

SENSIT[®] HCN

HYDROGEN CYANIDE GAS ANALYZER

INSTRUCTION MANUAL

Read and understand instructions before use.

For Models SENSIT HCN
and SENSIT HCN CO

WARNING: To prevent ignition of flammable
or combustible atmospheres, disconnect power before servicing.



SENSIT 851 Transport Drive • Valparaiso, IN 46383 (USA)
Phone: 219.465.2700 • www.gasleaksensors.com

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FOR YOUR SAFETY

NOTICE:  **CAUTION:** This safety symbol is used to indicate a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

 **WARNING:** To prevent the risk of ignition of flammable atmospheres, batteries must only be changed in an area known to be non-hazardous.

 **WARNING:** To prevent ignition of flammable or combustible atmospheres, disconnect power before servicing.

Do not mix batteries of different age or type.

HYDROGEN CYANIDE EXPOSURE STANDARDS AND HEALTH EFFECT CHART


Hydrogen Cyanide can cause rapid death due to metabolic asphyxiation.


LEVEL	EFFECT
4.7ppm	NIOSH recommended exposure limit (REL)
10ppm	OSHA permissible exposure limit (PEL)
135ppm	Death after 30 minutes exposure
181ppm	Death after 10 minutes exposure
270ppm	Death after 6-8 minutes exposure
3,404ppm	Death after 1 minute exposure

ppm = parts per million Recent study estimations (Hathaway et al. 1991)

5.6% HCN lower flammable limits in air (percent by volume)
40.0% upper flammable limits in air (percent by volume)

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PARTS AND ACCESSORIES

STANDARD ACCESSORIES (INCLUDED)

872-00001	Hard Carrying Case
883-00023	Hot Air Probe (Flue Gase)
873-00005	Dirt and Water/Particle Filter
750-00015	Instruction Manual
310-00004	3"C" Alkaline Batteries
873-00017	External Hydophobic Filter Assembly

OPTIONAL ACCESSORIES AND STANDARD REPLACEMENT PARTS

873-00008	Replacement Dirt and Water Filter Assembly
870-00004	IR Printer
870-00039	IR Link Interface w/ SmartLink Software
914-00000-01	Smart-Cal Automatic Calibration Station

CALIBRATION KITS

Contact us with instrument model number for correct Calibration Kit.

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GENERAL DESCRIPTION

The **SENSIT® HCN** is an advanced state-of-the-art Hydrogen Cyanide (HCN) gas analyzer designed to provide part per million readings from 0-100ppm.

The **SENSIT® HCN** is capable of performing ambient as well as hot or smoldering air samples with its hot air probe and powerful rotary vane pump.

The **SENSIT® HCN** is equipped with an advanced long life electrochemical sensor that can be field calibrated and has a low replacement cost. A renewable filter eliminates cross sensitivity to many gases.

The **SENSIT® HCN** may also be used as a personal monitor. There is an alarm at 5ppm. The display must be in view to determine gas concentrations.

The **SENSIT® HCN** may be equipped with an optional carbon monoxide sensor (CO) to simultaneously monitor from 0-2000ppm CO

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SPECIFICATIONS

PRODUCT SPECIFICATIONS

Power Supply:	3 "C" Alkaline Batteries
Sensor:	Long Life Electrochemical
Range:	0-100ppm HCN 0-2000ppm CO*
Alarm:	Preset 5 ppm HCN Preset 50 ppm CO*
Alarm	Range: 1-10 ppm HCN 1-300 ppm CO*
Warm Up:	Approx. 1 Minute
Response Time:	90% of reading < 60 sec.
Duty Cycle:	60 Minutes
Battery Life:	Approx. 30 Hours
Size:	3.5" x 12" x 1.6" (89 x 305 x 40 mm)
Weight:	1.1 lbs. (500 g)
Probe Length:	9 Inches
Tube Length:	5 Feet
Hot Air Probe:	700° F (371.11 celsius) @ 5 Minutes

*Optional



Approved UL913, For Class 1, Division 1, Groups C & D hazardous locations when used with alkaline or NiMH batteries.

WARNING: To prevent ignition of flammable or combustible atmospheres, disconnect power before servicing.

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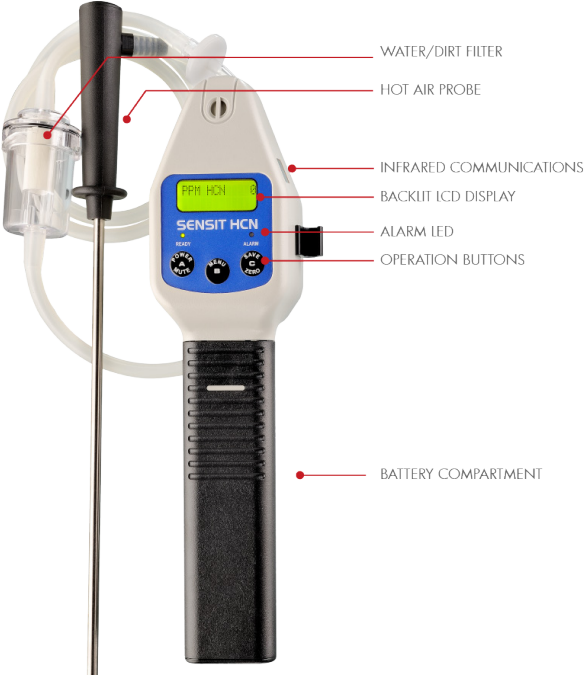
*Optional



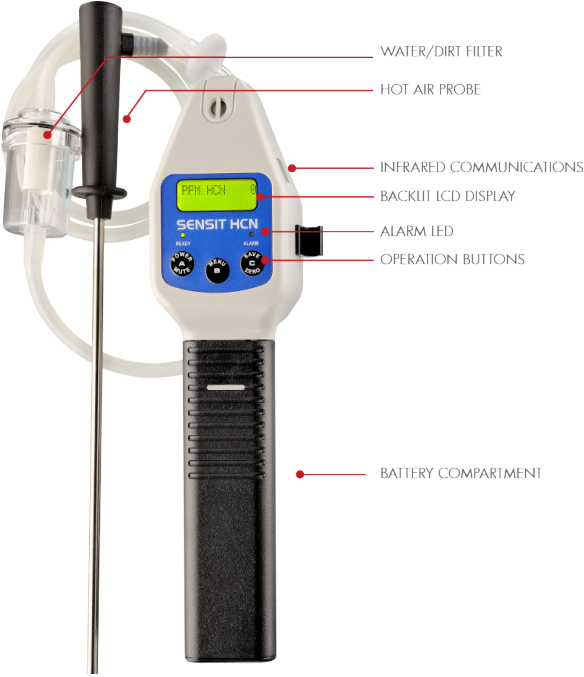
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PRODUCT FEATURES



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SENSIT® HCN instrument is constructed of high impact ABS plastic to withstand the rigors of field use. Incorporated in the hand grip area is the battery compartment. **SENSIT® HCN** requires 3 "C" type alkaline batteries. Duracell MN 1400BK provide approximately 30 hours of use.

The alarm can be easily heard with the speaker located in the back of the instrument.

An infrared Port is located on the right side to allow the **SENSIT® HCN** instrument to download calibration data and readings the operator has elected to save to the instrument's on-board memory.

A two line display continually updates gas concentrations and internal functions such as air flow block and battery power. LEDs below the display indicate READY or ALARM conditions.

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PRODUCT FEATURES

There are 3 operational button pads on the front of the SENSIT® HCN instrument.

BUTTON **[A]** POWER/MUTE
operates power and mute features.

BUTTON **[B]** MENU
Operates a user menu to calibrate, download and set the clock.

BUTTON **[C]** SAVE/ZERO
Activates the save feature and performs a manual zeroing of the sensors.

Pressing any button will produce a click sound.

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Activates the save feature and performs a manual zeroing of the sensors.

Pressing any button will produce a click sound.

BATTERY INSTALLATION/REPLACEMENT

Battery replacement is necessary when the display reads BAT LOW, an audible alarm sounds and the green ready LED flashes. When BAT LOW is displayed, the instrument has approximately 30 minutes of useful operation time prior to shut off.

 **CAUTION:** Always change batteries in an environment free of combustible gases.

Remove the battery sleeve cover by depressing the locking tab on the front of the handle with a coin or flat object and pulling the handle away from the top or display area of the instrument.

Place 3 approved batteries into the battery holder. For best results hold the battery compartment so that it lays in your right hand. With your left hand install the battery that goes toward the front first. The battery that is in contact with the rear spring second and finally insert the third battery in the center by forcing the second battery such that the spring compresses and allows the batteries to go into place. If you do not use your right hand to hold the bottom of the battery compartment the batteries can come out.

Observe the polarity markings on the inside of the battery holder. Improper installation will cause the instrument not to operate. Replace the battery sleeve and allow the locking tab to snap into position.

Check to be sure the handle is secure to the instrument body by gently pulling the handle away. The handle will remain firmly in place if a proper connection is made.

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Check to be sure the handle is secure to the instrument body by gently pulling the handle away. The handle will remain firmly in place if a proper connection is made.


OPERATION AND USE

 **CAUTION:** Always start your SENSIT® HCN in a gas free environment to insure a proper zero.

1. Push the POWER/MUTE BUTTON . A beep will be heard during any button activation.
2. If the display fails to illuminate or "BAT LOW" is shown on the display, replace or recharge the batteries. There is room in the carrying case to keep an extra set of alkaline batteries.
3. Upon successful start-up, the pump will start and the display will illuminate. The instrument will then display:
 - a. a. Product name and software version.
 - b. b. System check for proper pump and battery operation.
 - c. c. Date and time.
 - d. d. Serial Number.
 - e. e. Display "CAL PAST DUE" only when calibration is overdue.
 - f. f. Warm-up countdown for 10 seconds.
 - g. g. Display "AUTOZERO" indicating the zeroing of all sensors.
 - h. h. Any sensor that is completely inoperable during start up will be indicated by "FAIL" on the display in the location where readings would normally be located. The GREEN READY LIGHT will not illuminate indicating the instrument requires service

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OPERATION AND USE

- 4. Prior to use, use your finger to block the inlet of the instrument for 4-5 seconds. The display will read "FLOW BLOCKED" if all seals are intact. During pump flow block, a beep will occur every 2 seconds until the pump restarts and adequate flow is present.

 **CAUTION:** Always operate this instrument with Filter Kit or the High Temperature Probe installed. This will prevent water or debris from damaging the internal pump.

- 5. When testing areas with elevated temperatures always attach the optional hot air probe assembly. Attach the probe by twisting the connector of the probe onto the matching adapter at the end of the instrument.

These connections need only be finger tight. It is necessary to use a particle filter when performing flue testing. The use of an unapproved probe assembly may void the warranty.

 **CAUTION:** Do not handle the steel portion of any hot air probe after use as burns may occur!

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OPERATION AND USE

6. To disable the audible alarm press and release the POWER/MUTE **[A]** button. To enable the alarm press the POWER/MUTE **[A]** button again.
7. At any time the operator may save the readings on the display by pressing the SAVE/ZERO **[C]** button. This will save all readings for download at a later time. The memory is factory set to store 6 events. This can be adjusted from 1-100 at the factory. The most recent save is first during download.
8. Following department procedures move to the areas where gas readings are suspected or must be tested. Use necessary accessories to draw samples from areas not accessible with the instrument itself, such as confined spaces. During sampling the respective readings may change. Audible and visual alarms will activate when the preset limits are reached.
9. To save any displayed readings, press and release the SAVE/ZERO BUTTON **[C]**. The data saved can be viewed or downloaded later. Printouts are possible using the optional IR printer. See Menu operation for complete instructions.
10. When being used in dark areas an automatic backlight will illuminate the display.
11. To turn instrument off, push and hold the POWER/MUTE **[A]** button for 5-6 seconds until "POWER DOWN" appears on the display.

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CALIBRATION CHECK

To verify the accuracy of **SENSIT® HCN**, it must be exposed to a known concentration of test gas that will test any sensor combination included in your particular model. Any sensor that does not meet the specifications listed in this manual may require calibration or repair. A calibration check does not update the calibration due date. Full calibration is required to update these times.

A calibration past due message will be displayed during warm-up if calibration has not been performed per your company specified interval. Anytime it is suspected the **SENSIT® HCN** is not working properly, check calibration.

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USER MENU

The **SENSIT® HCN** has several user adjustable features in the USER MENU. These include:

PRINT MENU:	Printing session, calibration, Bar Hole Test logs and accessing Smart-Cal Automatic Calibration Station.
CALIBRATION:	Calibrate HCN and/or CO and access Smart-Cal Automatic Calibration Station.
POWER OFF:	Set the automatic shut off timer in minutes.
SET CLOCK:	Set date and time.
SHOW CAL LOG:	Display last calibration of all gasses.
SHOW SES LOG:	Display saved gas reading data with date and time.
BUMP TEST:	Perform automatic test for response to minimum of 80% of calibrated gas value within 45 seconds.
SMART-CAL:	Access automatic calibration station.
O2 TEST:	O2 TEST

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SHOW SES LOG:	Display saved gas reading data with date and time.
BUMP TEST:	Perform automatic test for response to minimum of 80% of calibrated gas value within 45 seconds.
SMART-CAL:	Access automatic calibration station.
O2 TEST:	O2 TEST

USER MENU OPERATION

PRINT MENU

From the working display access the menu by pressing and holding the MENU [B] button until the top line of the display reads USER MENU.

The bottom line will read PRINT MENU. Press the MENU [B] button to access the PRINT MENU options. Use the SAVE/ZERO [C] button to select the CAL LOG or SESSION LOG option.

At this time prepare the printer. Aim the IR LED on the right side of the instrument to the IR receptor on the printer.

Press the MENU [B] button to print the data. Pressing the POWER/MUTE [A] button will reenter the USER MENU.

Use the SAVE/ZERO [C] button at this time to scroll to another menu function as indicated by the top line reading USER MENU.

Pressing the POWER/MUTE [A] button will return the instrument to the working (gas readings) display.

USER MENU OPERATION

PRINT MENU

From the working display access the menu by pressing and holding the MENU [B] button until the top line of the display reads USER MENU.

The bottom line will read PRINT MENU. Press the MENU [B] button to access the PRINT MENU options. Use the SAVE/ZERO [C] button to select the CAL LOG or SESSION LOG option.

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Press the MENU [B] button to print the data. Pressing the POWER/MUTE [A] button will reenter the USER MENU.

Use the SAVE/ZERO [C] button at this time to scroll to another menu function as indicated by the top line reading USER MENU.

Pressing the POWER/MUTE [A] button will return the instrument to the working (gas readings) display.

USER MENU OPERATION

POWER OFF

From the working display access the menu by pressing and holding the MENU **[B]** button until the top line of the display reads USER MENU.

Press and release the SAVE/ZERO **[C]** button until the bottom line displays POWER OFF. Press the MENU **[B]** button.

Use the SAVE/ZERO **[C]** button to increase the number of minutes of run time and the MENU **[B]** button to reduce them.

Setting the timer to 0 will cause the unit to always remain on. After adjusting the number, press and release the POWER/MUTE **[A]** button to save the adjustment.

Use the SAVE/ZERO **[C]** button at this time to scroll to another menu function as indicated by the top line reading USER MENU.

Pressing the POWER/MUTE **[A]** button will return the instrument to the working (gas readings) display.

USER MENU OPERATION

POWER OFF

From the working display access the menu by pressing and holding the MENU **[B]** button until the top line of the display reads USER MENU.

Press and release the SAVE/ZERO **[C]** button until the bottom line displays POWER OFF. Press the MENU **[B]** button.

Use the SAVE/ZERO **[C]** button to increase the number of minutes of run time and the MENU **[B]** button to reduce them.

Setting the timer to 0 will cause the unit to always remain on. After adjusting the number, press and release the POWER/MUTE **[A]** button to save the adjustment.

Use the SAVE/ZERO **[C]** button at this time to scroll to another menu function as indicated by the top line reading USER MENU.

Pressing the POWER/MUTE **[A]** button will return the instrument to the working (gas readings) display.

USER MENU OPERATION

SET CLOCK

From the working display access the menu by pressing and holding the MENU [B] button until the top line of the display reads USER MENU.

Press and release the SAVE/ZERO [C] button until the bottom line displays SET CLOCK. Press the MENU [B] button. The day will flash upon entering the SET CLOCK option.

The SAVE/ZERO [C] button advances to the next item and the MENU [B] button changes the flashing item. All settings are based on US time and date settings using a 24 hour clock.

After adjusting all numbers press and release the POWER/MUTE [A] button to save the adjustment.

Use the SAVE/ZERO [C] button to scroll to another menu function as indicated by the top line reading USER MENU.

Pressing the POWER/MUTE [A] button will return the instrument to the working (gas readings) display.

USER MENU OPERATION

SET CLOCK

From the working display access the menu by pressing and holding the MENU [B] button until the top line of the display reads USER MENU.

Press and release the SAVE/ZERO [C] button until the bottom line displays SET CLOCK. Press the MENU [B] button. The day will flash upon entering the SET CLOCK option.

The SAVE/ZERO [C] button advances to the next item and the MENU [B] button changes the flashing item. All settings are based on US time and date settings using a 24 hour clock.

After adjusting all numbers press and release the POWER/MUTE [A] button to save the adjustment.

Use the SAVE/ZERO [C] button to scroll to another menu function as indicated by the top line reading USER MENU.

Pressing the POWER/MUTE [A] button will return the instrument to the working (gas readings) display.

USER MENU OPERATION

SHOW A CALIBRATION LOG

From the working display access the menu by pressing and holding the POWER/MUTE [A] button until the top line of the display reads USER MENU.

Press and release the SAVE/ZERO [C] button until the bottom line displays SHOW CAL LOG. Press the MENU [B] button.

At this time one of the gases and the last calibration date will be displayed. Use the SAVE/ZERO [C] button to review all other calibrations dates and their respective gases.

After review of the last available gas the instrument will automatically return to the user menu as indicated by the top line reading USER MENU. Pressing the POWER/MUTE [A] button will return the instrument to the working (gas readings) display.

USER MENU OPERATION

SHOW A CALIBRATION LOG

From the working display access the menu by pressing and holding the POWER/MUTE [A] button until the top line of the display reads USER MENU.

Press and release the SAVE/ZERO [C] button until the bottom line displays SHOW CAL LOG. Press the MENU [B] button.

At this time one of the gases and the last calibration date will be displayed. Use the SAVE/ZERO [C] button to review all other calibrations dates and their respective gases.

After review of the last available gas the instrument will automatically return to the user menu as indicated by the top line reading USER MENU. Pressing the POWER/MUTE [A] button will return the instrument to the working (gas readings) display.

USER MENU OPERATION

SHOW A SESSION LOG

From the working display access the menu by pressing and holding the MENU [B] button until the top line of the display reads USER MENU.

Press and release the SAVE/ZERO [C] button until the bottom line displays SHOW SES LOG. Press the MENU [B] button.

Use the SAVE/ZERO [C] button to scroll to the saved session you wish to review. SESSION 1 is the most recent data saved.

Pressing the MENU [B] button will display the date and time of that session. Pressing the MENU [B] button again will display the gas reading.

Pressing the SAVE/ZERO [C] button will allow you to scroll through all other gas readings.

Press the POWER/MUTE [A] button to return to SESSION (No.) and pressing the SAVE/ZERO [C] button will allow you to review all previously saved SESSION's by date.

Press the MENU [B] button to review the gas data. Pressing the POWER/MUTE [A] button 3 times will return you to the USER MENU.

Pressing the POWER/MUTE [A] button once more returns you to the working display.

The number of stored session log saves is factory set at 6. It can store up to 16 by changing factory settings (contact factory for instructions).

USER MENU OPERATION

SHOW A SESSION LOG

From the working display access the menu by pressing and holding the MENU [B] button until the top line of the display reads USER MENU.

Press and release the SAVE/ZERO [C] button until the bottom line displays SHOW SES LOG. Press the MENU [B] button.

Use the SAVE/ZERO [C] button to scroll to the saved session you wish to review. SESSION 1 is the most recent data saved.

Pressing the MENU [B] button will display the date and time of that session. Pressing the MENU [B] button again will display the gas reading.

Pressing the SAVE/ZERO [C] button will allow you to scroll through all other gas readings.

Press the POWER/MUTE [A] button to return to SESSION (No.) and pressing the SAVE/ZERO [C] button will allow you to review all previously saved SESSION's by date.

Press the MENU [B] button to review the gas data. Pressing the POWER/MUTE [A] button 3 times will return you to the USER MENU.

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The number of stored session log saves is factory set at 6. It can store up to 16 by changing factory settings (contact factory for instructions).

TESTS AND CALIBRATION

BUMP TEST

From the working display access the menu by pressing and holding the MENU **[B]** button until the top line of the display reads USER MENU.

Press and release the SAVE/ZERO **[C]** button until the bottom line displays BUMP TEST.

Prepare 100ppm CO for application to the instrument. Attach the hose to the inlet connection. Turn on the gas.

Press the MENU **[B]** button. EACH GAS must read 80% of calibrated value within 45 seconds. The readings are on the left and the timer is on the right side of the display.

If the instrument passes, the display will read BUMP TEST PASSES and a beep will sound.

If the instrument fails, the display will read BUMP TEST FAILED and a beep will sound.

At the end of any bump test press the POWER/MUTE **[A]** button to return to the working display.

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At the end of any bump test press the POWER/MUTE **[A]** button to return to the working display.

TESTS AND CALIBRATION

SMART-CAL

From the working display access the menu by pressing and holding the POWER/MUTE **[A]** button until the top line of the display reads USER MENU. Press and release the SAVE/ZERO **[C]** button until the bottom line displays SMART CAL.

Place the instrument into the cradle provided on the left side of the SmartCal Calibration Station. Attach the tubing from the station to the inlet side of the instrument.

Press the center button. The display will show “SMART CAL Communicating” and the pump will turn off. Select the test from the SmartCal Station to be performed. At the end of the test the instrument will beep 3 times and display PASS or FAIL.

Retry the test if necessary by pressing the proper button on the Smart-Cal Station again. Press the left button to return the working display, remove the tubing and return instrument to service or send instrument to the proper place for repair per company procedures.

SHORTCUT TO ACCESS SMART-CAL:

Place the instrument into the cradle provided on the left side of the SmartCal calibration Station. Attach the tubing from the station to the inlet side of the instrument.

While in the working display press the power button for 2-3 seconds and release. The display will show “SMART CAL Communicating” and the pump will turn off. Perform all tests as described in the SMART CAL section.

TESTS AND CALIBRATION

SMART-CAL

From the working display access the menu by pressing and holding the POWER/MUTE **[A]** button until the top line of the display reads USER MENU. Press and release the SAVE/ZERO **[C]** button until the bottom line displays SMART CAL.

Place the instrument into the cradle provided on the left side of the SmartCal Calibration Station. Attach the tubing from the station to the inlet side of the instrument.

Press the center button. The display will show “SMART CAL Communicating” and the pump will turn off. Select the test from the SmartCal Station to be performed. At the end of the test the instrument will beep 3 times and display PASS or FAIL.

Retry the test if necessary by pressing the proper button on the Smart-Cal Station again. Press the left button to return the working display, remove the tubing and return instrument to service or send instrument to the proper place for repair per company procedures.

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CALIBRATION

From the menu options, it is possible to calibrate the sensor in the **SENSIT® HCN** instrument. Calibration is the process of setting the readings of the instrument to certified calibration gases.


When calibrating, the numbers shown on the display represent the numbers seen by the microprocessor. These readings should not be confused with actual gas readings.

Prior to any calibration, power the instrument in a gas free environment. Allow 5 minutes of additional warm-up time and manually zero the instrument using the SAVE/ZERO  button.

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CALIBRATION

From the working display access the menu by pressing and holding the MENU **[B]** button until the top line of the display reads USER MENU.

Press and release the SAVE/ZERO **[C]** button until the bottom line displays CALIBRATION. Press the MENU **[B]**. The top line will now read CALIBRATION.

HYDROGEN CYANIDE (HCN) CALIBRATION (HCN 10PPM)

To calibrate HCN, push the MENU **[B]** when the top line reads CALIBRATION and the bottom line reads HCN 10 PPM.

Immediately apply 10 ppm HCN.

When the reading is satisfactory, the display will read DATA SAVED indicating calibration is complete. The date for CAL PAST DUE is automatically reset at this point.

Pressing the POWER/MUTE **[A]** button will return the instrument to the working (gas readings) display. Remove the gas.

CALIBRATION

From the working display access the menu by pressing and holding the MENU **[B]** button until the top line of the display reads USER MENU.

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Pressing the POWER/MUTE **[A]** button will return the instrument to the working (gas readings) display. Remove the gas.

MANUAL CALIBRATION

CARBON MONOXIDE (CO) CALIBRATION (100PPM CO/AIR)

To calibrate CO, push the MENU **[B]** when the top line reads CALIBRATION and the bottom line reads CO 100 PPM.

Immediately apply 100 ppm CO (balance air).

When the reading is satisfactory, the display will read DATA SAVED indicating calibration is complete.

The date for CAL PAST DUE is automatically reset at this point.

Pressing the POWER/MUTE **[A]** button will return the instrument to the working (gas readings) display. Remove the gas.

NOTE: Improper calibration is indicated by “Bad Cal” when save is attempted. Calibration will be based on the last successful calibration. Recalibration is recommended. The calibration due date will not be updated until successful calibration has occurred. Any instrument that does not calibrate requires service. Contact SENSIT Technologies for details.

CAUTION: Using calibration kits other than the recommended kit may cause inaccurate readings. Repairs are required if any sensor fails to calibrate. Contact manufacturer for details.

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CARBON MONOXIDE (CO) CALIBRATION (100PPM CO/AIR)

To calibrate CO, push the MENU **[B]** when the top line reads CALIBRATION and the bottom line reads CO 100 PPM.

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When the reading is satisfactory, the display will read DATA SAVED indicating calibration is complete.

The date for CAL PAST DUE is automatically reset at this point.

Pressing the POWER/MUTE **[A]** button will return the instrument to the working (gas readings) display. Remove the gas.

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CAUTION: Using calibration kits other than the recommended kit may cause inaccurate readings. Repairs are required if any sensor fails to calibrate. Contact manufacturer for details.

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WARRANTY

Your SENSIT® HCN is warranted to be free from defects in materials and workmanship for a period of two years after purchase (excluding sensors, calibration and batteries). If within the warranty period, your instrument should become inoperative from such defects, the unit will be repaired or replaced at our option. This warranty covers normal use and does not cover damage which occurs in shipment or failure which results from alteration, tampering, accident, misuse, abuse, neglect or improper maintenance. Proof of purchase may be required before warranty is rendered. Units out of warranty will be repaired for a service charge. Internal repair or maintenance must be completed by an authorized technician. Violation will void warranty. Units must be returned postpaid, insured and to the attention of the Service Dept. for warranty or repair.

This warranty gives you specific legal rights and you may have other rights which vary from state to state.

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Fax: 219.465.2701
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SENSIT

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