

INSTRUCTION MANUAL

SENSIT[®] HXG-3

Combustible Gas Detector


Read and understand instructions before use.

CE  II 3 G

EEx ic IIB T3

IP 20

ATEX File No. NA45026-01X


 **Warning:** To reduce the risk of ignition of a flammable atmosphere, batteries must only be changed in an area known to be nonflammable.





 **SENSIT**
Technologies

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


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.

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

 **NOTICE:** LEL sensor should be checked for accuracy after exposure to any gases containing silicones, high sulfur content, high concentrations of propane and high concentrations of CO (above 1000ppm) or exhaust gases. Continuously low calibration check results or fluctuation of zero readings may indicate sensor end of life or failure. Consult Sensit Technologies with any questions.


For best accuracy always zero in clean air environments similar in temperature and relative humidity to the environment where the instrument will be used. When continuously exposed to combustible gas concentrations beyond LEL for longer than 5 minutes always perform a calibration check prior to the next use.

 **Warning:** To reduce the risk of ignition of a flammable atmosphere, batteries must only be changed in an area known to be nonflammable.

Do not mix batteries of different age or type.

Not for use in atmospheres of oxygen greater than 21%.

ONLY zero instrument in a gas free environment.

 **Warning:** To maintain intrinsic safety, service must be performed by factory authorized technicians with approved replacement parts only.

CONTENTS

Preparation

For Your Safety	ii
Parts and Accessories	5
General Description	6
Sensor Specifications	7
Product Specifications	7
Product Features	8-10
Sensor Type	11

Basic Operation

Battery Installation/Replacement	12
Operation and Use	13-16
Calibration Check	17

User Menu and Detailed Operation

User Menu / Function Descriptions	18
Printing to Optional IR Printer	19
Calibration, Power Off	20
Set Clock	21
Show Calibration Log	22
Show Session Log	23

CONTENTS

Tests and Calibration

Bump Test.....	24
Smart-Cal	25-26
Gas Type	27
Calibration Notes, Preparing For Calibration.....	28
Combustible Gas Calibration.....	29-30
(50% LEL Methane, 50% LEL Propane or 50% LEL Pentane)	
Factory Adjustable Features.....	31
Warranty	Back Cover

PARTS AND ACCESSORIES

Standard Accessories (Included)

872-00001	Hard Carrying Case
360-00040	Wrist Strap
310-00004	3”C” Alkaline Batteries
750-00024	Instruction Manual

Accessories and Replacement Parts

375-2611-01	LEL Sensor
365-00045	Sensor Cap without Filter Disc
870-00012	Extension Adapter
870-00004	IR Printer
870-00039	IR Link Interface w/ SmartLink Software
914-00000-01	Smart-Cal Automatic Calibration Station

Calibration Kits

881-00015	Calibration Kit – Methane
881-00073	Calibration Kit – Propane
881-00077	Calibration Kit – Pentane

Contact us with instrument model number for correct Calibration Kit.

GENERAL DESCRIPTION

The **SENSIT® HXG-3** is designed to detect combustible gases. All **SENSIT® HXG-3** instruments incorporate an advanced low power semiconductor sensor to measure combustible gases in LEL (Lower Explosive Limit) range.

LEL resolution can be factory set between 0.1% and 2%. The ppm display is simultaneously shown in 1 or 10ppm increments (resolution). If enabled, the peak reading display takes precedence over the ppm display.

An automatically backlit display shows all gas concentrations being measured. LEDs located on the front of the instrument indicate preset visual warnings of increased gas concentration.

Audible and visual alarms warn the operator of hazardous conditions being sensed. The preset alarms are indicated by a red flashing LED, display indicator and alarm sound. The combustible gas alarm is preset from 50% LEL (2.5% methane, 1.1% propane or 0.75% pentane).

The **SENSIT® HXG-3** instrument is approved for the ATEX Directive EN60079-0:2004 & EN60079-11:2007 when used with Duracell™ PC1400 or VARTA# 4914 Alkaline cells.

SPECIFICATIONS

SENSOR SPECIFICATIONS

TYPE	RESOLUTION	RANGE	ACCURACY
LEAK METHANE	1ppm or 10ppm	0-50,000ppm	±10%
LEAK PROPANE	1ppm or 10ppm	0-22,000ppm	±10%
LEAK PENTANE	1ppm or 10ppm	0-15,000ppm	±10%
LEL*	0.1% to 2%	0-100%	±10%

*Factory Adjustable

PRODUCT SPECIFICATIONS

Size: 11.5" x 3" x 2.32" (292 x 76 x 69 mm)

Weight: 1.2 lbs. (544 g)

Operational Temp: -20° to 40° C (-4 to 104° F)

Battery Life: Alkaline: 25 hrs. continuous

The **SENSIT® HXG-3** instrument is approved for the ATEX Directive EN60079-0:2004 & EN60079-11:2007 when used with Duracell™ PC1400 or VARTA# 4914 Alkaline cells.

CE  II 3 G

EEx ic IIB T3

IP 20

ATEX File No. NA45026-01X

PRODUCT FEATURES



PRODUCT FEATURES

SENSIT® HXG-3 instruments are constructed of durable Nylon 66 plastic to withstand the rigors of field use.

Incorporated in the hand grip area is the battery compartment. All **SENSIT® HXG-3** instruments require 3 “C” type alkaline batteries. Duracell PC1400 batteries provide approximately 25 hours of continuous use.

A thumbwheel is located on the right side of the instrument to activate the audible tick sound that helps in locating the source of a gas leak. This tick is generated by using specialized circuitry in combination with the LEL sensor located at the end of the gooseneck assembly.

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

The Infrared Communication window is located on the right side to allow the **SENSIT® HXG-3** instrument to

1. Communicate with Smart-Cal Calibration Station.
2. Communicate with IR-Link Computer Interface.
3. Download calibration data
4. Download readings the operator has elected to save to the instrument's on-board memory.

PRODUCT FEATURES

A flexible gooseneck is used to assist in locating the source of gas leaks and remote sampling.

A two line display continuously updates the operator of all available gas concentrations and alarms simultaneously as well as indicates low battery power.

Below the display is a series of LEDs that are preset to indicate combustible gas concentrations. During an alarm condition the red Hazard 3 LED will flash and an audible warning will sound.

There are 3 operational button pads on the front of all **SENSIT® HXG-3** instruments.

BUTTON (A) POWER/MUTE

Operates POWER and MUTE features and exit menu items.

BUTTON (B) MENU

Use to enter, change and select menu items.

BUTTON (C) SAVE/ZERO

Use for save data feature, manually zero sensors, scroll and change menu items.


SENSOR TYPE

Combustible Gas Sensor

All **SENSIT® HXG-3** instruments incorporate a highly sensitive semiconductor type sensor. The function and accuracy of the sensor are monitored and controlled by specialized circuitry and a microprocessor. This sensor is capable of measuring concentrations of 1ppm or 10ppm of methane (natural), propane or pentane gas up to 100% LEL.

NOTE: Operating the instrument without a sensor cap or with an altered sensor cap can cause damage to the instrument and void the warranty.

BATTERY INSTALLATION/REPLACEMENT

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

 **Warning:** Do not mix batteries of different type or age.

Battery replacement is necessary when the display reads BAT LOW, an audible alarm sounds and the green ready LED flashes. When the instrument remains in BAT LOW, a countdown will appear starting at 300 seconds (5 minutes) which is the maximum time remaining to shutdown.

Remove the battery sleeve cover by removing the battery sleeve screw with a T-8 screwdriver. Depress the locking tab on the front of the handle with a coin or flat object and pull the battery sleeve 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 one hand. With the other 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 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 for proper battery installation. Improper installation will cause the instrument not to operate. Replace the battery sleeve and allow the locking tab to snap into position. Replace the battery sleeve retaining screw.

NOTE: Improper battery installation will disable the instrument.

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 any **SENSIT® HXG-3** in a gas free environment to insure a proper zero.

1. Press and hold the POWER/MUTE button (A) until the display illuminates.
2. If the display fails to illuminate or BAT LOW is shown on the display replace the batteries.
3. During successful start-up the instrument will display:
 - a. Product name and model version
 - b. System check
 - c. Date and time
 - d. Gas Type
 - e. CAL PAST DUE when calibration is overdue
 - f. Warm-up countdown
 - g. AUTOZERO indicating the zeroing of the sensor
 - h. Working display

NOTE: If a sensor is completely inoperable or improperly zeroed at start up, the display will show ERROR LEL followed by FAIL.

OPERATION AND USE

4. Display

Model	Displays	Resolution
3.30	LEL% only	0.1% - 2%*
3.30 w/PK% option	LEL%	0.1% - 2%*
	PK%	0.1% - 2%*
3.35	LEL%	0.1% - 2%*
	ppm	1ppm or 10ppm
3.35 w/PK% option	LEL%	0.1% - 2%*
	PK%	0.1% - 2%*

*Factory adjustable at time order.

5. It may be necessary to manually zero the instrument based on company practices and environmental conditions. Manually zeroing the instrument will clear the PK% reading.

 **CAUTION: Always start any SENSIT® HXG-3 in a gas free environment to insure a proper zero.**

6. When testing high areas or overhead lines the use of the optional extension adapter will allow a broom handle or painters stick to extend the instrument to the area where sensing must be accomplished. This slides onto the battery sleeve and is held in place by the locking nut assembly.

OPERATION AND USE

7. When a gas is sensed the display will update. Additionally, a series of LEDs on the front of the instrument will illuminate when the preset concentrations of the calibration gas are reached. If an alarm condition exists, based on a preset alarm point, the red (HAZ 3) LED will flash and the alarm will sound.

The preset levels of the LED warning lights are:

Amber LED/Low	5 - 9.9% LEL
Red LED/Haz1	10.0 - 24.9% LEL
Red LED/Haz2	25.0 - 49.9% LEL
Red LED/Haz3	50.0 - 100% LEL

8. During an alarm condition (factory default at 50% LEL) the display will flash, red (HAZ 3) LED will flash and an audible alarm will sound indicating a potentially unsafe environment. To disable the audible alarm press and release the POWER/MUTE button (A). To enable the alarm press and release it again.

9. To assist in locating the source of small combustible gas leaks or surveying areas outdoors or indoors, rotate the thumbwheel located on the right side of the instrument until a steady ticking sound is heard.

Note: There is no warm-up for this feature as it uses the LEL sensor that is already operating.

Move the sensor toward the area suspected of leakage. As the sensor moves closer to a leak source the tick will increase. When the tick becomes a steady tone rotate the thumbwheel in a clockwise direction while keeping the sensor in the same position.

Continued on next page.

OPERATION AND USE

Continued from previous page.

This will slow down the tick and allow the operator to find a higher concentration using the same procedure. If the tick goes away you have moved away from the leak or there is no more gas present.

For best results always use the leak detector prior to using any liquid leak detection fluids as these sensors will detect their presence.

10. At any time the operator may save the readings on the display by pressing the SAVE/ZERO button (C). 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.

11. Following Federal, State, Municipal and/or Company procedures move to the areas where gas readings are suspected or must be tested. During sampling the respective readings may change. Audible and visual alarms will activate when the preset limits are reached.

12. When being used in dark areas an automatic backlight will illuminate the display.

13. To turn instrument off, press and hold the POWER/MUTE button (A) for 5-6 seconds until POWER DOWN appears on the display.

CALIBRATION CHECK

To verify the accuracy of any **SENSIT® HXG-3**, it must be exposed to a known concentration of test gas. Any sensor that does not meet the specifications listed in this manual may require calibration or replacement. A calibration check does not update the calibration due date. Full calibration is required to update this feature.

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® HXG-3** is not working properly, check calibration.

USER MENU

The **SENSIT® HXG-3** has several features in the user menu.

These include:

- PRINT MENU:** SESSION LOG - print data that was saved.
CAL LOG - print last 4 successful calibrations.
SMART CAL - access to Smart-Cal Calibration Station.
- CALIBRATION:** Calibrate LEL and access Smart-Cal Calibration Station.
- POWER OFF:** Set the automatic shut off timer in minutes.
- SET CLOCK:** Set date and time.
- SHOW CAL LOG:** Display last calibration for the currently selected gas type.
- 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 30 seconds.
- SMART-CAL:** Access automatic calibration station.
- GAS TYPE:** Select natural/methane, propane or pentane as primary gas to be sensed.

USER MENU OPERATION

PRINT MENU

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

The bottom line will read PRINT MENU. Press the MENU button (B) to access the print menu options.

Use the SAVE/ZERO button (C) to select the CAL LOG or SESSION LOG.

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

Position the instrument 6-12" from the IR receptor and press the MENU button (B). Downloading will begin immediately.

When the display no longer reads PRINTING... use the SAVE/ZERO button (C) to scroll to another PRINT MENU function.

Pressing the POWER/MUTE button (A) will will return to the USER MENU. Use the SAVE/ZERO button (C) at this time to scroll to another menu function.

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

USER MENU OPERATION

CALIBRATION (see page 28 for complete instructions)

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

Press and release the SAVE/ZERO button (C) until the bottom line displays CALIBRATION.

POWER OFF

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

Press and release the SAVE/ZERO button (C) until the bottom line displays POWER OFF. Press the MENU button (B).

Use the SAVE/ZERO button (C) to increase the number of minutes of run time and the MENU button (B) to reduce them. Setting the timer to 0 will cause the unit to always remain on.

After adjusting the number, press and release the left button (A) to save the adjustment. Use the SAVE/ZERO button (C) at this time to scroll to another menu function.

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

USER MENU OPERATION

SET CLOCK

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

Press and release the SAVE/ZERO button (C) until the bottom line displays SET CLOCK.

Press and release the MENU button (B). The day will flash upon entering the SET CLOCK option. Press and release the MENU button (B) to change the current item. The SAVE/ZERO button (C) advances to the next item. The clock is based on U.S. time and date settings using a 24 hour clock.

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

Use the SAVE/ZERO button (C) at this time to scroll to another menu function in the USER MENU.

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

USER MENU OPERATION

SHOW A CALIBRATION LOG

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

Press and release the SAVE/ZERO button (C) until the bottom line displays SHOW CAL LOG.

Press the MENU button (B) and the display will show the last calibration date.

Pressing any button will return the display to the user menu.

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

Note: The calibration log only shows information for the currently selected gas type.

USER MENU OPERATION

SHOW A SESSION LOG

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

Press and release the SAVE/ZERO button (C) until the bottom line displays SHOW SES LOG.

Press the MENU button (B). Use the SAVE/ZERO button (C) to scroll to the saved session you wish to review. SESSION 1 is the most recent data saved.

Pressing the MENU button (B) will display the date and time of that session. Pressing the MENU button (B) again will display the PK% reading, if the PK% feature is available. Pressing the MENU button (B) again will display the LEL% reading.

Press the POWER/MUTE button (A) to return to SESSION(#) and pressing the SAVE/ZERO button (C) will allow you to scroll all previously saved SESSIONS.

Pressing the POWER/MUTE button (A) 2 times will return the instrument to the USER MENU. Pressing the POWER/MUTE button (A) once more returns the instrument to the working display.

The number of stored session log saves is factory set at 6. It can store up to 100 by changing a factory setting (contact SENSIT TECHNOLOGIES for instructions).

TESTS AND CALIBRATION

BUMP TEST

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

Press and release the SAVE/ZERO button (C) until the bottom line displays BUMP TEST.

Prepare 50% LEL methane (or propane or pentane) calibration gas for application to the instrument.

Apply calibration gas to the instrument sensor.

Press the MENU button (B). The reading must read 80% of calibrated value within 30 seconds. The reading is on the left side and the timer is on the right side of the display.

If the instrument passes, the display will read BUMP TEST PASSES, a beep will sound and the unit display will automatically return to the user menu.

If the instrument fails, the display will read BUMP TEST FAILED and a beep will sound. Repeated bump test failure indicates possible need for instrument repair. Contact SENSIT Technologies for instructions.

At the end of any bump test press the POWER/MUTE button (A) to return to the working display.

TESTS AND CALIBRATION

SMART-CAL (Methane and/or Propane Calibration Only)

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

Press and release the SAVE/ZERO button (C) until the bottom line displays SMART CAL.

Place the instrument into the cradle provided on the left side of the Smart-Cal Calibration Station. Attach the tubing from the station to the instrument sensor.

Press the MENU button (B). The display will show SMART CAL Communicating. Select the test from the Smart-Cal 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 and release the POWER/MUTE button (A) 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.

TESTS AND CALIBRATION

SMART-CAL

SHORTCUT TO ACCESS SMART-CAL:

Place the instrument into the cradle provided on the left side of the Smart-Cal calibration Station.

Attach the tubing from the station to the instrument sensor.

While in the working display press the POWER/MUTE button (A) for 2-3 seconds and release.

The display will show SMART CAL Communicating. Perform all tests as described in the SMART CAL section.

TESTS AND CALIBRATION

GAS TYPE

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

Press and release the SAVE/ZERO BUTTON (C) until the bottom line displays GAS TYPE.

Press the MENU BUTTON (B). Press Button (B) or Button (C) to change between PEN (Pentane), NAT (Natural or Methane) or PRO (Propane) as primary gas to be sensed. Press Button (A) to confirm selection is made.

CALIBRATION

Calibration is the process of setting the readings of the sensors in the instrument to equal the value of certified calibration gases.

NOTES:

Using calibration kits other than recommended by SENSIT TECHNOLOGIES may cause inaccurate readings.

Repairs are required if any sensor fails to calibrate. Consult SENSIT TECHNOLOGIES for details.

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

These readings will update every 5 seconds during calibration.

CALIBRATION

COMBUSTIBLE GAS CALIBRATION PROCEDURE (50%LEL METHANE, 50%LEL PROPANE OR 50%LEL PENTANE)

The calibration gas used for this procedure should match the Gas Type selected for your instrument. Refer to Gas Type in the Menu section of this manual.

Instruments set to methane will calibrate with 50% LEL (2.5% V/V) methane/air. Instruments set to propane will calibrate with 50% LEL (1.1% V/V) propane/air. Instruments set to pentane will calibrate with 50% LEL (0.75% V/V) pentane/air.

STEP 1 - Prior to calibration allow the instrument to operate for 5 minutes in a gas free environment. Manually zero the instrument by press and holding the (C) button until the display shows AUTOZERO.

STEP 2 - Prepare the corresponding calibration gas (methane or pentane), regulator and adapter. Turn off the tick rate before calibrating.

STEP 3 - From the working display access the USER MENU by pressing and holding the (B) button until the top line of the display reads USER MENU. Press and release the (C) button and the bottom line should read CALIBRATION. Press and release the (B) button, the top line will read CALIBRATION and the bottom line will read LEL 50%.

STEP 4 - Apply the appropriate calibration gas for your instruments set-up and press the (B) button to start the automated calibration process.

If calibration is successful, the display will flash DATA SAVED before automatically returning to the calibration menu. Pressing the (A) button repeatedly will return the instrument to the working display. Remember to disconnect and shut off the gas supply.

CALIBRATION

COMBUSTIBLE GAS CALIBRATION PROCEDURE (50%LEL METHANE, 50%LEL PROPANE OR 50%LEL PENTANE)

(Continued)

If calibration is unsuccessful, the display will flash BAD CAL before returning to the calibration menu. In the event of a BAD CAL, remove the instrument from service and contact SENSIT Technologies for assistance.

NOTE: Calibration will be based on the last successful calibration. 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.

FACTORY ADJUSTABLE FEATURES

(Factory Only)

FEATURE	RANGE	DEFAULT
Session Saves	1-100	6
Alarm - LEL	0-100%	50%
PPM Display Option	1ppm or 10ppm	10ppm
Cal Due interval	30, 45, 60, 90, 180, 360 Days	30 Days
Show Session Log*	1-100	6
Warm-up Time	10-30 sec.	30 sec.
Purge Time	1-60 sec.	0 sec.
LEL Resolution	0.1% - 2%	0.1%
Peak Reading	N/A	Off

*Can be disabled

WARRANTY

Your **SENSIT® HXG-3** is warranted to be free from defects in materials and workmanship for a period of two years after purchase (excluding 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 a SENSIT TECHNOLOGIES authorized technician. Violation will void warranty. Units must be returned postpaid, insured and to the attention of the Service Dept. for warranty or repair.

SENSIT Technologies
851 Transport Drive
Valparaiso, IN 46383

Phone: (219) 465-2700
888 4 SENSIT (473-6748)
Fax: (219) 465-2701

MADE IN THE USA
WITH GLOBALLY SOURCED COMPONENTS

SENSIT HXG-3 ATEX Instruction Manual
Part # 750-00024

Revision 12-15-2017