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C-A OPERATIONS PROCEDURES MANUAL

8.36.2 Calibration of the RKI Instruments GasWatch 2 Personal Oxygen Monitor

Text Pages 2 through 4

Attachments

Hand Processed Changes

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Approved: _____ *Signature on File* _____
Collider-Accelerator Department Chairman Date

A. Etkin

8.36.2 Calibration of the RKI Instruments GasWatch 2 Personal Oxygen Monitor

1. Purpose

- 1.1. This procedure details the process to be used to calibrate the RKI Instruments Model GasWatch 2 Personal Oxygen Monitor.

2. Responsibilities

- 2.1. The C-A Gas Monitor Calibrator shall set the zero of the span annually the RKI Instruments Model GasWatch 2 Personal Oxygen Monitor. In addition the check of helium sensitivity shall be performed.
- 2.2. The C-A Gas Monitor Calibrator shall record all data on the RKI Instruments Model GasWatch 2 Personal Oxygen Monitor Calibration Record Sheet [[C-A-OPM-ATT 8.36.2.a](#)], record data in the calibration database, and attach updated calibration label.

3. Prerequisites

- 3.1. Oxygen Monitor Zero Kit containing:
 - 3.1.1. Cylinder of Nitrogen or Helium gas (>99.99% pure).
 - 3.1.2. Regulator with flow meter set to a rate of 0.5 LPM for cylinder in 3.1.1
 - 3.1.3. Calibration adapter for the model GasWatch 2
 - 3.1.4. Non-adsorbent tubing
- 3.2. Helium Sensitivity Check Kit containing:
 - 3.2.1. Cylinder of 10% He balance air mixture (analyzed to 2%)
 - 3.2.2. Fixed Flow Regulator with flow rate of 0.5 LPM for cylinder in 3.2.1

4. Precautions

- 4.1. This procedure shall performed in a ventilated location with an exhaust to the outside.

5. Procedures

- 5.1. Normalize sensor readings to fresh air by
 - 5.1.1. In a fresh air environment turn on the GasWatch2 by pressing and holding the POWER/MODE button, fig. 1, for one second.
 - 5.1.2. Press and hold the AIR button for approximately three seconds to allow the monitor to set the span for the Oxygen readings [20.9%].
- 5.2. Assemble the calibration kit for the GasWatch2 by
 - 5.2.1. Snap the adapter plate over the sensor area, fig 2.
 - 5.2.2. Attach the tubing to the Calibration adapter.
 - 5.2.3. Attach the regulator to the cylinder of Nitrogen or Helium gas.
 - 5.2.4. Attach the tubing to the regulator output.

- 5.3. To set the span reading [zero Oxygen reading]
 - 5.3.1. Normalize sensor readings as per 5.1.
 - 5.3.2. Assemble the calibration kit as per 5.2.
 - 5.3.3. With the GasWatch2 off, press and hold the AIR button, then press and hold the POWER/MODE button.
 - 5.3.4. Release both buttons when you hear a "beep".
 - 5.3.5. The calibration value will be displayed use the AIR button as necessary to adjust the value to 0.0.
 - 5.3.6. Press the POWER/MODE button to accept the calibration value and proceed to the calibration screen.
 - 5.3.7. Flow gas for ~ 2 min.
 - 5.3.8. Press the POWER/MODE button
 - 5.3.9. When the GasWatch2 begins the startup process the calibration is completed, the gas flow can be shut off and the adapter removed.

- 5.4. To perform the check of helium sensitivity
 - 5.4.1. Normalize sensor readings as per 5.1.
 - 5.4.2. Assemble the calibration kit as per 5.2 except use the 10% Helium in air mixture [18.8% Oxygen] cylinder instead of the calibration gas cylinder.
 - 5.4.3. Flow gas for ~ 2 min.
 - 5.4.4. Record the Oxygen reading on the calibration record sheet.

- 5.5. To verify proper settings of the alarms
 - 5.5.1. With the GasWatch2 off, press and hold the AIR button, then press and hold the POWER/MODE button.
 - 5.5.2. As soon as the display appears release the AIR button.
 - 5.5.3. When the unit beeps release the POWER/MODE button
 - 5.5.4. The low alarm setting is displayed and should be 19.5%.
 - 5.5.5. Press the Power/Mode button to display the high alarm, which should be 23.5%.
 - 5.5.6. The AIR button can be used to raise the setting. This control wraps around.
 - 5.5.7. Press the POWER/MODE button after verifying the high alarm setting and the GasWatch2 will start its startup sequence.
 - 5.5.8. Record the verification on the calibration record sheet.

- 5.6. Verify that in fresh air the Oxygen reading is $20.9\% \pm 0.1\%$.

- 5.7. Upon successful completion of this procedure, attach a new calibration label and record appropriate data in the calibration database. Calibration labels are available through BNL Stock, Stock Number S-33844, or equivalent.
 - 5.7.1 Upon failure of any steps within this procedure, document failure on record sheet, repair gas monitor as per manufacturers instruction, and re-perform calibration procedure.

6. Documentation

6.1. Calibration database records shall be maintained for a minimum of three (3) years.

7. References

7.1. RKI Instruments GasWatch2 Operator's Manual

7.2. [C-A-OPM 13.8.2 "Calibration"](#).

8. Attachments

8.1 [C-A-OPM-ATT 8.36.2.a "RKI Instruments GasWatch 2 Personal Oxygen Monitor Calibration Record Sheet"](#)

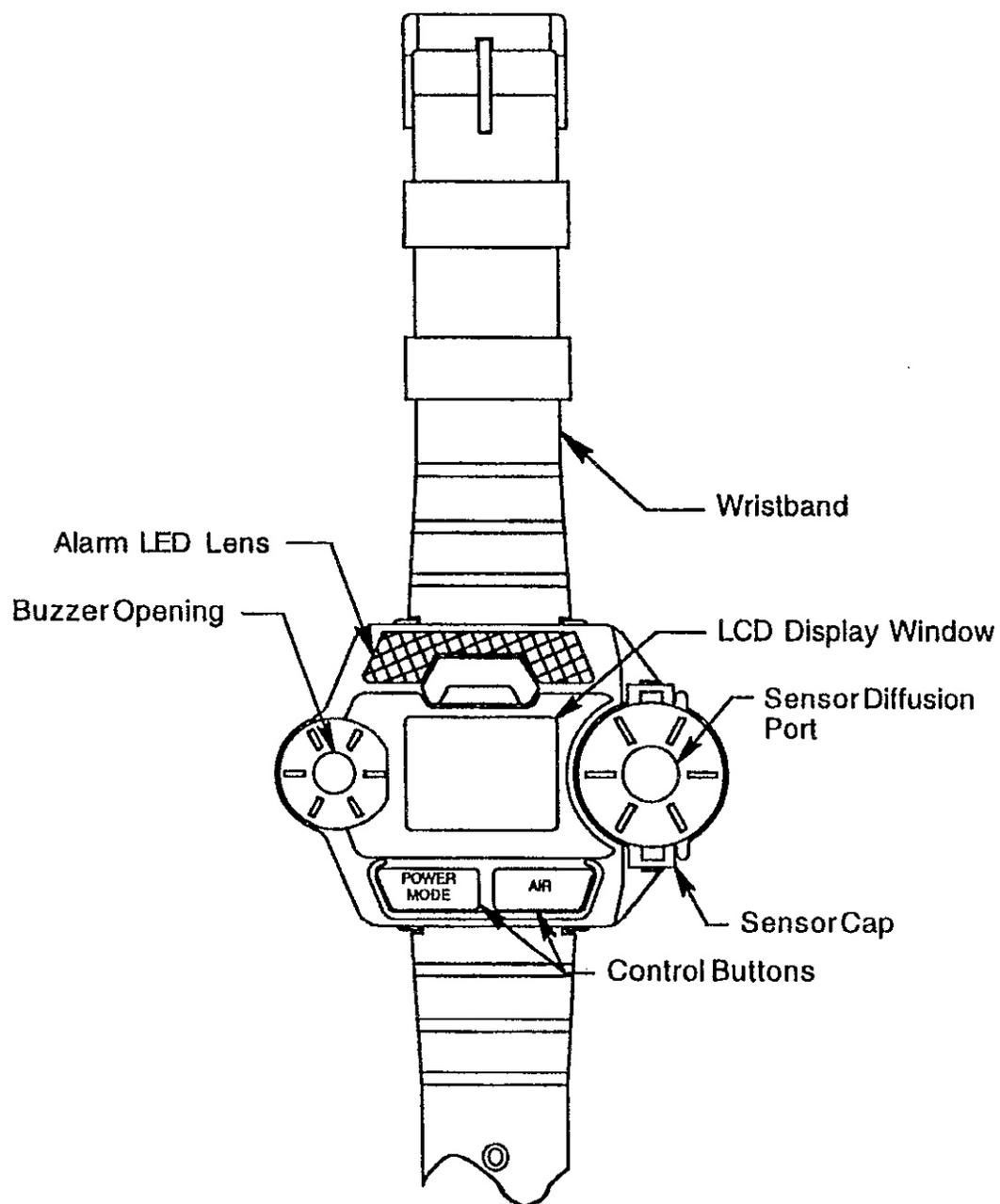


Figure 1: Components of the GasWatch 2