

BadgeRAE

PGM-1010 CO Detector
PGM-1020 H₂S Detector



User Manual

045-4001-000, Revision D, March 2005



READ BEFORE OPERATING



This manual must be carefully read by all individuals who have or will have the responsibility for using or testing this product. The product will perform as designed only if it is used and tested in accordance with the manufacturer's instructions.

US & Canadian Intrinsic Safety:

UL/cUL Class I, Groups A, B, C, D T5

European Intrinsic Safety:

CE 0575 Ex II 1 G EEx ia IIB T5 / 2 G EEx ia IIC T5

DEMKO 02 ATEX 0233306X

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WARNING! Read this manual for Intrinsic Safety Precautions. Substitution of components may impair intrinsic safety.

WARNING! If the LCD displays "Test" do not use instrument until a successful bump test has been performed and the LCD displays "OK".

DO

- Perform a calibration bump test every 30 days.
- Make sure the gas inlet is free of dirt and debris.
- Properly recycle Lithium batteries when disposing.

DO NOT

- Take the instrument apart to replace or fix any parts except the battery.
- Use the instrument after its expiration date.
- Use the gas monitor as a measurement device.



CAUTION!!

Change battery only in an area known to be non-hazardous.

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General Information

The BadgeRAE is a portable clip-on gas monitor that is operated by a single key and has a two-year life span (typical). It can produce a maximum of 730 minutes of alarm (equivalent to one minute of alarm per eight hours for over two years).

The BadgeRAE is designed to be clipped to a hardhat, belt or other clothing, for personal monitoring. Gas levels are monitored at low and high set points, indicated by two different types of alarm signals: audio and light. The BadgeRAE requires no calibration, however, a bump test should be performed every 30 days.



Equipment List

1. BadgeRAE Detector with H₂S (PGM-1020) or CO (PGM-1010) sensor as specified
2. Lithium Battery - installed
3. Spare Lithium battery
4. Alligator Clip - attached
5. Wrist Strap - included
6. Gas Test Adapter - included
7. Operation Instructions - included

See the figure below for a picture of the standard box contents.



Accessories

- BadgeRAE Test Station for automated bump testing
- Bump Test gases (cylinders and regulators)
- Rubber boot



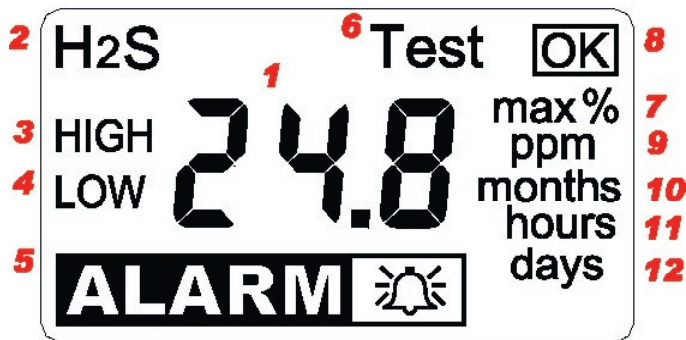
Physical Description

1. LED Alarm
2. Display
3. Audio Alarm
4. Gas Inlet
5. Button
6. Alligator Clip
7. Battery compartment



DisplayFeatures

- 1, Remaining operational life, peak readings, alarm-minutes (divided by 10) used.
- 2, Type of detector
- 3, High Alarm
- 4, Low Alarm
- 5, Alarm Condition
- 6, Bump Test needed indicator
- 7, Peak Value
- 8, Function Status
- 9, Parts Per Million (unit of measure)
- 10, Remaining Time in Months
- 11, Remaining Time in Hours
- 12, Remaining Time in Days



Start-up

Before the monitor is used for the first time, it is in standby and the display is blank. To turn on the BadgeRAE:

1. Press and hold the button for five seconds. After a long beep, the monitor performs a 30-second warmup.

After the warm-up, the monitor is in normal mode and the remaining typical life span of the battery is displayed.


Operation

During normal operation, the BadgeRAE displays the typical remaining operating life in months; no concentration is displayed.

Operational life is limited to 730 minutes of alarm. The number of alarm-minutes consumed can be viewed by pressing the button (see “Alarm Minutes Consumed” on page 7).

OK An “OK” is displayed if the unit has passed calibration bump test within the last 30 days.

Test A “Test” is displayed when the 30-day period has expired and a calibration bump test is required, or the last calibration failed.

 **Warning:** The BadgeRAE is sealed with a special screw and is designed to remain on continuously once activated. All warranties are null and void if the BadgeRAE is opened. Only the battery compartment can be opened.

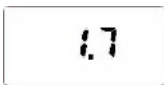
Alarms and Maxium Alarm Minutes

The BadgeRAE is designed to deliver two years of operation with one munute of alarm per eight hour shift or about 730 alarm-minutes.

During alarm conditions, the current alarm set point will appear on the LCD. See Alarm Set Points for more details.

Alarm Set Points, Peak Readings and Alarm-Minutes Consumed

1. Press the button and the display will test all segments. The LED will light up, and the monitor will beep.
2. It will automatically display the high alarm limit, low alarm limit, firmware version (“ur” = version), the alarm-minutes consumed, and then return to normal mode.



3. If an alarm occurred within the past 24 hours, the peak value and the elapsed time since the alarm occurred will appear.



NOTE: Custom alarms can be as low as 5 ppm for H₂S and 20 ppm for CO and are set at time of order. BadgeRAE's with custom alarms have a special label on their back to indicate alarm levels.

Changing the battery

⚠ CAUTION!!

Change battery only in an area known to be non-hazardous.

To ensure the 2-year life of the detector, the BadgeRAE comes with a spare battery.

To change the battery:

Step 1. Remove the battery compartment cover on the back of the detector.



Step 1



Step 1



Step 2

Step 2. Lift the ribbon out.

⚠ Warning!!

Use only the following models of batteries:

Tadiran TL 5955

EVE ER14335




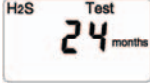



Step 3. Using the ribbon, pull the battery out.





Step 4. Replace the old battery using the orientation markers inside the battery compartment.



Alarm Signals

LCD	Reason	LED	Beeps	Vibration
	Normal Mode	None	None	None
	Low Alarm	Red LED every 2 seconds	1 beep every 2 seconds	Every 2 seconds
	High Alarm	Red LED every 2 seconds	3 beeps every 2 seconds	Every 2 seconds
	Bump test required every 30 days	None	None	None
	Bump test failed	Red LED once every hour	1 beep every hour	None
	Seven days of life span remain	Red LED every minute	1 beep every minute	None
	Alarm-minutes used, divided by 10	None	None	None

	<p>The instrument continues to operate for 8 hours after its life span. Press button for 5 seconds to turn instrument off.</p>	<p>Constant red</p>	<p>1 beep every minute</p>	<p>None</p>
	<p>Battery is depleted</p>			<p>Change battery</p>

Calibration Bump Test

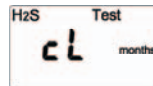
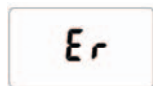
1. To start the bump test, press and hold the button for 5 seconds until the display toggles back and forth between "bp" (bump) and "go".




2. Press the button again for 5 seconds until only "bp" is displayed.
3. Attach the gas adapter to the gas inlet on the monitor.
4. Apply test gas to the monitor. (H_2S -25 ppm, CO - 50 ppm)
5. If the monitor passes the bump test, the confirmation message "PA" is displayed and the LED will be green.



6. If the monitor fails the bump test, or the monitor does not "see" any gas within 100 seconds, the error message "Er" (error) is displayed. The LED will be red and a long beep will sound. To clear the alarm, press the button for 5 seconds. The monitor will display "cL" (clear) for 3 seconds and then display the remaining operating life and the TEST warning.



Specifications

<i>Size</i>	3.6 in x 2.0 in x 0.9 in (92 mm x 50 mm x 22 mm)
<i>Weight (inc. clip)</i>	2.9 ounces (82 grams)
<i>Gas Concentration</i>	CO, 1 - 300 ppm
<i>Range</i>	H ₂ S, 1 - 100 ppm
<i>Life Span</i>	2 years or 730 alarm-minutes, maintenance-free
<i>Alarm Set Points</i>	CO Low: 35 ppm, High: 200 ppm H ₂ S Low: 10 ppm, High: 15 ppm
<i>Sensor Type</i>	Electrochemical
<i>Response Time</i>	Less than 60 sec when exposed to 50 ppm CO or 25 ppm H ₂ S
<i>Operation</i>	Single Key
<i>Alarm Signals</i>	Audio alarm - 90dB at 10 cm Visual alarm - red/green LEDs
<i>Certifications</i>	US & Canadian Intrinsic Safety: UL/cUL Class I, Groups A, B, C, D, T5 European Intrinsic Safety: CE 0575  II 1 G EEx ia IIB T5 / 2 G EEx ia IIC T5 DEMKO 02 ATEX 0233306X

Specifications continued on next page

Specifications

Continued from page 13

Operation Continuous operation:

Temperature -20° C to 45° C (-4° F to 113° F)

Intermittent operation:

-40° C to 55° C (-40° F to 131° F)

Operation Humidity 0% to 95% humidity,
non-condensing

Resistance Radio EMC standard 89/336/EEC
Interference

Package Water-resistant, shock-resistant

Contact Information

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SPECIAL NOTE: Before returning the unit for service or repair, please obtain a Return Material Authorization (RMA) Number for proper tracking of your equipment. Packages without RMA Numbers will be refused at the factory.

