
②	Sampling hose

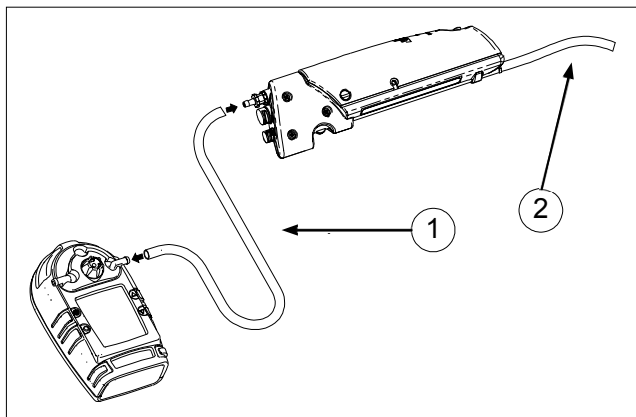


Figure 3. Standard Hose Configuration

Sample Tube Connections

The sampler is shipped with the short sample tube installed.

To remove the installed sample tube, grasp the end of the tube and pull straight out. Insert the new sample tube through the enclosure and into the gasket opening. To ensure a proper seal, the end of the tubing should be inserted until firm resistance is felt.

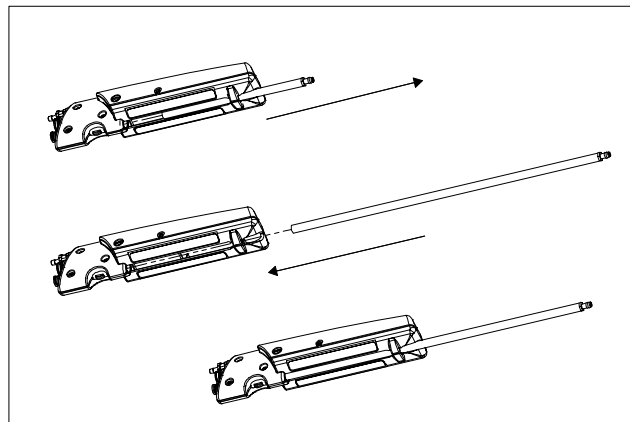



Figure 4. Sample Tube Connections

Block the Airflow

When you block the airflow to the sampler you are confirming that the sampler is working correctly and there are no leaks in the system.

There are a couple of ways for you to test the airflow of the sampler:

- Press and hold the block trigger .
- Kink the sampling or attachment hose.

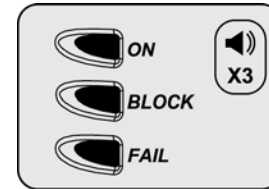
If the **FAIL** LED blinks and the alarm beeps (while the airflow is blocked), then the sampler is operating correctly. If it does not, reconnect the hose/tube to check for leaks.

Note: We recommend that you perform a block test once the sampler is activated.

Deactivating the Sampler

⇒ To turn off the sampler, press  and hold for 2 seconds.

The audible alarm beeps 3 times, all LEDs light up and then the sampler turns off.

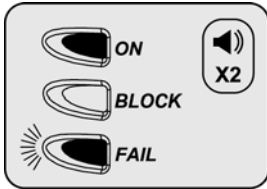


Note: If you reactivate the sampler within a 30-minute period, it will resume normal operation (i.e., the sampler will not enter calibration).

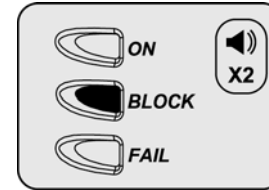
Alarms

Low Flow Alarm

If the sampler detects a low flow situation, the red **FAIL** LED will flash and the audible alarm will beep twice.



The sampler will continue in this mode for approximately 10 seconds. This gives you time to remove any blockage in the line. If the condition does not change, the sampler will prompt you for a block.

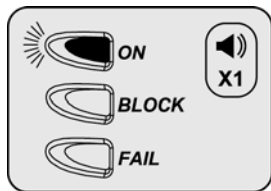


If the sampler detects the expected airflow it returns to normal operation. If the sampler does not detect the expected airflow it returns to the low flow alarm state until the airflow recovers.

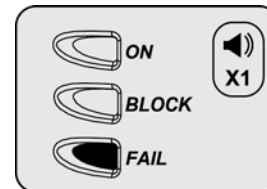
Low Battery Alarm

Note: Once the Low Battery Alarm has been activated you have approximately 20 minutes before the sampler turns off.

The sampler tests the batteries on activation and continuously thereafter. If the battery voltage is low, the sampler activates the Low Battery Alarm. The audible alarm will beep once every 20 seconds and the green **ON** LED will flash.



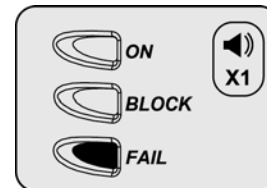
The Low Battery Alarm continues until you replace the batteries or the battery power nears depletion. If the battery voltage drops too low, the audible alarm beeps once the red **FAIL** LED lights and the sampler turns off.



See the section **Replacing the Batteries**.

System Fault Alarm

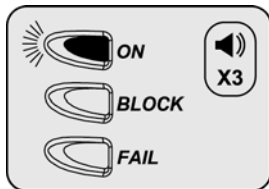
If the sampler detects a system fault the red **FAIL** LED will light and the audible alarm will beep.



Press to clear the alarm. The sampler will automatically enter the calibration mode. If the sampler passes calibration it will enter normal operation mode. If calibration fails see the section **If the Sampler Does Not Work**.

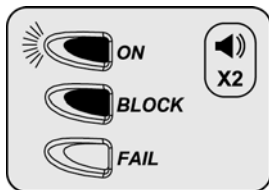
Calibration

Upon startup, the audible alarm emits three beeps, the pump activates at a high speed and the green **ON** LED flashes.



After one second, the pump speed adjusts to its normal rate.

The audible alarm then emits a beep and a tone and the yellow **BLOCK** LED lights. At this time, block the airflow (see the section, **Block the Airflow**).



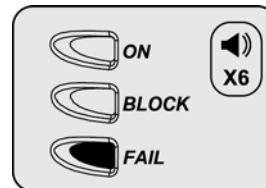
Note: To initiate a calibration, confirm the sampler is on then press and hold for 6 seconds. There will be a beep, the sampler will turn off and upon the next startup the sampler will enter calibration mode.

Calibration Pass

When the sampler passes calibration the audible alarm emits 3 beeps and the sampler enters normal operation mode.

Calibration Fail

If the sampler fails calibration, the audible alarm emits 6 beeps, the red **FAIL** LED lights and the sampler turns off. See the section **If the Sampler Does Not Work**.



Note: To initiate a calibration, confirm the sampler is on then press and hold for 6 seconds. There will be a beep, the sampler will turn off and upon the next startup the sampler will enter calibration mode.

Maintenance

To keep the sampler in good operating condition, perform the following basic maintenance as required:

- Keep an operations log of all maintenance and fault events.
- Clean the exterior with a soft damp cloth. Do not use solvents, soaps or polishes.
- Do not immerse the sampler in liquids.
- Confirm that the filter is free of dirt and replace it if necessary.
- Confirm that the water trap is empty.

Replacing the Batteries

⚠ Warning

To avoid personal injury:

- ⇒ **Replace the batteries as soon as the sampler indicates a Low Battery Alarm.**
- ⇒ **Use only batteries recommended by BW Technologies to prevent damage or personal injury and maintain intrinsic safety.**
- ⇒ **Use only approved AA alkaline or charged AA NiMH batteries, properly installed in the sampler. See the Specifications section for approved batteries.**
- ⇒ **Charge batteries using only a recommended charger. Do not use any other charger. Failure to observe this precaution could lead to fire or explosion.**
- ⇒ **Do not change or charge batteries in a hazardous location. Doing so will impair the intrinsic safety of the unit, and may lead to fire or explosion.**

If the sampler is on, turn off the sampler before replacing the batteries.

1. Loosen but do not remove the #4-40 x 3/8" button head screw on the side of the sampler. The screw may not be included in certain regions.
2. Spread the cowl to disengage it from the body of the sampler.
3. Rotate the cowl upwards.
4. Remove the two batteries.
5. Install new batteries, observing polarity.
6. Attach the cowl.
7. Rotate the cowl downward until it snaps into position. Tighten the #4-40 x 3/8" button head screw.

Table 6. Replacing the Batteries

Item	Description
①	#4-40 x 3/8" button head screw (may not be included in certain regions)
②	Cowl
③	Batteries

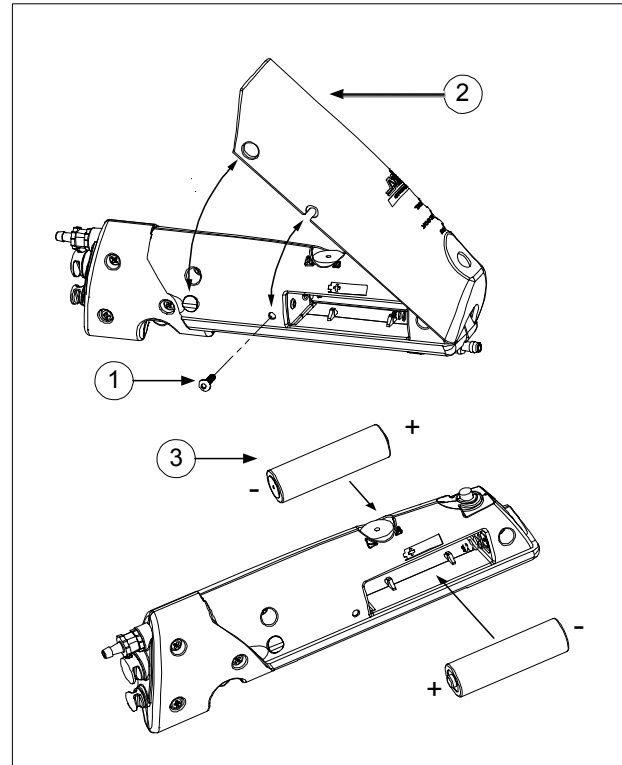


Figure 5. Replacing the Batteries

Replacing a Filter

The filter will need to be changed when it becomes clogged with dirt.

1. Remove the filter plug assembly from the sampler.
2. Remove the clogged filter and insert a new filter, ensuring that the filter is firmly seated into the plug and the open end of the filter is facing out.
3. Insert the filter plug assembly into the sampler, ensuring the filter enters the gasket filter opening.

Table 7. Replacing a Filter

Item	Description
①	Filter plug
②	Filter
③	Open end of filter
④	Filter plug assembly
⑤	Gasket filter opening

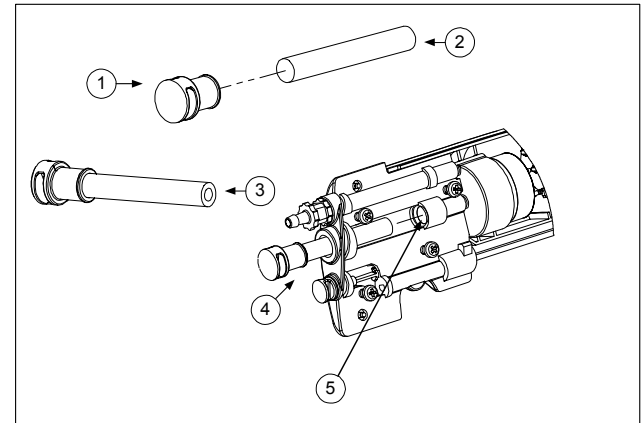


Figure 6. Replacing a Filter

Draining the Water Trap

Periodically, the water trap will need to be emptied.

Pull open the drain plug and shake any water out of the water trap. Replace the plug when complete.

Table 8. Draining the Water Trap

Item	Function
①	Water trap
②	Drain plug

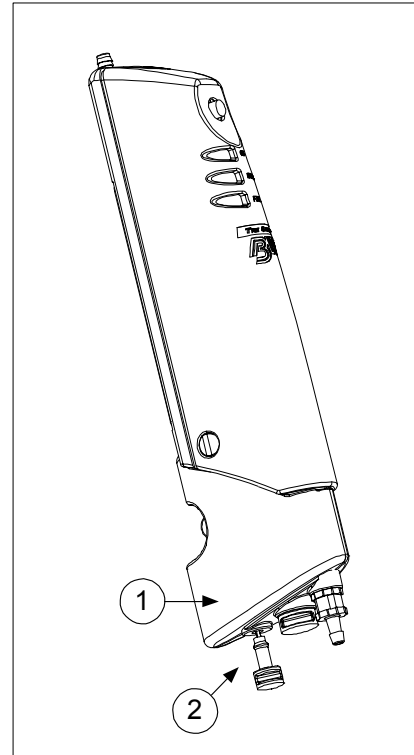


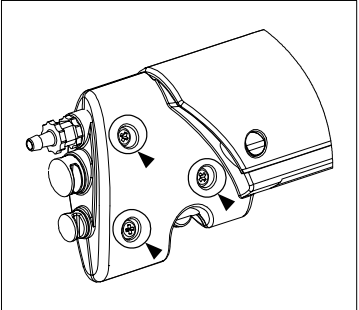
Figure 7. Draining the Water Trap

If the Sampler Does Not Work

If you encounter a problem, calibrate the sampler. If this does not solve the problem follow the solutions listed in Table 9. If you still are unable to correct the problem, contact BW Technologies using one of the numbers on page 2

Table 9. Troubleshooting Tips

Problem	Possible Cause	Solution
Sampler does not turn on.	No batteries. Depleted batteries. Damaged or defective sampler.	→ Install batteries. → Replace batteries. → Contact BW (see page 2).
Continuous low flow alarm. System fault alarm.	Extreme environmental change has formed condensation in the pump mechanism.	→ Wait approximately 15 minutes for the condensation in the sampler to clear.
Sampler automatically turns off.	Automatic Shutdown feature activated due to weak batteries.	→ Replace batteries.

Problem	Possible Cause	Solution
<p data-bbox="121 210 494 259">Sampler turns off with red FAIL LED flashing.</p>  <p data-bbox="134 712 510 736">Figure 8. Rear Assembly Screws</p>	<p data-bbox="555 210 967 259">A blocked state was not triggered during calibration.</p> <p data-bbox="555 327 877 351">There is water in the water trap.</p> <p data-bbox="555 362 775 387">Filter is in backwards.</p> <p data-bbox="555 490 724 515">The filter is dirty.</p> <p data-bbox="555 526 944 575">The filter assembly or drain plug is not installed.</p> <p data-bbox="555 586 893 611">Rear assembly screws are loose.</p> <p data-bbox="555 707 727 732">Pump has failed.</p>	<ul style="list-style-type: none"> <li data-bbox="1011 215 1391 315">→ Activate the sampler. During calibration block the airflow of the sampler when prompted to by the yellow BLOCK LED. <li data-bbox="1011 333 1267 358">→ Empty the water trap. <li data-bbox="1011 369 1423 474">→ Remove the filter plug assembly and orient the filter so the open end is facing away from the filter plug. Re-insert the filter plug assembly. <li data-bbox="1011 490 1228 515">→ Replace the filter. <li data-bbox="1011 526 1404 575">→ Install the filter assembly and drain plug. <li data-bbox="1011 586 1426 642">→ Tighten rear assembly screws as per Figure 8. <li data-bbox="1046 647 1426 696">Note: Do not tighten greater than 3.0 in.-lb. <li data-bbox="1011 712 1315 736">→ Contact BW (see page 2).

Replacement Parts and Accessories

⚠ Warning

To avoid personal injury or damage to the sampler, use only the specified replacement parts.

To order parts or accessories listed in Table 10, contact BW Technologies. (See page 2.)

Table 10. Replacement Parts and Accessories

Model No.	Description	Qty
GAMIC-V-CHRG1	12V vehicle charger and 4 AA NiMH batteries	1
GAMIC-C01-K	110 VAC 4-port charger and 4 AA NiMH batteries	1
GAMIC-C01-K-(xx)	220 VAC 4-port charger* and 4 AA NiMH batteries	1
SP-T2-S	Standard rigid sample tube with barbed fitting (4.65 in./11.81 cm)	1
SP-T2-M	Standard rigid sample tube with barbed fitting (10.25 in./26.00 cm)	1
SP-T1-2	Rigid sample probe	/ft. /0.3m
D4-PF-1	Blue stone coarse particulate filter	1

Model No.	Description	Qty
M1806	Flexible sampling hose	/ft. /0.3m
SP-PF-1	Sampler particulate filters	5
M2437K	#4-40 x 3/8" button head screw	10

**Add suffix (-UK) for United Kingdom mains plug, (-EU) for European mains plug, (-AU) for Australian mains plug.*

Specifications

Operating Humidity: 5% to 95% relative humidity
(non-condensing)

Sample Flow Rate: Typical 300 ml/min

Sample Distance: 50ft/15.2m maximum recommended.

Sample Delay Time: 3 seconds per 1ft./0.3m.

Connections: Outlet 1/8 in. (3.175 mm) barbed fitting for soft hose.

Inlet 1/8 in. (3.175 mm) barbed fitting for soft hose or 1/4 in. (6.35 mm) O.D. for rigid tube.

Weight: 6.2 oz./175 g

Dimensions: 7.4 x 1.3 x 2.1 in./18.8 x 3.35 x 5.4 cm

Visual Alarm: Three high-intensity LEDs

Warning Conditions: Low flow, low battery, system fault

Typical Battery Life: Alkaline, NiMH 30 hours
(at +25°C/77°F)

Altitude: Up to 9843 ft./3000 m

Pollution Degree: 2

Installation Category: I

Approved Batteries:

North America

Alkaline: **Temperature Code**

Duracell MN1500 150°C

Energizer E91 163°C

NiMH rechargeable:

Quest Platinum HGAAC1800G 211.4°C

Quest HG1600AACS 199°C

Energizer NH15 205°C

Maha Powerex 1700 mAh MH-AA170 192°C

Maha Powerex 1800 mAh MH-AA180 201.1°C

Yuasa Delta 1300 mAh DHA1400AA 209°C

Yuasa Delta 1500 mAh DHA1600AAC 204.4°C

Worst Case Temperature Code:

Alkaline 163°C

NiMH 212°C

Ambient -20°C ≤ Ta ≤ +50°C

Europe

Alkaline: **Temperature Code**

Duracell MN1500 T4

NiMH rechargeable:

Quest HG1600AACS T3

Worst Case Temperature Code:

Alkaline 129.8°C

NiMH 189°C

Ambient -20°C ≤ Ta ≤ +40°C

Battery Charger (optional): Quest™ Q2 4-port rapid NiMH battery charger with country-specific mains adapter

Charge Time: 1-3 hours

Approvals: Approved by CSA to both U.S. and Canadian Standards.

Class I, Division 1, Group A, B, C, and D;

Class I, Zone 0, Group IIC

ATEX: CE 0539 Ⓢ II 2 G KEMA 03ATEX1500

EX Approval: EEx ia IIC

CE: European Conformity

ABS Type Approved VA-348-169-X



D2112/1 English

iERP: 114412

© BW Technologies 2003, all rights reserved. Printed in Canada.

All product names are trademarks of their respective companies.

