# SENSIT® IRED

## INFRARED ETHANE DETECTOR

# INSTRUCTION MANUAL

### READ AND UNDERSTAND INSTRUCTIONS BEFORE USE

## Warnings:

- To prevent ignition of flammable or combustible atmospheres disconnect power before servicing in an area known to be free of combustible gases.

- Charge battery pack in an area known to be free of combustible gases.

- Use only Sensit Technologies battery pack.

- Service may only be performed by factory authorized service technicians

- Not for use in environments greater than 21% oxygen.

## Safety Precautions:

- Read and understand instructions prior to use.

- Always start the IRED in an area known to be gas free.

- Tampering with this product may void the warranty.

- Use only Sensit Technologies approved parts and accessories.

- Never use an instrument known to be damaged, operating unusually, or out of calibration.

## Tips:

- Be sure battery is charged before each days use.

- Check probe for damage before each use.

- Check filters before each days use.

**For further information contact Sensit Technologies.**

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# General Description

The SENSIT® Infrared Ethane Dectector, referred to as "IRED", is designed to detect the presence of ethane gas in a methane gas sample.   The IRED can detect 250 parts per billion (ppb) up to 500ppm ethane.  The IRED is used to determine if methane detected in the range of 50-2000ppm is of similar make-up to that of pipeline gas (which contains ethane) or is naturally occurring methane from other sources such as organic decay. The IRED is not designed for high concentrations or determining actual ethane content from within a pipeline.

The IRED senses gas using Infrared (IR) Absorption Spectroscopy in combination with an electronic narrow band-pass filter.  This technology utilizes an infrared light source with an output that is changed when certain gases absorb the light output.  The filter only allows specific light wavelengths to be monitored and measured.  The concentration of gas is proportional to the amount of specific IR light absorbed and is displayed in PPB or PPM.

The IRED has a large display indicating both sustained and peak reading concentrations and other instrument functions. An internal pump provides rapid sampling into the detection chamber.  Bluetooth data transmission provides communication of real time and stored data. Optional GPS with Data Logging allow for further recording of time, date and location data.

READY LED    ERROR LED    FILTER    INFRARED COMMUNICATIONS

SOUNDER

"D" RING

BACK LIGHT SENSOR

GRAPHIC DISPLAY    OPERATION BUTTONS

TELESCOPIC SURVEY BOOT and PROBE ROD

Patented

CE

**TO OPERATE:**

1. **Press Power**
2. **Wait for Automatic Zeroing**
3. **Begin to Use**

# Parts and Accessories

## Standard Accessories

Compact Carrying Case                                  Part # 872-00021
Telescopic Survey Probe                                Part # 883-00029
Instrument Handle Strap                                Part # 360-00464
Hot Swap Vehicle Battery                               Part # 871-00030
Universal Wall Charger                                 Part # 871-00025
Battery Door Removal Tool                              Part # 360-00249
Hydrophobic Filter Ring Assembly (10 Pack)             Part # 873-00033
Survey Probe Filter (Blue) (1 Filter)                  Part # 360-00064
Instruction Manual                                     Part # 750-00061

For IRED w/GPS:
SmartLink Log Viewer Software                          Part# 870-00040
SmartLink Installation Guide                           Part# 750-00051

## SENSIT® IRED Calibration Kit

IRED Calibration Kit                                   Part # 881-00100

Kit includes:
(1) Regulator, (1) Cal Adapter
(1) 100pm Ethane/Nitrogen 58L

## SENSIT® IRED Replacement Cylinders

100ppm Ethane/Nitrogen 58L                             Part # 315-120010

## SENSIT® IRED Bump Test Kit

IRED Bump Test Kit                                     Part # 881-00101

Kit includes:
(1) Regulator, (1) Cal Adapter,
(1) 1000ppm CH4/10ppm Ethane 58L

## SENSIT® IRED Replacement Cylinder for Bump Test

1000ppm CH4/10ppm Ethane 58L                           Part # 315-120005

# Product Specifications

## Operational Specifications

Temperature:        -4°F to 122°F (-20°C to 50°C)
Duty Cycle:        6 hours
Test time:        40 seconds (After warm up and zeroing)
Display:        Visual – Backlight display
        Visual – Concentration, Test Status,  Instructional Prompts
        Visual – Failure indicators
Power:        Lithium Ion Rechargeable battery pack
        Optional Vehicle charger adapter
Pump Flow:        1.0 lpm
Sample Size Range:    50-2000ppm Methane

## Physical Specifications

Size:        11.625" x 5.25" x 8.375" (Approximate) (11.6cm x 13.3cm x 21.3cm)
Weight:        7.41Lbs (7.41kg)
Construction:        Aluminum/ABS Plastic

## Sensor Specifications

IR Sensor:        Method: Advanced Infrared Absorption Spectroscopy
        Detection Range 250ppb – 500ppm
        Warm up < 30 min
        Calibration required - 3 months

## Product Features
- The IRED is constructed of durable ABS Plastic
- The housing is designed to meet IP54 protection
- Battery pack is designed for easy field replacement
- Field or Smart Cal calibration is easily performed
- External filters are inexpensive easy to change
- The LCD display is easy to read
- The IRED uses a simple "Sensit Style" user interface
- Communication with other devices is easy with Bluetooth interface
- Real time GPS is optional
- Data logging of results for download to printer or computer
- Bluetooth and infrared communication

# Electronic Features

## User Interface

The user interface includes the following features:
- Three button operation
- LED Status indicators
- Sounder
- Photo cell (automatic backlighting)
- IR communication port
- LCD

## Button Operation

The Sensit IRED is operated with
the use of three buttons below
the display.

They are labeled A, B, C.

The "A" button:
- Activates/Deactivates the instrument
- Acknowledge Test Fuction
- Access Smart-Cal Calibration Functions
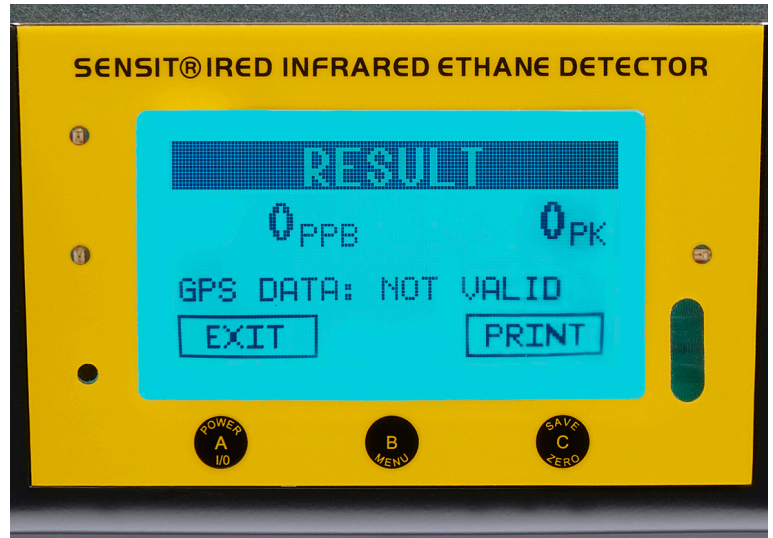
The "B" button:
- Starts Operation Functions

The "C" button:
- Access Menu
- Print Results
- Activates/Deactivate Pump

# Display Features

The display provides all information including:
- Ethane concentration in PPB and PPM
- Flow Blocked Indicator
- GPS activation and coordinates
- Warning Menu

# Housing Features

## Battery Pack

The battery pack is located on the back side of the instrument housing. The batteries are Lithium Ion rechargeable and only available from Sensit Technologies.

To remove the battery pack turn the retaining screws ¼ turn. Pull the bottom of the pack away from the main housing. The battery pack may be charged while still in the main housing, but the instrument will not be able to be used during this time.
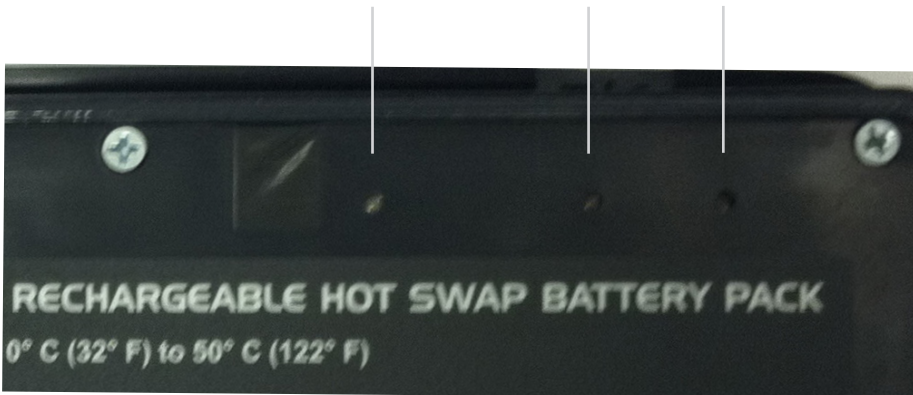
To replace, slide the top tabs of the battery pack into the retainers at the top of the main housing. Push the bottom into place and turn and lock the retaining screws.



The battery pack has LEDs to indicate charge status. Charging should only be performed in an area known to be free of combustible gases.



The battery pack may also be charged while operating in a vehicle. Connect the 12v DC adapter into the vehicle power outlet and the external port on the battery housing. This can be connected and disconnected while the IRED is operating.

When the charger is disconnected, the words "WARM UP", "PLEASE WAIT" (flashing) are displayed and a 180 second countdown is started/displayed. The user can not perform a measurment until the countdown expires. The instrument will only operate when on battery power.

# Gas Inlet and Outlet

Located on the front of the main housing is the gas inlet and outlet. Both are fitted with luer-style connections for easy connection to probe accessories.

The center connection is the gas inlet. To the right is the outlet. Do not block gas outlet.

# Handle Strap / Shoulder Strap attachment

"D" rings are located on each side of the main housing for handle strap / shoulder strap attachments. Clips on the strap will attach securely.

# Hydrophobic Filter Assembly

**WARNING:** Do not operate without proper filter. Damage may occur to the pump and other internal parts. Only change filter with pump or instrument off.

The gas inlet is protected by a hydrophobic filter.

To replace the filter:
1. Detach any probe assembly
2. Twist and remove filter cap
3. Remove and replace filter disc
4. Check "O" ring inside cap
5. Replace filter cap
6. Perform flow block test

Additional filters are located in each of the accessory probe assemblies.

# Operation and Field Use

1. To activate the instrument press and hold the POWER (A) button until the display illuminates. The following warm up sequence will occur on the display (a-g):

    a. Sensit Logo will appear

    b. System Check
       i. Failures will be listed, if any occur
          1. Pressing the A button will turn off the instrument
          2. Pressing the B button will display the next error if more than one has occurred
          3. Pressing the C button will skip past the error to continue warm up. A password is required to skip the error message. Wrong password will cause the error message screen to be displayed.
       ii. Use the B and/or C button to adjust the password.
       iii. Press the A button to accept the entry.

    c. Serial number, Software Revision, Date and Time.

    d. Flow Check
       i. If the Flow Check is successful, PASSED will be displayed.
       ii. If the Flow Check is unsuccessful, ensure that nothing is obstructing the inlet or exhaust, and check the integrity of the hydrophobic filter.

    e. Warm up is indicated "PLEASE WAIT" with a 600 second countdown timer. The countdown timer will begin after an initial warm up of 5-10 minutes.

    f. Cell Check
       i. This is a 5 step process that tests the integrity of the internal cell.
       ii. The process takes approximately 7.5 minutes to complete.
          1. Clean Air
          2. Methane Cell In
          3. Temperature Adjustment
          4. Methane Cell In
          5. Clean Air
       iii. If the Cell Check fails, restart the instrument.
            If the process is unable to successfully complete, service is required.

    g. Calibration due date indicating when calibration will need to be done or PAST DUE indicating calibration date has been exceeded. If calibration is required:
       i. Pressing the A button will turn off the instrument
       ii. Pressing the B button will begin the calibration process
       iii. Pressing the C button will skip past the calibration required message to continue warm up.

    h Auto Bump test function to validate sensitivity to ethane (if option is activated)
       i. Pressing the A button will turn off the instrument.
       ii. Pressing the B button will begin the bump test process.
       iii. Pressing the C button will skip past the bump test requirement to continue warm up.

    i. Working mode display indicated by "READY FOR MEASUREMENT" on the display and ready LED illunimated.

# Operation and Field Use (Continued)

2. From the IRED", "READY FOR MEASUREMENT" display press and release the B button to "START" a measurement.

    a. The instrument will perform a zeroing process
        i. Apply air known to be free of methane or ethane gas. Pump must be "ON". Do not turn off.
        ii. Press the B button "OK" to accept
        iii. "SAMPLING CLEAN AIR" will be displayed with information showing the outputs for modulator (M) and light level (L) sensors. A stable reading must occur before the process automatically continues.
        iv. A cell containing methane is introduced to the light path internally as displayed by "METHANE CELL-IN". Also displayed is information showing the outputs for modulator (M) and light level (L) sensors. A stable reading must occur before the process automatically continues.
        v. If the reading is not stable the zeroing process will automatically re-initiate indicated by a "RE-ZEROING" message. This process requires and addition 120-180 seconds as indicated by a countdown timer.
        vi. A stable reading is indicated by a displayed message "PLEASE BEGIN SAMPLING"

    b. Attach the probe (Telescopic Probe or Bar Hole Probe) and place the probe in the area to be tested. Press the B button "START" within the time indicated on the countdown timer (120 seconds).

    c. The measuring of ethane is indicated by the "MEASUREMENT" heading and the ppb/ppm readings. During a measurement, 4 consecutive 10 second readings are taken. The display will be updated with the reading every 10 seconds until the 40 second period has elapsed. The final reading is indicated when the "RESULT" heading is displayed. Real-time readings are on the left. Peak readings are on the right. Press A button to exit or C button to print.

        i. If the methane concentration is too high a message will be displayed (background too high), indicating the need to re-zero and attempt measuring again.
        ii. For high readings move the probe slightly away from the previous source. For accurate results methane concentrations of 50-2000 ppm are required.

    d. Ethane concentration is indicated on the display showing "RESULT" and the reading. The information is also stored in the "MEASUREMENT LOG" for later download and/or review.

    e. Pressing the A button "EXIT" will return to the main screen displaying "IRED", "READY FOR MEASUREMENT".

3. Pressing and holding the A button will activate the standby mode or shut down sequence. The display will show "SHUT DOWN" on the left side and "STAND BY" on the right. Press the A button to turn the instrument off. Press the C button to place into standby mode to reduce battery consumption. This will also reduce the warm up time to a few minutes. Standby mode should only be used for up to two hours.

# Bump Test

From the work display (READY FOR MEASUREMENT) press and release the C Button until BUMP TEST is displayed.  Press the B Button to START the bump test. The instrument will perform the zeroing process.

1.  Apply air known to be free of methane gas

2.  Press the B button "OK" to accept

3.  "SAMPLING CLEAN AIR" will be displayed with information showing the outputs for modulator (M) and light level (L) sensors. A stable reading must occur before the process automatically continues.

4.  A cell containing methane is introduced to the light path internally as displayed by "METHANE CELL-IN". Also displayed is information showing the outputs for modulator (M) and light level (L) sensors. A stable reading must occur before the process automatically continues.

5.  If the reading is not stable the zeroing process will automatically re-initiate indicated by a "RE-ZEROING" message.  This process requires an additional 120-180 seconds as indicated by a countdown timer.

6.  A stable reading is indicated by a displayed message "BUMP TEST", 10 PPM ETHANE, 30 SECONDS.

7.  Attach the bump test gas of 10ppm ethane/1000ppm methane/balance air

8.  Press the B button to start the measurement

9.  If successful, the result will display "PASSED". Press the A button to return to the USER MENU or the B Button to print.

10. Bump test results are logged for later viewing and/or download.

11. If unsuccessful, press the A button to exit to USER MENU or press the C button to RETAKE.

12. Several failed bump tests indicates calibration or repair may be necessary.  See calibration portion of this manual next.

# Calibration

From the work display (READY FOR MEASUREMENT) press and release the "C" Button until CALIBRATION is displayed.  Press the "B" Button to START the CALIBRATION. The instrument will perform the zeroing process.

1. Apply air known to be free of methane gas

2. Press the "B" button "OK" to accept

3. "SAMPLING CLEAN AIR" will be displayed with information showing the outputs for methane (M) and light level (L) sensors. A stable reading must occur before the process automatically continues.

4. A cell containing methane is introduced to the light path internally as displayed by "METHANE CELL-IN". Also displayed is information showing the outputs for methane (M) and light level (L) sensors. A stable reading must occur before the process automatically continues.

5. If the reading is not stable the zeroing process will automatically re-initiate indicated by a "RE-ZEROING" message.  This process requires and addition 120-180 seconds as indicated by a countdown timer.

6. A stable reading is indicated by a displayed message "CALIBRATING",
   PLEASE APPLY 100 PPM ETHANE, 30 SECONDS.

7. Attach the calibration gas of 100ppm ethane/balance nitrogen

8. Press the B button to start the measurement

9. If successful, the result will display "PASSED". Press the A button to return to the USER MENU.

10. Calibration results are logged for later viewing and/or download.

11. If unsuccessful, press the A button to exit to USER MENU. Atttempt to re-calibrate.

12. Several failed calibrations indicate service or repair may be necessary.
    Contact Sensit Technologies for assistance.

# SMART-CAL Calibration

From the work display, press and hold the "A" button for 1 to 2 seconds. SMART-CAL will be displayed.

1. Place unit in the cradle battery side down with the display facing the calibration station.
2. Attach the instrument hose to the inlet of the IRED.
3. For calibration, press and release the left (calibrate) button on the station.
4. For bump test, press and release the right button (bump test) button on the station.

# USER MENU

To access the menu press and release the "C" button.  From this menu the following features can be viewed by pressing the "C" button to scroll through the options. Enter the selection by pressing the "B" button and adjusting by using the "C" button or the onscreen prompts.  Pressing the "A" button repeatedly will return you to the working display.

| No. | Name | Description |
|---|---|---|
| 1 | WARNINGS | 1. SD Card not inserted |
| | | 2. Blue Tooth not communicating |
| | | 3. GPS not communicating |
| | | 4. BUMP Test skipped |
| | | 5. Calibration Skipped |
| 2. | BUMP TEST | Allow user to perform Bump Test |
| 3. | CALIBRATION | Allow user to perform Calibration |
| 4. | VIEW BUMP LOG | Allow user to scroll and view bump log including autobump log. |
| 5. | VIEW CAL LOG | Allow user to scroll and view calibration log including skipped log. |
| 6. | VIEW MEAS LOG | Allow user to view measurement log |
| 7. | ERASE MEAS LOG | Allow user to erase measurement log. This will erase all measurement logs. |
| 8. | ACTIVATE GPS | This option is only available if GPS failed activation initially. |
| 9. | SET TIME | Allow user to set time. |
| 10. | SET DATE | Allow user to set date. |
| 11. | VIEW SETTINGS | Allow user to view settings of device. it lists all settings including expert and factory level settings. |
| 12. | EXPERT MENU | Provide access to expert menu |
| 13. | FACOTRY MENU | Provide access to factory menu |
| 14. | TEST MENU | Provide access to test menu |

# EXPERT MENU

To access the expert menu from the work display (READY FOR MEASURENT) press the release the "C" button until EXPERT MENU is displayed. Press and release the "B" button to enter. This menu is password protected. Enter the password using the "C" Button to increase and "B" Button to decrease the password number. Once password is set press "A" Button to enter the menu.

From this menu the following features can be viewed by pressing the "C" button to scroll through the options. Enter the selection by pressing the "B" button and adjusting by using the "C" button or the onscreen prompts. Pressing the "A" button repeated will return you to the working display.

| No. | Name | Default | Description |
|-----|------|---------|-------------|
| 1 | CONTRAST | 36 | Set contrast of display |
| 2. | LANGUAGE | English | Allows you to select language of the system |
| 3. | CAL FLOW | | |
| 4. | ADVANCE CALIBRATION | | |
| 5. | CAL PPM | 100 | Allows you to select PPM used for calibration. |
| 6. | CAL INTERVAL | 90 | Set how often calibration should be performed. |
| 7. | BUMP INTERVAL | 0 | Set how often bump test should be performed. |
| 8. | BUMP PPM | 10 | Allows you to set PPM used for manual bump test. |
| 9. | BUMP LO LIMIT | 80 | This is in %. Define minimum bump test response required to pass test. |
| 10. | BUMP HI LIMIT | 120 | This is in %. Define maximum bump test response required to pass test. |
| 11. | PURGE TIME | 10 | Time in Sec unit should purge system before shutting down. |
| 12. | ERASE BUMP LOG | | Allows you to erase bump logs. |
| 13. | ERASE CAL LOG | | Allows you to erase calibration logs. |
| 14. | ERASE MEAS LOG | | Allows you to erase measurement logs. |
| 15. | CELL CHECK | | Begin process to detect if cell is leaking. |
| 16. | SCAL PUMP CH4 | Disable | Set to turn pump on or off during bump test when using Cal-Station. |
| 17. | SCAL PUMP C2H6 | Disable | Set to turn pump on or off during calibration when using Cal-Station. |

# Ethane (C2H6) to Methane (CH4) Ratio

With the use of a Sensit IRED and PMD you can accurately and efficiently determine the percentage of ethane in a methane sample between 50-2400ppm. There are two methods to achieve the desired results which are outlined below. The picture below depicts the telescopic probe (barhole probe may also be used) attached to the inlet of the IRED (with pump on) and the PMD (with pump off) inlet attached to the exhaust of the IRED. This allows both devices too simultaneously analyze the same sample.

## Method 1 - Procedure for IRED/PMD Paired Sample Analysis to Simultaneously Analyze the Same Sample

1. With the probe of choice attached to the inlet of the PMD (Pump On), search for an acceptable stable sample size ranging from 50-2400ppm CH4.
2. Disconnect the probe tubing from the PMD (leave the probe in place). Turn the PMD pump off and attach the pairing hose to the IRED exhaust and the PMD inlet.
3. Start the zeroing process on the IRED. Upon the completion of the zero process, the IRED will beep and a 120 seconds countdown timer will be displayed.
4. Attach the probe of choice that is still in place from step 2 to the inlet of the IRED and press the "B" button to start the test. The test will last 40 seconds.
5. During the test, monitor the PMD methane readings. Note the peak methane reading during the 40 second test. This will be required to establish a ratio.
6. At the end of the test, the IRED will display "RESULT" and beep. The peak ethane reading will be displayed.
7. Based on the peak methane and ethane readings, reference the methane/ethane ratio chart provided in this section.
8. Repeat steps 1 through 7 to perform another analysis.


## Method 2 - Procedure IRED/PMD Independent Sample Analysis

1. With the probe of choice attached to the inlet of the PMD, search for an acceptable stable sample size ranging from 50-2400ppm CH4.
2. Start the zeroing process on the IRED. Upon the completion of the zero process, the IRED will beep and a 120 second countdown timer will be displayed.
3. Note the methane reading on the PMD. This will be required to establish a ratio. Disconnect the probe tubing from the PMD (leave the probe in place) and attach the probe to the inlet of the IRED. Press the "B" button on the IRED to begin the 40 second measurement.
4. At the end of the test, the IRED will display "RESULT" and beep. The peak ethane reading will be displayed.
5. Reference the methane/ethane ratio chart provided in this section.
6. Repeat steps 1 through 5 to perform another analysis.

# Methane/Ethane Ratio Chart

| Methane PPM | Pipeline Ethane content | | | | | |
|---|---|---|---|---|---|---|
| | 1% | 2% | 3% | 4% | 5% | 6% |
| 50 | 500ppb | 1 | 1.5 | 2 | 2.5 | 3 |
| 100 | 1 | 2 | 3 | 4 | 5 | 6 |
| 150 | 1.5 | 3 | 4.5 | 6 | 7.5 | 9 |
| 200 | 2 | 4 | 6 | 8 | 10 | 12 |
| 250 | 2.5 | 5 | 7.5 | 10 | 12.5 | 15 |
| 300 | 3 | 6 | 9 | 12 | 15 | 18 |
| 350 | 3.5 | 7 | 10.5 | 14 | 17.5 | 21 |
| 400 | 4 | 8 | 12 | 16 | 20 | 24 |
| 450 | 4.5 | 9 | 13.5 | 18 | 22.5 | 27 |
| 500 | 5 | 10 | 15 | 20 | 25 | 30 |
| 550 | 5.5 | 11 | 16.5 | 22 | 27.5 | 33 |
| 600 | 6 | 12 | 18 | 24 | 30 | 36 |

| Methane PPM | Pipeline Ethane content | | | | | |
|---|---|---|---|---|---|---|
| | 1% | 2% | 3% | 4% | 5% | 6% |
| 1250 | 12.5 | 25 | 37.5 | 50 | 62.5 | 75 |
| 1300 | 13 | 26 | 39 | 52 | 65 | 78 |
| 1350 | 13.5 | 27 | 40.5 | 54 | 67.5 | 81 |
| 1400 | 14 | 28 | 42 | 56 | 70 | 84 |
| 1450 | 14.5 | 29 | 43.5 | 58 | 72.5 | 87 |
| 1500 | 15 | 30 | 45 | 60 | 75 | 90 |
| 1550 | 15.5 | 31 | 46.5 | 62 | 77.5 | 93 |
| 1600 | 16 | 32 | 48 | 64 | 80 | 96 |
| 1650 | 16.5 | 33 | 49.5 | 66 | 82.5 | 99 |
| 1700 | 17 | 34 | 51 | 68 | 85 | 102 |
| 1750 | 17.5 | 35 | 52.5 | 70 | 87.5 | 105 |
| 1800 | 18 | 36 | 54 | 72 | 90 | 108 |

| Methane PPM | Pipeline Ethane content | | | | | |
|---|---|---|---|---|---|---|
| | 1% | 2% | 3% | 4% | 5% | 6% |
| 650 | 6.5 | 13 | 19.5 | 26 | 32.5 | 39 |
| 700 | 7 | 14 | 21 | 28 | 35 | 42 |
| 750 | 7.5 | 15 | 22.5 | 30 | 37.5 | 45 |
| 800 | 8 | 16 | 24 | 32 | 40 | 48 |
| 850 | 8.5 | 17 | 25.5 | 34 | 42.5 | 51 |
| 900 | 9 | 18 | 27 | 36 | 45 | 54 |
| 950 | 9.5 | 19 | 28.5 | 38 | 47.5 | 57 |
| 1000 | 10 | 20 | 30 | 40 | 50 | 60 |
| 1050 | 10.5 | 21 | 31.5 | 42 | 52.5 | 63 |
| 1100 | 11 | 22 | 33 | 44 | 55 | 66 |
| 1150 | 11.5 | 23 | 34.5 | 46 | 57.5 | 69 |
| 1200 | 12 | 24 | 36 | 48 | 60 | 72 |

| Methane PPM | Pipeline Ethane content | | | | | |
|---|---|---|---|---|---|---|
| | 1% | 2% | 3% | 4% | 5% | 6% |
| 1850 | 18.5 | 37 | 55.5 | 74 | 92.5 | 111 |
| 1900 | 19 | 38 | 57 | 76 | 95 | 114 |
| 1950 | 19.5 | 39 | 58.5 | 78 | 97.5 | 117 |
| 2000 | 20 | 40 | 60 | 80 | 100 | 120 |
| 2050 | 20.5 | 41 | 61.5 | 82 | 102.5 | 123 |
| 2100 | 21 | 42 | 63 | 84 | 105 | 126 |
| 2150 | 21.5 | 43 | 64.5 | 86 | 107.5 | 129 |
| 2200 | 22 | 44 | 66 | 88 | 110 | 132 |
| 2250 | 22.5 | 45 | 67.5 | 90 | 112.5 | 135 |
| 2300 | 23 | 46 | 69 | 92 | 115 | 138 |
| 2350 | 23.5 | 47 | 70.5 | 94 | 117.5 | 141 |
| 2400 | 24 | 48 | 72 | 96 | 120 | 144 |

# NOTES

# Warranty

Your Sensit IRED is warranted to be free from defects in materials and workmanship for a period of two years after purchase (excluding calibration).  If within the warranty period the instrument should become inoperative from such defects the instrument 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 performed by a Sensit Technologies authorized technician.  Violation will void the warranty. Units must be returned postpaid, insured and to the attention of the service department 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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