INSTRUCTION MANUAL

SENSIT® P400 GAS MONITOR

Read and understand instructions before use.

For use with combustible gases and optionally available oxygen and toxic gases.
Intrinsically safe for use in:

CLASSIFIED UL 7WA6

For Class 1, Division 1, Groups A, B, C and D Hazardous locations when used with approved alkaline batteries or rechargeable battery pack.
IP65
Temp code: T4, -20° C to 50° C

CE 0891 Ex II 2 G
Ex d ia IIC T4, Gb, IP65
-20° C to 50° C
DEMKO 12 ATEX 1102012

Manufactured by:
SENSIT Technologies

Warning!
To reduce the risk of explosion do not mix old batteries with used batteries, or mix batteries from different manufacturers.

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

Warning:
Substitution of components may impair intrinsic safety.

Warning:
Not for use in atmosphere of oxygen greater than 21%

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

CAUTION:
Lithium backup cell may explode if mistreated. Do not recharge, disassemble or dispose of in fire.

SENSIT® P400 Instruction Manual

TABLE OF CONTENTS

General Description

The Sensit P400 is a state of the art personal gas monitor used to alert users of potentially hazardous gases in the work area. This monitor may have 1-5 sensors installed including combustible gas (LEL only), oxygen and/or 2 additional toxics such as CO, SO2, HCN and H2S. A combination CO/H2S sensor is available as a single sensor location.

Alarms are in 3 forms. Audible alarms are 98db; visual via 6 super-bright LEDS and enhanced display readings; vibration from the vibrating motor. Unique alarms for Low level (preset), time weighted average (TWA) based on 8 hour average exposure maximums, short term exposure limit (STEL) based on 15 minute average exposure maximums, high levels for immediate health threats, total or accumulated exposure over time, and "high-high" for potential immediate danger.

Operator safety is uniquely and efficiently increased with the use of the Immediate Detection System (IDS). The IDS provides the operator a tick style indication that gas conditions are changing, before the alarm level. If so equipped, this feature can be enabled through the supervisor menu.

The housing is made of a field proven brand of polycarbonate (LEXAN) with a permanently adhered rubber-like protective outer covering. This is resilient to environmental factors and most impacts.

The buttons located on the side of the housing provide simple and intuitive user operation.

The user menu has several user functions plus a supervisor set-up selection. This allows a supervisor to make adjustments to those operational features field personnel should not be adjusting. This is password protected.

A graphic display provides all readings and information. On screen prompts and information make use very simple.

A single green LED at the top indicates the instrument is functioning properly, bump test and calibration have been performed as required.

Calibration is accomplished either manually using the menu function or using a SCal 400 automatic docking station. The manual calibration process is extremely simple. Once the menu item is selected attach the gas and wait for the process to be completed.

Data logging is automatic if enabled. The internal memory provides approximately 75 hours of capacity. Uploading is accomplished using the Link-400 Station with SmartLink Sofware.

SENSIT® P400 GAS MONITOR

PARTS AND ACCESSORIES

Standard Accessories
(Included with Instrument)
- Four alkaline batteries
- Battery door removal tool (#0 Phillips)
- Filter removal tool (3/32 Allen Wrench)
- Calibration cup
- Instruction manual

Replacement Parts
- Sensor Filter
- Belt clip
- Battery pack – alkaline
- Battery pack – rechargeable

Optional Accessories
- Confined space entry probe w/hand aspirator
- Motorized pump
- Confined space entry probe
- Confined space entry probe filters – coalescing
- Bump test adapter
- Calibration kits
- SCal 400 Station
  - o Network connections and software separate
- Data logging Report Software - SmartLink
- Rechargeable Battery Pack
- Battery Charger Station

Physical Specifications

Size:	5.2" x 3.2" x 1.7" (13.2x8.1x4.0 cm)
Weight:	12oz oz. (340g)
Construction:	Certified to IP65
Intrinsic Safety:	Certified to:
	UL913 Class 1 Div 1 Group ABCD T4
	ATEX II 2 G Ex ia d IIC T4
	Designed to meet (pending approval)
	IECEX Ex ia d IIC T4
	CSA 22.2 No's 157 & 152

Safety Precautions

- ✓ After any exposure to high concentrations (beyond LEL) of combustible gases the instrument should be tested for proper operation (see bump test). High concentrations of such gases may damage the sensor.
- ✓ LEL sensor poisoning may occur after exposure to gases that contain silicone, lead, halogens and sulfur. If exposure has occurred or may be suspected the instrument should be tested for proper operation (see bump test).
- ✓ For Canada, prior to each days use a bump test is required.
- ✓ Read and understand instructions prior to use.
- ✓ Always start the instrument in a gas free environment.
- ✓ Do not use in environments exceeding 21% oxygen content.
- ✓ Do not mix batteries of different type or age.
- ✓ Service can only be performed by factory authorized personnel.
- ✓ Tampering with this product may void warranty.
- ✓ Only use Sensit Technologies approved parts and accessories.
- ✓ Do not change batteries or service in a combustible atmosphere.
- ✓ Never use an instrument known to be damaged or out of calibration.

Operational Specifications

Temperature:	-4° to 122° F (-20 to 50C)
Humidity:	10 - 90% RH (Non Condensing)
Duty Cycle:	8 hours (Default)
Response time:	T90 ≤ 20 Seconds

Alarms

Sound:	98db @ 15" (30cm)
Sight:	Display Alerts 6 - 270° viewable red LED's (all sides)
Touch:	Vibration
Settings:	All Alarms are set at OSHA values. Three levels of alarm depending on concentration or time weighted average (TWA) and short term exposure level (STEL) requirements. Low, TWA, STEL, High and High-High alarms are differentiated by alarm sound and displayed message. **Immediate Detection System: Optional** Tick increases at 50, 60, 70, 80, 90% of alarm values for toxic sensors. LEL Sensor tick increases are at 10 – 90% of alarm value in 10% increments.
Power Source:	4 "AA" type alkaline batteries Use only PROCELL PC1500 NiMH rechargeable battery pack SENSIT PART NO 871-00021
Pump flow:	≥0.35 lpm (optional external pump)
Battery life:	≥ 24 hours continuous operation (alkaline) ≥ 15 hours cont. operation (rechargeable)
Response Time:	Initial response <3 seconds T90 LEL CO H2S O2 <20seconds

Sensor Specifications & Alarms

LEL (catalytic)

0 – 100% LEL with over range protection.
Calibration gas selections include methane, propane and pentane.

0.1-2.0 (adjustable) % LEL resolution; ±10% of read accuracy;
Low Alarm = 10%; High Alarm = 20%; HHigh Alarm = 50%;
Calibration gas is 50%LEL of CH4, Propane or Pentane.

Oxygen (galvanic fuel cell)

0 – 25% 0.1% resolution; ±0.2% of scale accuracy;
High Alarm = ≤19.5% and ≥23.5%;
Low and HH Alarms not activated;
Bump gas is 18.5% oxygen

Carbon Monoxide (electrochemical)

0 –999ppm (extended range available 0-1999ppm);
1ppm resolution; ±5ppm or10% of read accuracy;
Low Alarm = 50ppm; High Alarm = 200ppm; HH not activated;
Calibration gas is 100ppm CO

Hydrogen Sulfide (electrochemical)

0 – 100ppm; 1ppm (0.1 option) resolution; ±2ppm or 10% of read accuracy;
Low Alarm = 10ppm; High Alarm = 25ppm; HH not activated;
Calibration gas is 25ppm H2S.

Hydrogen Cyanide (electrochemical)

0 – 30ppm; 0.1ppm resolution; ±1ppm or 10% of read accuracy;
Low Alarm = 4.7ppm; High Alarm= 10ppm; HH not activated;
Calibration gas is 10ppm HCN.

Sensor Specifications & Alarms (Continued)

Chlorine (electrochemical)

0 – 30ppm; 0.1ppm resolution; ±1ppm or 10% of read accuracy;
Low Alarm = 5ppm; High Alarm = 10ppm; HH not activated;
Calibration gas is 5ppm Cl2.

Sulfur Dioxide (electrochemical)

0 – 20ppm; 0.1ppm resolution; ±1ppm or 10% of read accuracy;
Low Alarm = 10ppm; High Alarm = 25ppm; HH not activated;
Calibration gas is 10ppm SO2

Nitrogen dioxide (electrochemical)

0 – 250ppm; 1ppm resolution; ±2ppm or10% of read accuracy;
Low Alarm = 10ppm; High Alarm = 25ppm; HH not activated;
Calibration gas is 10ppm NO2

Ethylene oxide (electrochemical)

0 – 10ppm; 0.1ppm resolution; ±1ppm or 10% of read accuracy;
Low Alarm = 1ppm; High Alarm = 5ppm; HH not activated;
Calibration gas is 5ppm ETO.

Phosphine (electrochemical)

0 – 10ppm; 0.1ppm resolution; ±1ppm or 10% of read accuracy;
Low Alarm = 1ppm; High Alarm = 5ppm; HH not activated;
Calibration gas is 5ppm PH3.

Function Indicators

Display will indicate sensor type installed.

CO	=	Carbon Monoxide	NO2	=	Nitrogen Dioxide
O2	=	Oxygen	HCN	=	Hydrogen Cyanide
H2S	=	Hydrogen Sulfide	ETO	=	Ethylene Oxide
Cl2	=	Chlorine	PH3	=	Phosphine
SO2	=	Sulfur Dioxide			

Consult Sensit Technologies for additional sensor availability.

Combustible gas sensing displays the calibration gas type used.
Ch4=methane; PRO=propane; PEN=Pentane;

The letter "P" indicates the pump is operating

A SD card symbol indicates datalogging is activated "[SD]"

A letter "T" indicates the IDS is activated for the particular gas

Inadequate battery power is indicated by a beep and the display reading BAT LOW. The battery voltage is constantly displayed. BAT LOW is displayed at 4.2v. BAT FAIL at 4.0v.

Sensor failures are indicated by displaying FAIL in place of the sensor readings.

Air Flow block or inadequate pump output is indicated by the display reading FLOW BLOCKED and audible/visual alarms.

Properly attached pump is momentarily indicated by displaying "PUMP STARTING" followed by a 4 second countdown. When the pump is detached the display will show "PUMP DISABLED" and alarms will activate. Press the upper right button to acknowledge or properly reattach the pump.

Operation - Battery Installation - Alkaline Batteries

Caution: Always change batteries in an environment free of combustible gas. Follow your local regulations for proper disposal of alkaline batteries.

1. The battery compartment is located on the bottom of the back side of the housing. Loosen the four #0 Phillips type screws recessed at the top outer edges of the battery compartment cover.

2. Remove the battery compartment cover by pulling it away from the main body of the instrument at the top of the battery housing. This will release the bottom hinge locks for cover removal.

3. Remove and install four new approved alkaline "AA" type batteries. Note the polarity. If the batteries are installed incorrectly no damage to the instrument will occur though it will not operate.

4. Insert the bottom of the battery compartment cover into the housing and rotate the cover into position.

5. Tighten the four retaining screws. Do not over tighten.

Operation - Battery Installation - Rechargeable Pack

Caution: Always change batteries in an environment free of combustible gas. Use only Sensit Technologies approved battery pack. Follow your local regulations for proper disposal of the rechargeable battery pack.

1. The battery compartment is located on the bottom of the back side of the housing Loosen the four #0 Phillips type screws recessed at the top outer edges of the battery compartment cover.

2. Remove the battery compartment cover by pulling it away from the main body of the instrument at the top of the battery housing. This will release the bottom hinge locks for cover removal.

3. Loosen the #0 Phillips screw retaining at the base of the alkaline or rechargeable pack.

4. Gently remove the pack by pulling upward and allowing the battery pack retaining tabs to slide out of the holder.

5. Insert the retaining tabs of the battery pack into position and push gently into position.

6. Replace and secure the retaining screw. Do not over tighten.

7. Insert the bottom of the battery compartment cover into the housing and rotate the cover into position.

8. Tighten the four retaining screws. Do not over tighten.

9. Recharging is accomplished through the use of approved battery charger. Charging pins are located on the front housing of the P400.

Operation – Instrument Charging

Caution: Do not attempt to recharge alkaline batteries.
Use only Sensit Technologies battery pack and charger.

1. Connect battery charger to proper electrical source (100vac – 240vac) using supplied wall adapter. Do Not Substitute
   a. The green LED will illuminate

2. Lay the P400 face down into the charger cradle.
   a. Green LED on and flashing Red LED indicate charging in progress
   b. Green and Red LED constantly on indicate full charge
   c. Green and Red LED flashing indicate a charging error. Disconnect and retry.

Operation – Button use from working display

1. Power ON
   Press upper right button (O) until the display illuminates to power on.

2. Power OFF
   Press and hold upper right (O) + upper left (△) buttons for 6 seconds at the same time to power off.

3. Access User Menu
   Press and hold lower right (X) + lower left (▽) buttons for 3 seconds to access the user menu

4. Save Current Data (Snapshot)
   Press and hold any button for 2 seconds to save current data (snapshot)

5. Activate Backlight
   Press and release any button to activate the backlight for the preset time (30 seconds default).

6. Reset IDS
   Press and release any button to reset IDS indicator (if activated).

Operation – Button Use From Menu

1. Press and hold lower right (X) + lower left (▽) buttons for 3 seconds to access the user menu.
2. Press either the upper or lower left button to scroll through the selections.
3. Press the upper right button to select a menu item.
4. Press the lower right button to return to the working display.

Menu items include:

a. Set Time – change clock time (24hr basis)
b. Set Date – change date. ddMONyyyy format
c. Auto Zero – perform a re-zero of all sensors.
d. Auto Cal – Calibrate all sensors
e. Peak Hold – Show Peak readings on display (102 Maximum Entries)
f. Bump Test – Perform sensor/alarm function test
g. Bump Log – displays last 93 bump tests for each sensor including date/time (93 Maximum Entries)
h. Cal Log – displays last 10 gas calibrations for each sensor including date/time. (10 Maximum Entries)
i. Data Log – View contents of automatic data log. (10752 Maximum Entries)
j. Snapshots – View instant saves (100) which includes all readings and date/time (102 Maximum Entries)
k. Event Log – displays all alarm events including date/time (120 Maximum Entries)
l. Settings – Display operational info such as alarm settings
m. Supervisor – Supervisor adjustable features (password protected)

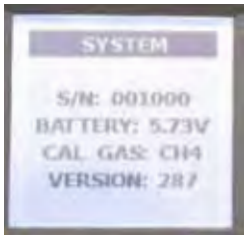
Operation - Start Up

Caution: Always start instruments in an area known to be of normal oxygen content and to be free of combustible gases and contaminants.

1. Push and hold the upper right button (O) until the instrument activates.

2. The instrument will perform a set of self tests. During this time the display will show:

   a. System Check
      i. Name of company/user (optional)
      ii. Serial number
      iii. Battery check
      iv. Calibration gas type
      v. Software version number
      vi. Time
      vii. Date



   b. UI Check – User Interface check (alarm activations)
      i. Top Red LED
      ii. Bottom Red LED
      iii. Top Green LED
      iv. Sounder
      v. Vibration
         1. Each alarm activation test is indicated by reverse display highlight and remains on for 3 seconds

   c. Warm Up
      i. Display "Please wait" for a minimum of 10 seconds.
      ii. If a power supply failure occurs, the instrument will display "SERVICE REQD" followed by a listing of the type of failure.

      VIB VOLT: FAIL indicating a voltage failure to the vibratory motor
      BIAS VOLT: FAIL indicating a voltage failure to the electrochemical sensors
      EX VOLT: FAIL indicating a failure to the combustible gas sensor

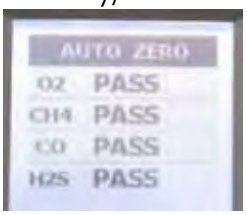
      A countdown timer will show the amount of time remaining before the instrument turns off.

      Pressing the two top buttons will also power the instrument off immediately.

      Consult Sensit Technologies for further assistance.

Operation - Start up (Continued)

d. Auto Zero – indicating automatic zeroing process (clean air only)
   i. Displays sensor type and PASS or FAIL
   ii. If a sensor indicates FAIL the information will be in reverse contrast.
      1. Press any button to acknowledge and continue warm up

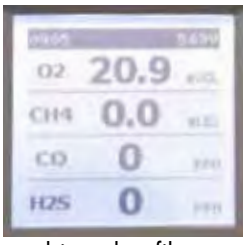


e. Calibration due dates (when scheduled calibration is due next)
   i. Displays sensor type and number of days remaining
   ii. If a sensor is past due the displayed information will be in reverse contrast
   iii. Press any button to acknowledge calibration past due (if activated).
      1. Use left side buttons to highlight SKIP or CALIBRATE
         a. SKIP allows operation. Info will be recorded
         b. CALIBRATE allows for immediate manual or automated calibration.

f. Optional Bump Test
   i. Display will prompt user to perform bump test if activated as part of the supervisor set up.
   ii. Onscreen selection allows SKIP or BUMP.
   iii. Bump test is updated automatically for next required test upon successful completion.

g. Sensit Logo will be displayed

h. Working display



3. All readings show horizontally “gas type” “concentration” “unit of measure” and IDS status (if enabled).

4. The instrument is now reading gases as filtered through the ambient dust filter on the front of the instrument.
   a. To check filter remove two 3/32 Allen screws from the front of the instrument. Check and/or clean filter prior to each days use with warm water only. For Filter Replacement, see page 22.

5. A green flickering LED indicates the instrument has been bump tested and calibrated per company regulations and is operating normally.

Caution:

Always check the filter membrane for damage or excessive dirt or dust which will prevent gas samples from being sensed.

Operation - Field Use

1. After successful start up, test the work area based on State, Federal, Municipal or Company work procedures.

2. To test confined spaces
    a. The entire instrument can be lowered with a tether by attaching to the ring on the suspender clip on the back of the instrument. When tethering, it is best to operate the instrument using the "Peak Hold" function. Use Menu Function to enable.

    b. Use a probe with the aspirator assembly. See page 27 for details.

    c. Use the Motorized sample system. See page 27 for details.

3. For instruments with the optional auxiliary pump attached, connect the probe assembly. Test each level you wish to check for 90 seconds to make sure the work area is safe.

4. During use in the work area, the suspender clip will secure the instrument to a belt or clothing. A "D" ring is part of the clip if you wish to hang the instrument near the area where personnel are performing work.

5. To view the display in a darkened environment, push and release any button. The backlight will remain on for 30 seconds.

6. The Immediate Detection System (IDS) will begin to tick when the preset value is exceeded. The tick will incrementally increase with each increased change in concentration. Push any button to reset.

7. During alarms conditions the backlight will illuminate, the LED's will flash, the vibrator will activate and the alarm sound will be heard. Only during LOW alarms when TWA alarms are activated can the sound be muted and the vibrator deactivated by pressing any button (Using snooze feature in supervisor menu-default is off so no mute is possible). The LED's will continue to flash during the mute phase.

Operation - Field Use (Continued)

8. During STEL alarms no muting or deactivating is possible.

9. During HIGH or HIGH HIGH alarms no muting or deactivating is possible.

10. Any gas that is in the alarm mode, the alarm type will be displayed in reverse dark contrast. If the IDS feature is activated, it will be reversed in gray contrast.

11. The LEL sensor has a maximum reading of 110%. This reading will latch if the oxygen level also drops below 15% while in this over-range reading.

12. Latching alarms, if the feature is activated, require the push of a button to disable any alarm only if the gas concentration has reduced at a non-alarm level.

13. When the shift time feature is enabled and the end of shift alarm activates press the button corresponding to Yes or No for continuing shift. Each acknowledgement adds one additional hour.

14. Snapshot is performed by pressing any button for 2-3 seconds. This will store all onscreen readings for upload or review. The screen will flash momentarily.

15. Battery low indication will activate when the battery voltage reaches 4.1v. At 4.0v the instrument will turn off.

16. If the automatic power off alert activates press any button to add one additional hour of runtime.

Alarms

Caution: During any alarm follow company procedures!

The Sensit P400 has a wide range of alarm types that can be activated through the User Set Up menu. The alarm types range from those with a simple set point to those using TWA and STEL measurements required by those customers with more sophisticated users or operational standards as implemented by an industrial hygienist.

Each alarm will cause a unique display message and alarm cycle to be heard based on the level or severity of the gas mixture present. During any alarm the working display will highlight the particular gas, the concentration and the backlight will be turned on. Other alarm indications will include:

- Low Alarm/TWA alarm = Display in reverse contrast; Display alarm type "Low" or "TWA"; Top and bottom LED's will flash and vibrating motor will operate for 1 second intervals; alarm sound will be heard; all alarms will repeat every 2 seconds; muting will cause the contrast to become grey in color.

- High alarm = Display in reverse contrast; Display alarm type "Hi"; Top and bottom LED's will flash 1/2 of a second intervals; alarm sound will be heard every 1/2 of a second interval; the vibrating motor will operate every 1/2 of a second intervals; for all alarms will repeat every 2 seconds; no muting is possible.

- HiHi/STEL alarm = Display in reverse contrast; Display alarm type "HiHi" or "STEL"; Top and bottom LED's will flash 2/10ths of a second intervals; alarm sound will be heard every 1/10th of a second interval; the vibrating motor will operate every 1/2 of a second intervals; for all alarms will repeat every 2 seconds; no muting is possible.

Alarms (continued)

In addition to the three levels of alarms that can be set for each gas there are optional alarms that can be enabled. By enabling these options the LOW level set point alarms may be able to be muted or disabled based on customer requirements. These optional alarm set up's are as follows:

- TWA Alarm = This is to alert the operator they are working in an environment that will cause them to stop working prior to the end of the 8 hour shift if the gas concentration does not decrease. The beeping will stop when the TWA average falls below the time/concentration threshold.

- STEL Alarm = This alarm is based on exceeding an average gas concentration of 15 minutes that is typically higher than the 8 hour TWA alarm but lower than that of an immediate hazard. The alarm is High in type and cannot be muted. Only exposure over time to a lower concentration will allow the alarm to discontinue.

As most of these instruments are for a specific person or crew it is not possible to reset the TWA clock until the work shift is over. To prevent the loss of TWA calculations by disabling or turning off the instrument a WORK SHIFT time is in the User Set Up menu. The default time is 8 hours. If the time is set to a longer work shift, the TWA calculations will continue as above but the total exposure calculation allowed for a workday (based on 8 hours per OSHA) will not change.

The P400 is capable of monitoring up 5 gases and as a result it is possible to have multiple alarms due to a multiple gas hazard.

Operation – Shut off

The Sensit P400 has an automatic shut off feature that is preset to 8 hours of continuous operation. At the end of 8 hours the instrument will beep for 10 seconds allowing the operator to select the CONTINUE ON feature by pressing any button. By not pressing a button the instrument will continue to turn off.

It is not possible to turn off the instrument during alarm conditions (this can be done through the password protected supervisor menu)

To manually turn off the instrument:

1. Push and continuously hold both the upper right and upper left button until the display reads:
    a. "Power off in"
    b. An automatic 4 second countdown time.
    c. "POWER OFF"

2. Release the buttons

Filter Replacement

1. Remove the 2 retaining screws from the front sensor cover.

2. Remove sensor cover to expose the foam filter.

3. Remove the foam filter. If lightly soiled, clean with warm water.

   Allow to dry. If the filter is heavily soiled or damaged, replace with a new filter.

4. Place the filter over the sensor area and replace the sensor cover. Secure with screws.

Bump Test - Calibration Check

To verify the proper operation and accuracy of the instrument it is necessary to perform a function test. This consists of using bottled or aerosol style gases with proper concentrations. Use of gas to test each sensor type is required.

EXAMPLE: An LEL (calibrated to CH4), CO, O2 and H2S version of the P400 will use a 2.5%vol CH4 (50%LEL), 100 ppm CO, 18.5% O2, 25 ppm H2S with balance nitrogen test gas. During the test the readings should be within 10% of the bottle contents when applied. If the instrument fails to test properly calibration or repair may be necessary.

Daily checks are recommended if any of the following conditions are encountered:

1. Infrequent use of the product
2. Gases such as those listed in the safety precautions are encountered
3. Dirty or harsh environmental use
4. Known hazards exist
5. When governmental or company requirements dictate such testing

The function test frequency is dependent on use and environment. If the instrument is in a gas free environment the test frequency may be extended. In no case should the testing of this product exceed 30 days.

Caution:

- Anytime it is suspected the instrument is not working properly perform a function test.
- Perform function tests in ambient temperatures of at least 45°F
- Perform all tests in an area known to be gas free

Performing Manual Check

1. Turn on instrument and wait until all sensors are zeroed and instrument is in the working display.
2. Attach the calibration cup to the front of the instrument.
3. Attach gas supply to the input of the calibration cup.
4. Allow the gas to flow up to 60 seconds.
5. Reading should be at least 90% of the test gas concentration and all alarms shall activate.
6. Remove and turn off gas supply.
7. Remove the gas, calibration cup and allow all sensors to clear.

Performing SCal 400 Automatic Check

1. Turn on instrument and wait until all sensors are zeroed and instrument is in the working display.
2. Place the instrument in the instrument cradle
3. Press and release the “Bump Test” button on the SCal 400 Station display.
4. When the display reads “PASS” SCal the test is complete.
5. Remove the instrument.
6. Allow all sensors to clear.

Calibration

Calibration is the process of adjusting sensor output to match known samples of test gas. This process should be done on a 30 day or monthly basis unless an effective bump test program is used to insure proper operation within the limits established. Other factors or conditions encountered as listed in the safety precautions would dictate a more frequent need to calibrate the instrument. If a bump test program is established, calibration is still required annually at minimum.

Performing Manual Calibration (AUTO CAL)

1. Turn on instrument and wait until all sensors are zeroed and instrument is in the working display.
2. Allow an additional warm up of 5 minutes.
3. From the USER MENU perform an AUTO ZERO
4. Attach calibration cup to the front of the instrument
5. From the USER MENU select AUTO CAL.
6. Attach gas supply to the calibration cup.
7. Turn on the gas. Wait for completion.
8. Follow onscreen prompts for next gases to apply.

9. Combination gases may be used where possible.
10. The display will show digital signal numbers for each gas it is testing.
11. "PASS" indicates a completed calibration.
12. Each sensor will automatically be calibrated if it is sensing the test gas.
13. Low sensor output is indicated by a FAIL message. Recalibration or repair is needed. The display will indicate failure. Press any button to continue.
14. Remove and turn off gas supply.
15. Remove the calibration cover from the instrument.
16. Allow 60 seconds for all sensors to clear.

Performing SCal 400 Automatic Calibration

1. Turn on instrument and wait until all sensors are zeroed and instrument is in the working display.
2. Allow an additional warm up of 5 minutes.
3. Prepare and ready SCal Station.
4. Place the instrument in the instrument cradle.
5. Press and release the “CALIBRATE” button on the SCal Station display.
6. When the SCal display reads “PASS” the test is complete.
7. Remove the instrument.
8. Allow all sensors to clear.

Using Manual Aspirated Sample Assembly

1. Attach assembly by tightening the thumb screw to the P400 sensor cover.
2. Check aspiratory assembly for proper flow block.
3. Aspirate 3 times, plus 1 time for every 3 foot of tubing. Be sure to fully collapse aspirator during sampling.
4. Remove assembly when completed.

Using P400 motorized pump

1. Turn on instrument until all sensors are zeroed and instrument is in the working display.
2. Attach the pump to the front of the instrument. Secure by tightening the thumbscrew to the front grill of the P400. Only finger tight.
3. The contacts on the front of the instrument will engage the pins on the pump allowing it to activate.
4. Properly attached pump is momentarily indicated by displaying "PUMP STARTING" followed by a 4 second countdown.
5. Properly functioning pump is indicated by a **P** on the top line of the display.
6. Perform a flow block by blocking the inlet of the sample assembly.
7. Alarms will activate and the display will flash **P!** in the icon bar and display FLOW BLOCK indicating flow block.
8. Release and flow block message will cease.
9. When the pump is detached the display will show "PUMP DISABLED" and alarms will activate. Press the upper right button to acknowledge or properly reattach the pump.

Menu

User Menu is designed to enhance the operation of the Sensit P400. There are limited selections for a field user. These are divided among control types of historical data review/download and entry fields. History items can be reviewed only. Entry fields allow an action to be performed.

Entry fields

Auto Cal: Begins the calibration process.

Bump Test: Allows a timed test to confirm proper sensor functionality when applying the test gases.

Set Time: Provides access to the clock function to change time

Set Date: Provides access to set the date. ddMONyyyy format

Auto Zero: Perform a manual zeroing of all sensors (Perform in fresh air only)

Peak Hold: Perform remote gas testing such that all peak readings remain on display

Supervisor: Allows supervisor to enter password and set operational parameters such as alarm values.

History fields

Cal Log: Allows the user to view the last 10 calibration logs. (10 Max. Entries)

Bump Test Log: Displays last 93 bump test for each sensor including date/time. (93 Max. Entries)

Data Log: Allows a review of all records in the on-board memory based on the preset data logging time period. (10752 Max. Entries)

Event Log: Displays all gas alarm events during the operational sessions. (120 Max. Entries)

Peak Hold Log: Displays all peak reading operational sessions. (102 Max. Entries)

Snapshots: Displays all manually saved screen information. (102 Max. Entries)

Settings: Show settings of supervisor selected options.

Menu (continued)

In the Supervisor area of the User Menu, you will find user features that have been enabled.

NOTE: Not all features may display based on user order.

1. AUTO OFF TIME - This item sets the amount of time in hours a unit will turn off after being left idle. (1-12 hours; default = DISABLED)

2. POWER OFF - Power the unit off even in alarm.

3. LOG INTERVAL - Sets automatic data logging interval. (1 second - 1 hour; default = DISABLED)

4. SETUP ALARMS
    a. ENABLE TWA - Enables TWA alarms.
    b. ENABLE STEL - Enable STEL alarms.
    c. SHIFT LENGTH - Set shift length. (1-12 hours; default = 8)
    d. ENABLE LATCH - Enables alarm latching
    e. SNOOZE LENGTH- Sets the amount of time an alarm can be silenced. (1 minute - 10 minutes; default = DISABLED)
    f. Various gas alarms (options change depending on the sensors configured). 1. Allows alarm points to be set for LOW, HI, HI HI, STEL, and TWA for each gas where applicable.

5. SET UP TICK - Allows the unit to be set up for IDS, if so equipped, on the various gases. (default = DISABLED for all gases)

6. BEEP INTERVAL - Set up confidence beep interval. (10-60 seconds; default = DISABLED)

7. CAL INTERVAL - Set up calibration interval. (1-365 days; default = DISABLED)

8. CAL DUE ACK - Enables cal due acknowledge (default = DISABLED)

9. ZERO FAIL ACKNOWLEDGE - Enables zero fail acknowledge. (default = DISABLED)

10. BUMP INTERVAL - Set up bump required interval. (1-30 days; default = DISABLED)

Menu (continued)

11. EX GAS TYPE - Set calibaration gas type for combustible gas sensor.
    (default = CH4, options are PRO, PEN)

12. SHOW EX TYPE – Default = YES

13. EX GAS UNITS - Set PPM display of EX gas.

14. H2S Decimal – Default = NO

15. LEL RESOLUTION - Set LEL resolution.

16. O2 CAL - Enable

17. SET NAME - Allows user to set name for unit that will appear in startup.
    (default = blank)

18. CLEAR LOGS - Clears all logs except automatic data log.

19. CLEAR DATA LOG - Clears automatic data log.

20. SET PASSWORD - Allows user to change supervisor menu password.

21. ACTIVATE PEAK HOLD MODE - Allow Peak Hold Mode to display in user menu

Warranty

Your Sensit P400 is warranted to be free from defects in materials and workmanship for a period of two years after purchase (excluding calibration and batteries). The circuit board is warranted for 5 years. 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.

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