



**INSTRUMENTS**

# **RP-2009 Pump for the GX-2009 Operator's Manual**

***Part Number: 71-0267RK***

***Revision: P4***

***Released: 10/26/18***

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## Product Warranty

RKI Instruments, Inc. warrants gas alarm equipment sold by us to be free from defects in materials, workmanship, and performance for a period of one year from date of shipment from RKI Instruments, Inc. Any parts found defective within that period will be repaired or replaced, at our option, free of charge. This warranty does not apply to those items which by their nature are subject to deterioration or consumption in normal service, and which must be cleaned, repaired, or replaced on a routine basis. Examples of such items are:

- a) Absorbent cartridges
- b) Pump diaphragms and valves
- c) Fuses
- d) Batteries
- e) Filter elements

Warranty is voided by abuse including mechanical damage, alteration, rough handling, or repair procedures not in accordance with the operator's manual. This warranty indicates the full extent of our liability, and we are not responsible for removal or replacement costs, local repair costs, transportation costs, or contingent expenses incurred without our prior approval.

*THIS WARRANTY IS EXPRESSLY IN LIEU OF ANY AND ALL OTHER WARRANTIES AND REPRESENTATIONS, EXPRESSED OR IMPLIED, AND ALL OTHER OBLIGATIONS OR LIABILITIES ON THE PART OF RKI INSTRUMENTS, INC., INCLUDING BUT NOT LIMITED TO, THE WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT SHALL RKI INSTRUMENTS, INC. BE LIABLE FOR INDIRECT, INCIDENTAL, OR CONSEQUENTIAL LOSS OR DAMAGE OF ANY KIND CONNECTED WITH THE USE OF ITS PRODUCTS OR FAILURE OF ITS PRODUCTS TO FUNCTION OR OPERATE PROPERLY.*

This warranty covers instruments and parts sold to users by authorized distributors, dealers, and representatives as appointed by RKI Instruments, Inc.

We do not assume indemnification for any accident or damage caused by the operation of this gas monitor, and our warranty is limited to the replacement of parts or our complete goods.

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## Table of Contents

Overview .....	4
Specifications.....	4
Description.....	5
Pump Unit.....	6
Rubber Sample Nipple .....	6
Optional Hose & Probe.....	7
Normal Operation.....	7
Alarms.....	13
Maintenance.....	13
Replacing the Battery.....	13
Replacing the Cotton Dust Filter .....	13
Replacing the Hydrophobic Disk Filter and Wire Mesh Disk.....	14
Parts List .....	15

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***WARNING: Understand manual before operating and for proper battery type. Substitution of components may impair intrinsic safety. To prevent ignition of a hazardous atmosphere, batteries must only be changed in an area known to be nonhazardous. Not tested in oxygen enriched atmospheres (above 21%).***

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***CAUTION: Read and understand the GX-2009 Operator's Manual before using the RP-2009.***

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## Overview

This manual describes the RP-2009 pump. This manual also describes how to operate the RP-2009 with the GX-2009 and how to maintain the RP-2009. A parts list at the end of this manual lists replacement parts and accessories for the RP-2009.

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## Specifications

Table 1 lists specifications for the RP-2009 pump.

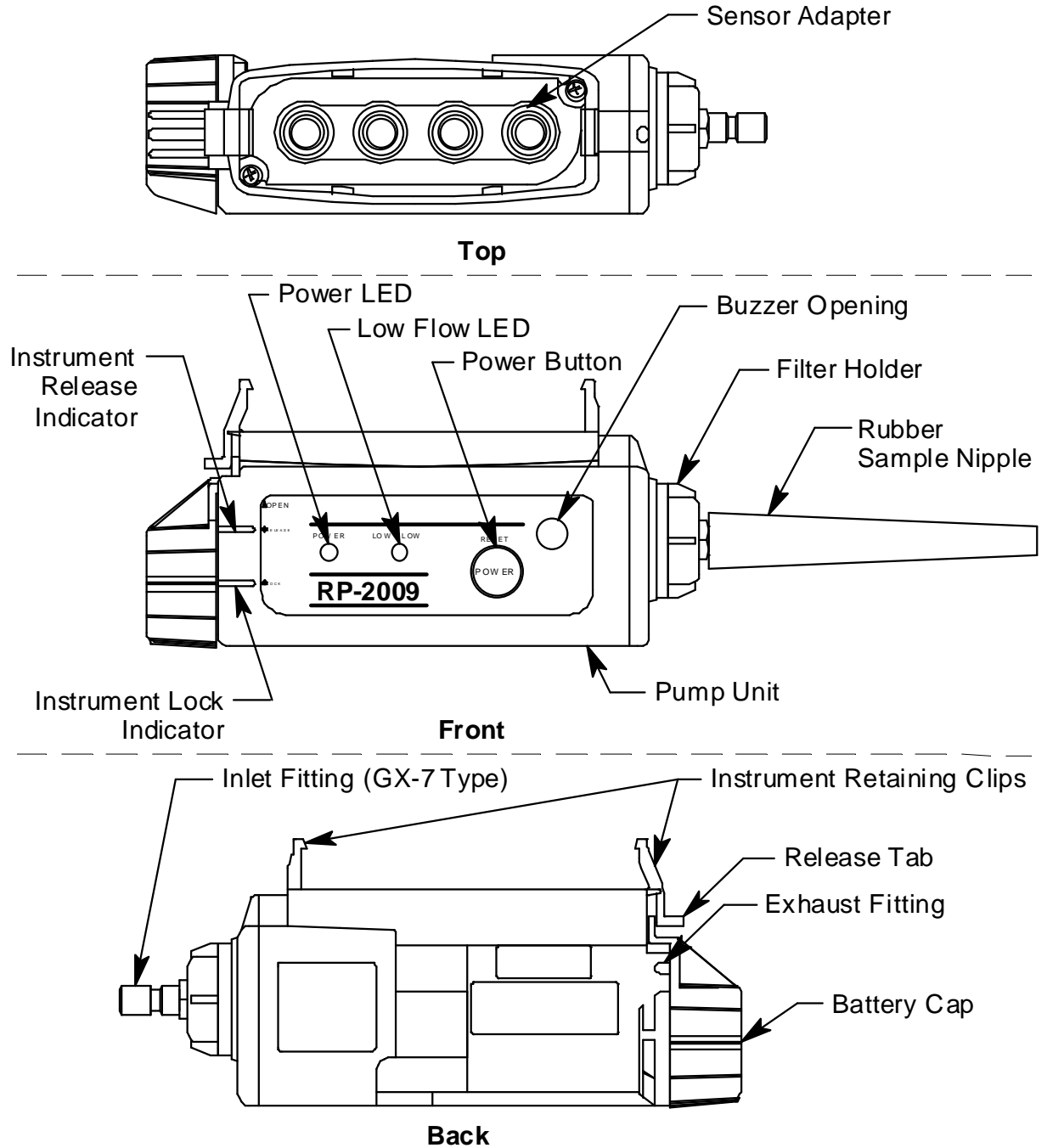
**Table 1: Specifications**

Power Supply	1 ea. AA size alkaline
Operating Time	8 hours minimum at 25°C
Operating Temperature & Humidity	-20°C to +50°C, 0 - 85% Relative Humidity (non-condensing)
Dimensions	33 (D) x 57 (W) x 142 (H) mm, tapered nozzle not included
Weight	Approximately 123 g (including alkaline battery)
Sample Flow Rate	0.5 LPM (liters per minute)
Alarm Indications	Low Flow & Low Battery
Safety/Regulatory (when used with the GX-2009)	ATEX/IECEX Exia II CT4

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## Description

The RP-2009 pump is a sample drawing accessory for the GX-2009 Gas Monitor. It consists of the pump unit and the rubber sample nipple.



**Figure 1: RP-2009 Pump Component Location**

## **Pump Unit**

The pump unit is housed in a red plastic case. A GX-7 type male quick connect fitting is located on one end of the pump unit. This is the inlet fitting to the pump unit. The GX-7 quick connect is installed in a removable clear plastic filter holder. A cotton dust filter is inside the filter holder. The filter holder may be removed by turning it counterclockwise and pulling it away from the pump unit. Two flat membrane disk hydrophobic filters and a wire mesh disk are located in the pump unit on the filter holder end.

The battery compartment is located on the other end of the pump unit. One AA alkaline battery is installed in the battery compartment and held in place by a black plastic battery cap. The battery cap may be removed for access to the battery by pushing it down, turning it 1/4 turn counterclockwise, and pulling it away from the pump unit.

The exhaust fitting is located under the battery cap tab.

A POWER button, a buzzer opening, a power indication LED, and a low flow LED are located along the middle front of the pump unit. The POWER button turns the pump unit on and off. The buzzer opening allows the buzzer's sound to emanate from the buzzer. The power LED is on when the pump unit is on. The low flow LED flashes when the pump is experiencing a low flow condition.

An instrument release indicator and an instrument lock indicator are located on the front left of the pump unit. The indicator tab on the battery cap indicates the current position of the battery cap.

Inside the pump unit case are the circuit board and diaphragm pump. There are no user serviceable components inside the pump unit case except for the battery accessible through the battery cap and the wire mesh and hydrophobic disk filters accessible through the filter holder.

The pump unit is configured to mate with the sensor face of the GX-2009. Retaining tabs on the top of the RP-2009 snap onto the sensor face of the GX-2009. The GX-2009 must be installed so the front of the instrument is facing the front of the RP-2009. When installed, the RP-2009 seals to the GX-2009's sensor face with a gasket.

## **Rubber Sample Nipple**

A cone shaped 4 inch long rubber sample nipple is included with the RP-2009 and is normally installed on the inlet fitting by pushing the larger end over it. The smaller end can be inserted in a hole or some other access to an enclosed area to sample the environment.

## Optional Hose & Probe

When desired, the rubber sample nipple may be removed and a sample hose and probe with GX-7 fittings (optional accessories) may be connected to the inlet fitting. Sample hose lengths are available from 10 feet to 30 feet (see Parts List at the end of the manual).

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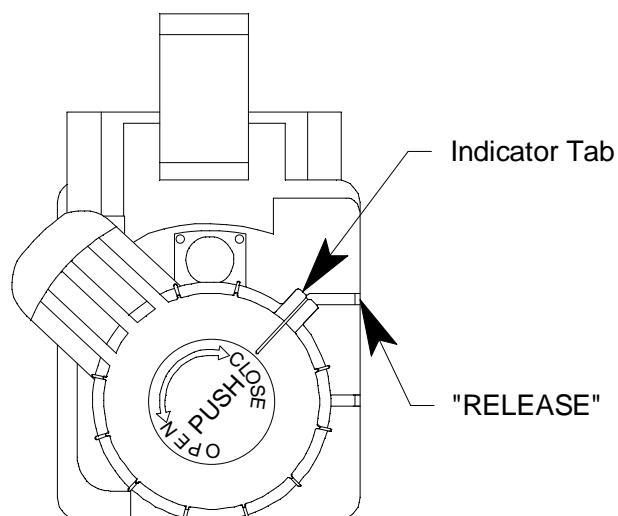
**CAUTION:** *Sample hose lengths of more than 30 feet are not recommended for the RP-2009 because of flow rate reduction.*

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## Normal Operation

1. Start up the GX-2009 and enter normal operation as described in the GX-2009 Operator's Manual.
2. Push down on the RP-2009's battery cap and rotate it 1/8 turn counterclockwise so that the indicator tab on the battery cap is next to "RELEASE".



**Figure 2: Releasing the Battery Cap**

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**WARNING:** *Do not install the GX-2009 onto the RP-2009 without rotating the battery cap to "RELEASE". Installing the GX-2009 onto the RP-2009 with the battery cap in the "LOCK" position may result in damage to the RP-2009.*

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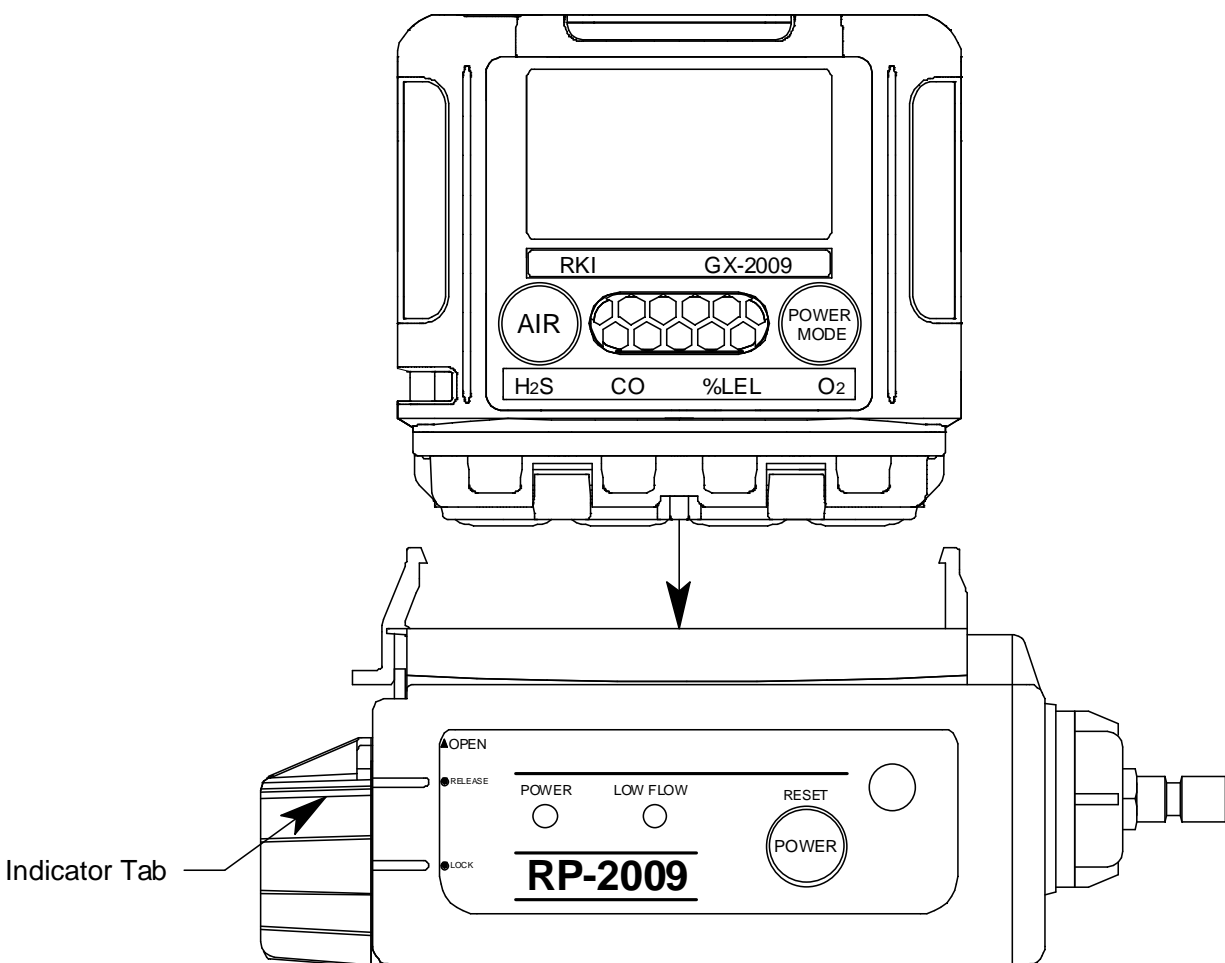
3. Be sure the front labels on the GX-2009 are facing the same way as the front labels on the RP-2009. The retaining tabs on the RP-2009 are keyed to allow installation of the GX-2009 only if the labels on both instruments are facing front. Do not force the GX-2009 into the RP-2009 if both labels are not facing front.

4. Push the GX-2009 sensor face onto the RP-2009's top face until the GX-2009 is seated in the RP-2009 and the retaining clips are fully engaged with the GX-2009. Be sure that the RP-2009 is fully engaged on the instrument. When fully engaged, the GX-2009 should not move around at all.

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**CAUTION:** *If the RP-2009 is not fully engaged, the unit will not respond to the target gases properly.*

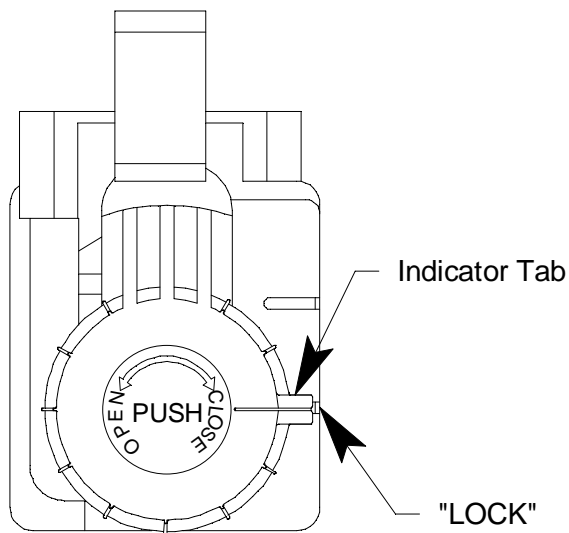
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**Figure 3: Connecting the RP-2009 to the GX-2009**

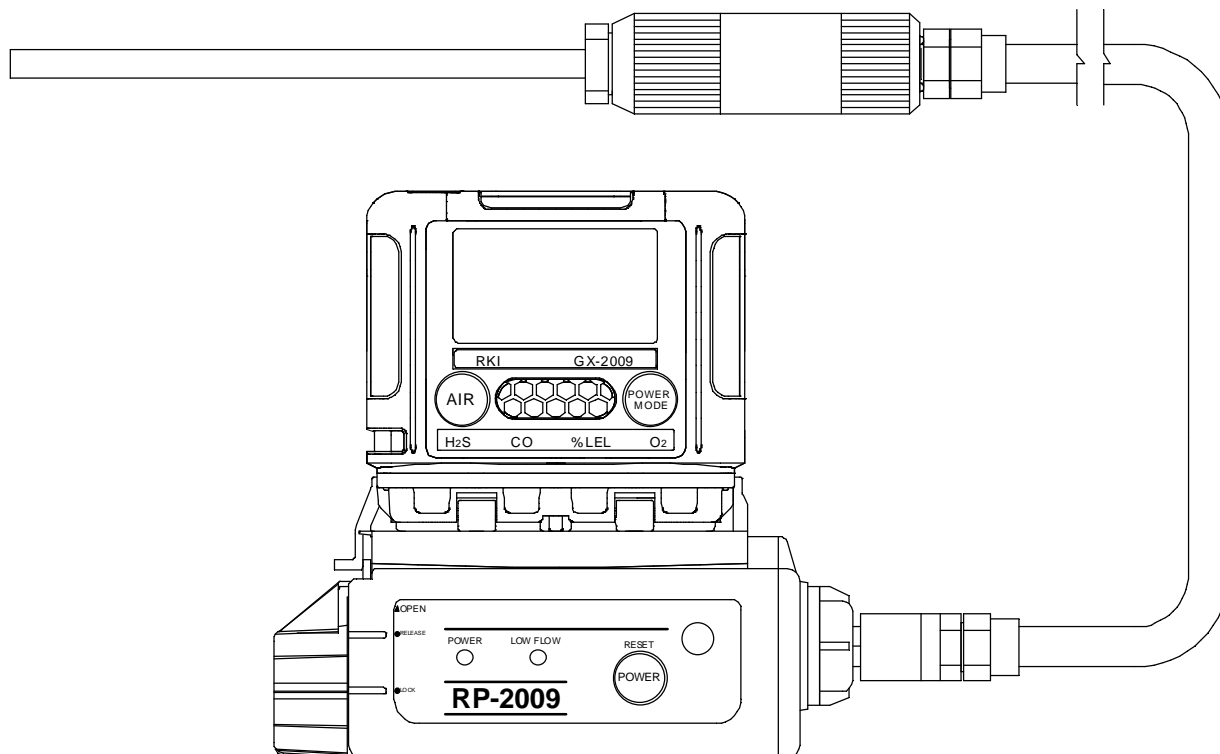


- Secure the GX-2009 in the RP-2009 by pushing down on the battery cap and rotating it an 1/8 turn clockwise so that the indicator tab on the battery cap is next to "LOCK".



**Figure 4: Locking the Battery Cap**

- Attach the rubber sample nipple or an optional hose and probe to the inlet fitting.



**Figure 5: Connecting the Optional Hose & Probe**

- Attach the RP-2009/GX-2009 assembly to your belt or clothing using the belt clip on the GX-2009.

8. Turn on the pump unit by pressing and holding the POWER button until the RP-2009 beeps and the power indication LED turns green, about 2 seconds.

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***WARNING: While the GX-2009 is installed in the RP-2009, the pump must be on for the GX-2009 to function as a gas detection monitor.***

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9. Go to the area to be sampled.

If the rubber sample nipple is used, detach the RP-2009/GX-2009 assembly from your belt and hold the RP-2009/GX-2009 assembly near the area to be sampled. If sampling from a vessel or an enclosed area is desired, insert the rubber sample nipple into the vessel or enclosed area. Allow the pump unit to sample for 90 seconds for a full response on the GX-2009.

If an optional hose and probe are used instead of the rubber sample nipple, hold the probe in the area to be sampled. To sample from a well or other similar sample area, the hose and probe may be lowered into the sample area. Allow the pump unit to sample for 90 seconds for a full response on the GX-2009.

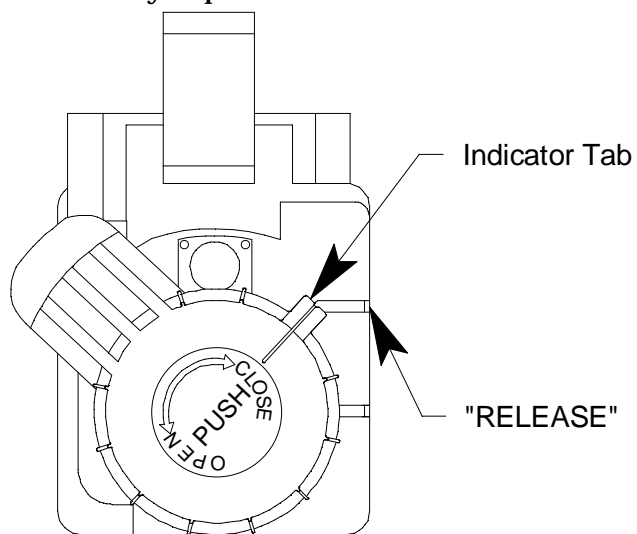
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**NOTE:** Although the RP-2009 pump does have a hydrophobic filter built in, the optional probe does not have a hydrophobic filter. It has a dust filter only.

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10. Monitor the GX-2009 display for the gas readings and take appropriate action if gas alarms occur.
11. When sampling is complete, go to a fresh air area and turn off the pump unit.
12. Remove the RP-2009/GX-2009 assembly from your belt or clothing.
13. Turn off the RP-2009 by pressing and holding the POWER button until the RP-2009 sounds a long beep and the power indicator LED turns off, about 3 seconds.
14. Turn off the GX-2009.

15. To remove the GX-2009 from the RP-2009, push down on the battery cap and rotate it an 1/8 turn counterclockwise so that the indicator tab on the battery cap is next to “RELEASE”.



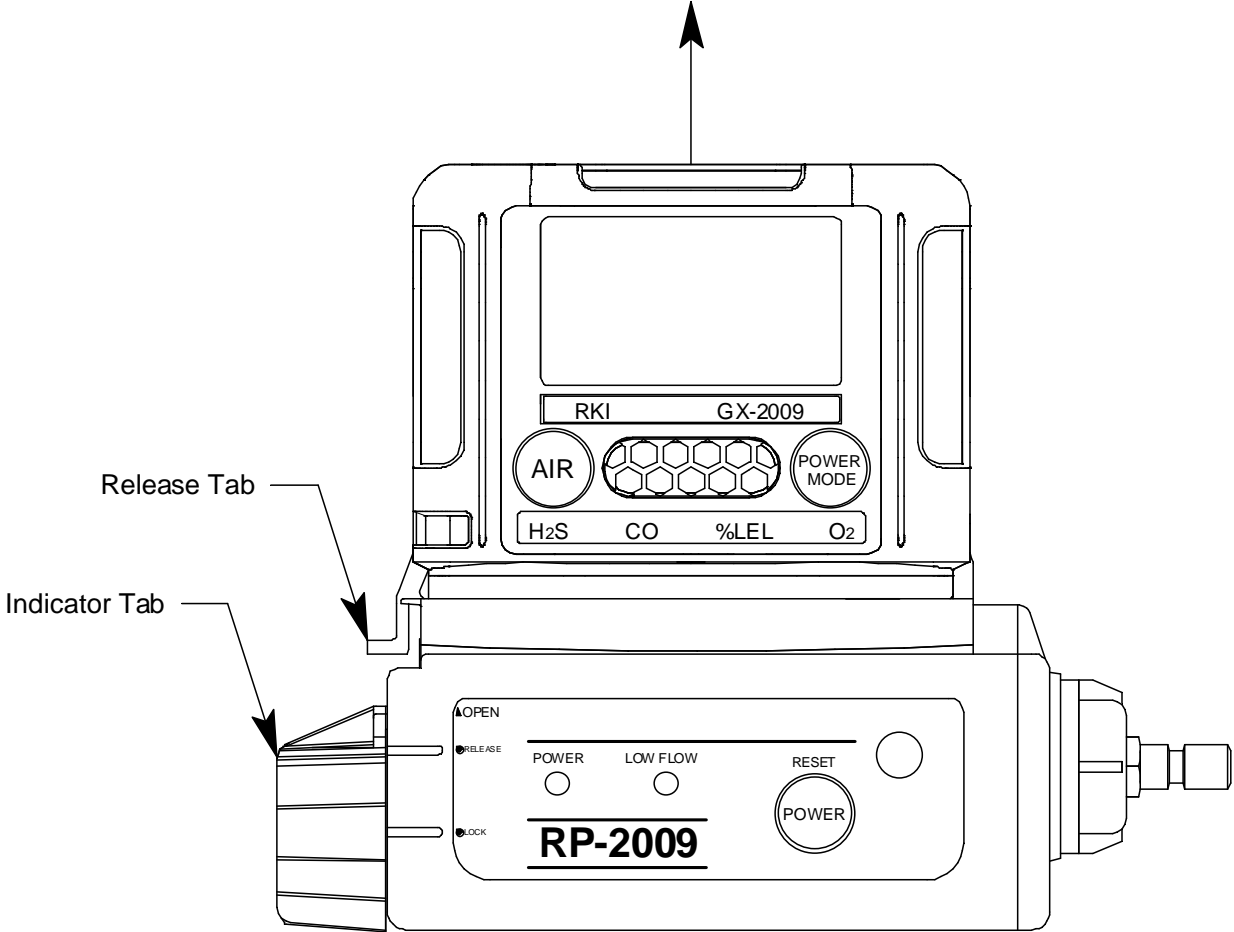
**Figure 6: Releasing the Battery Cap**

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***WARNING: Do not remove the GX-2009 from the RP-2009 without rotating the battery cap to “RELEASE”. Removing the GX-2009 from the RP-2009 with the battery cap in the “LOCK” position may result in damage to the RP-2009.***

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16. Press the bottom of the release tab toward the pump unit and pull up on the GX-2009.



**Figure 7: GX-2009 Removal**

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## Alarms

The table below outlines the alarms that may occur on the RP-2009.

Alarm Type	Visual Indications	Audible Indications	Other Indications	Recommended Action
<b>Low Battery</b>	POWER LED flashing	none	none	Replace the battery.
<b>Dead Battery</b>	POWER LED flashing	constant buzzer	none	Replace the battery.
<b>Low Flow</b> <i>NOTE: A low flow alarm may get combined with a low or dead battery alarm since a low battery voltage may cause the pump to stop working.</i>	LOW FLOW LED flashing	intermittent buzzer	pump stops	<ul style="list-style-type: none"><li>• Check the rubber sample nipple and filters to make sure they are clear.</li><li>• If a hose and probe are used, check them for kinks or obstructions.</li><li>• Press and release the POWER button to reset the alarm.</li><li>• If the low flow condition persists, the pump may need servicing.</li></ul>

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## Maintenance

### Replacing The Battery

1. Locate the black plastic battery cap on one end of the pump unit.
2. Push down and rotate battery cap counterclockwise until it stops, 1/4 of a turn.
3. Pull the battery cap away from the pump unit.
4. Remove the old battery from the pump unit. It will slide right out.
5. Insert the new battery + end first into the pump unit. Use an AA alkaline. The battery orientation is shown on the bottom of the pump unit.
6. Slide the battery cap over the battery onto the pump unit, push it down and turn it clockwise until it stops beneath the instrument release tab.

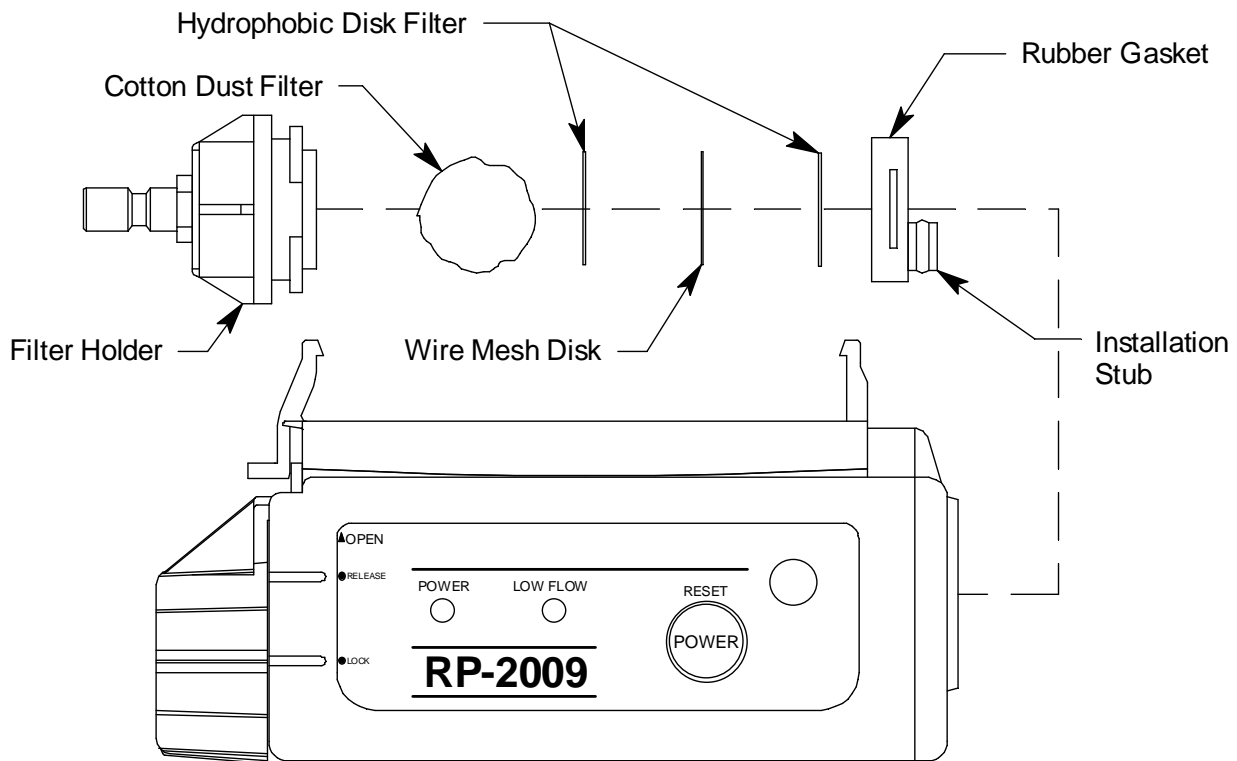
### Replacing the Cotton Dust Filter

1. Locate the clear plastic filter holder at one end of the pump unit.
2. Grasp the ridged sides of the filter holder and turn it 1/4 of a turn counterclockwise.

3. Pull the filter holder away from the pump unit.
4. Remove the old cotton dust filter from the filter holder and replace it with a new cotton dust filter.
5. Reinstall the filter holder. Align the two tabs on the bottom of the filter holder with the two slots in the pump unit. Push the filter holder into the pump unit and turn it 1/4 turn clockwise until it snaps into place.

### Replacing the Hydrophobic Disk Filter and Wire Mesh Disk

1. Locate the clear plastic filter holder at one end of the pump unit.
2. Grasp the ridged sides of the filter holder and turn it 1/4 of a turn counterclockwise.
3. Pull the filter holder away from the pump unit. Do not lose the cotton dust filter.
4. The hydrophobic disk filters and wire mesh disk are located in the pump unit and are retained by a rubber gasket. Pull out the rubber gasket with needle nose pliers.



**Figure 8: Changing the Hydrophobic & Wire Mesh Filters**

5. Remove the old hydrophobic filters and/or wire mesh disk from the gasket. A hydrophobic filter is located on either side of the wire mesh disk.

6. Install the new hydrophobic filters and/or wire mesh disk making sure a hydrophobic filter is located on each side of the wire mesh disk.
7. Reinstall the gasket with the parts into the pump unit.
8. Reinstall the filter holder with the cotton dust filter. Align the two tabs on the bottom of the filter holder with the two slots in the pump unit. Push the filter holder into the pump unit and turn it 1/4 turn clockwise until it snaps into place.

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## Parts List

Table 2 lists replacement parts and accessories for the RP-2009 pump.

**Table 2: Parts List**

<b>Part Number</b>	<b>Description</b>
07-2005RK	Gasket, filter/screen retaining
07-6027RK	O-ring, for battery compartment
17-1001RK	Tapered rubber nozzle
21-1833RK	Filter holder, clear plastic
21-1895RK	Battery cap
33-0159RK	Hydrophobic disk filter
33-1031RK	Cotton ball 25 pack, for replacement of cotton dust filter
33-1112RK	Wire mesh disk filter
49-1120RK	AA alkaline battery
80-0009RK-XX	Sample hose (optional). Replace "XX" with length in feet. Available lengths for the RP-2009 are 10, 15, 20, 25, & 30 feet.
80-0150RK	Sample probe with dust filter (optional)