mPower Electronics
Making Powerful Senses

NEO BENZ

Benzene & Butadiene Selective Measurements
Quick Start Guide

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PN: M011-4016-000 v1.4

WARNINGS

Read Before Operating

The NEO BENZ's User's Guide must be carefully read by all individuals who have or will have the responsibility of using, maintaining or servicing this product. The product will perform as designed only if it is used, maintained and serviced in accordance with the manufacturer's instructions.

Warning!

- **Change battery only in an area known to be non-hazardous.**
- **Use only mPower's battery pack PN: M011-3002-000.**

Avertissement!

- **Changez la batterie uniquement dans une zone connue pour être non dangereuse.**
- **Utiliser uniquement la batterie mPower PN: M011-3002-000.**

Warning

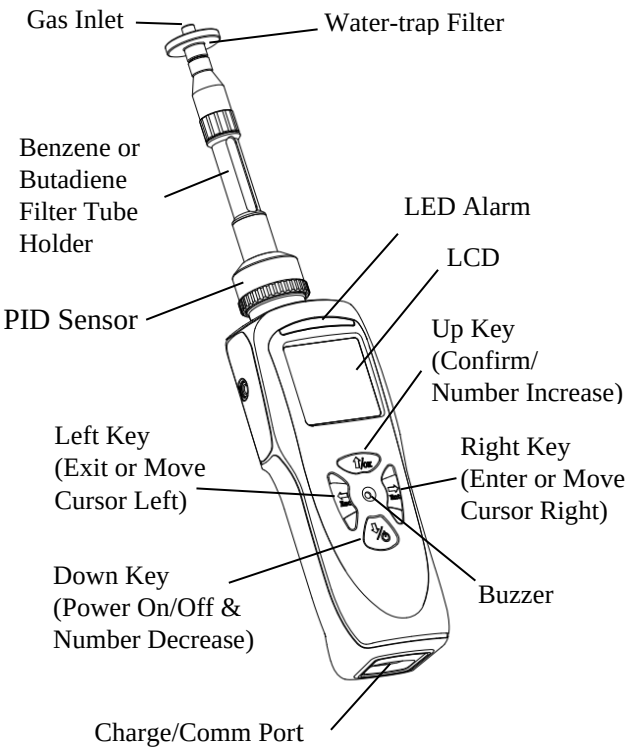
- Never operate the monitor when the cover is removed.
- Remove the monitor cover only in area known to be non-hazardous.
- Use only mPower's sensor and accessories. Substitution of components will impair suitability for intrinsic safety and void warranty.
- It is recommended to bump test with a known concentration gas to confirm the unit is functioning properly before use.
- For maximum safety, the accuracy of the instrument should be checked by exposing it to a known concentration calibration gas before each day's use.
- Ensure that the gas inlet is not blocked.
- When replacing batteries, dispose of old ones properly.
- For optimal test results, it is recommended to allow the unit 2 minutes to warm up before taking measurements
- Ensure that the water-trap filter is clean & replaced regularly.
- Do not operate with a benzene filter tube in the holder for more than 15 min. or corrosive liquids may be drawn in and damage the unit.
- Remove the sensor only for service. Zero and span calibration is required once the sensor is moved.
- Before use, ensure that the colorless ESD layer on the display is not damaged or peeling. (The blue protective film may be removed.)

Avertissement

- N'utilisez jamais le moniteur lorsque le couvercle est enlevé.
- Retirer le couvercle du moniteur et la batterie uniquement dans une zone connue comme non dangereuse.
- La substitution de composants compromettra l'aptitude à la sécurité intrinsèque et annulera la garantie.
- Il est recommandé de tester avec un gaz de concentration co nnu pour confirmer que l'instrument fonctionne correctemen t avant de l'utiliser.
- Avant l'utilisation, assurez-vous que la couche ESD incolore de l'écran n'est pas endommagée ou épluchée. (Le film protecteur bleu peut être enlevé.)

User Interface

The user interface has four-key operation, one big LCD with LED backlight, four red alarm LEDs, and one buzzer.



Turning the Unit On

Press the Down Key for 3 seconds, until the buzzer beeps and the red LED flashes. After a warm up and self-test sequence, the unit enters VOC reading mode, showing real-time gas concentrations.

Turning the Unit Off

In normal reading mode, press and hold the Down Key for a 5-second count down, until "Unit Off" is displayed.

Charging

Always fully charge the battery before use. Plug the charger to the bottom of NEO BENZ. The battery icon shows the charge status and cycles from empty to full during charging.

Charging/Comm Cable

The USB Charging/Communications cable allows charging the unit on a personal computer. A locally-purchased cable can work as well for charging, but mPower's cable must be used for proper data transfer when communicating with mPower Suite.

Water-trap Filter

Water-trap filters (P/N: M490-0004-010) are used to protect the sensor from dust and aerosols in dirty environments. The filter should be twisted on to the gas inlet before the instrument is used and replaced once its surface is dirty.

Testing the Alarms

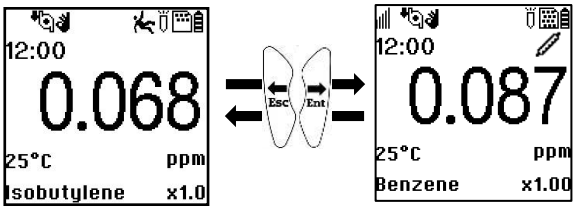
Important! Test the alarms prior to performing a bump or span calibration test. If any alarm does not respond, check the Alarm Settings in Config Mode to make sure all alarms are enabled (Config Mode → Alm Setting → Alarm Settings → Both Enabled). If any alarms are enabled but are not functional, do not use the instrument.

Under normal operation mode and non-alarm conditions, the buzzer, LED and backlight can be tested anytime by pressing the Right Key once.

Detection Modes

The NEO BENZ has two measurement modes:

1. VOC Mode – Typically uses isobutylene calibration and any measurement gas
2. Tube (Benzene) Mode – Benzene calibration only
   a. Continuous Benzene Screening (No tube)
   b. Benzene-specific Tube Measurement

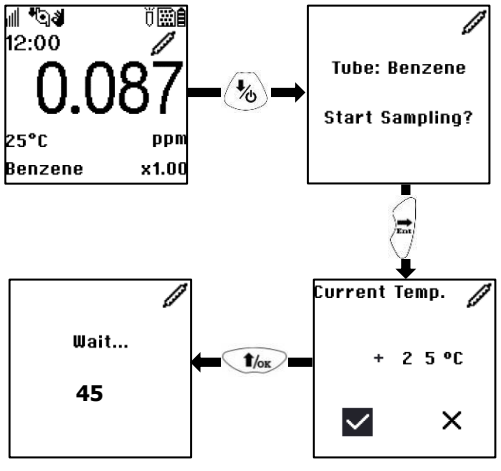


VOC Mode Benzene Mode

To switch between these main Modes, press the Left and Right Keys simultaneously for 2 sec.

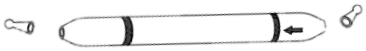
Benzene Measurements

1. Calibrate in Benzene Mode with 5 ppm benzene.
2. Use Continuous Benzene Screening Mode to monitor for benzene without a filtering tube.
3. If a reading above the alarm limit is found, take a single-point benzene measurement using a tube:
4. From Benzene Screening Mode, press Down.
5. When asked to start sampling, press the Right key.
6. Enter the temperature using the Up & Down keys to increase or decrease and the Right & Left keys to move the cursor. Move to √ and press Up.

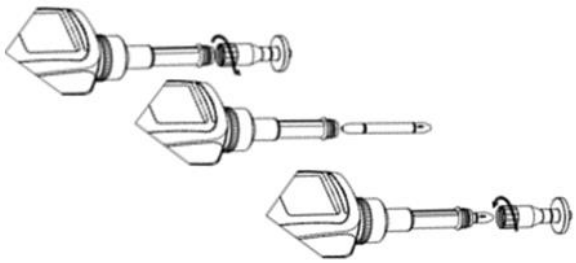


Benzene Measurements (Continued)

7. When prompted to insert a tube, open both ends of a tube using the tube tip breaker, taking caution to protect eyes and hands from sharp glass pieces.



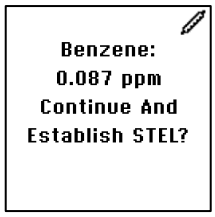
8. Unscrew the top section of the tube holder, insert the tube with the arrow pointing towards the instrument, and screw the top section back on.



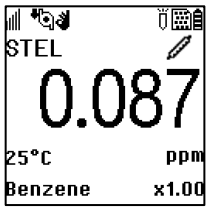
9. Briefly hold a finger on the probe tip to ensure flow is blocked to check for a good seal on the tube.
10. Direct the probe to the sampling point and press the Up key to start a count-down timer. The sampling time is 45 s at room temperature, but ranges from 30 s to 360 s depending on temp.
11. Press Left at any time to abort.

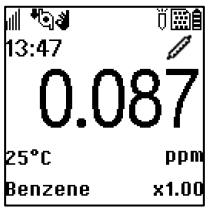
STEL Measurement

At the end of the sampling time, the screen shows the concentration of the current benzene test and asks whether to continue on to a STEL measurement (using the same tube).



Press Left to escape back to Continuous Benzene Screening or Right to continue with STEL sampling for a 15-minute countdown, shown in the upper left corner ("STEL" alternating with remaining time)





⚠CAUTION!

After a STEL Measurement remove the tube to avoid corrosive liquids from the tube being drawn into the monitor. Use a new tube for the next measurement.

Enter/Exit Configuration Mode

In Config Mode, the user can perform calibrations, change the alarm limits and set up other parameters.

Press and hold the Up and Down Keys together for 3 seconds, to enter Config Mode.

- The Config Mode is password protected with default password of "0000".
- Enter all four digits, move the cursor to √ and press the Up Key to enter Config Mode.
- Press the Left Key to exit Config Mode.

Configuration Mode Menus

In general press Right to select a menu or item, Left to exit, and Up & Down to scroll lists. To enter numbers, use Up or Down to increase or decrease and Left or Right to move the cursor. Use Up to accept.

- **Calibration**: Zero Cal., Span Cal., Set Cal.Gas, Set Span Value, Set Span 2 Value, 3-Point Cal.
- **Meas.**: Measurement Unit, Measurement Gas
- **Alm Setting**: Alarm Limits, Alarm Mode, Alarm Settings, Comfort Beep, Man Down Alarm
- **Datalog**: Clear Datalog, Set Interval
- **Mnt (Monitor) Setup**: Date & Time, Display, Pump Speed & Stall, Rolling Graph, Real Time Data, Language, Temp. Unit, Tube Type
- **Wireless**: Radio On/Off

Calibration

Separate Zero and Span Calibrations must be done in VOC and Benzene Modes, for a total of four Cals. For benzene calibration, both Zero and Span must be done using a tube, and preferably at the same temperature as the measurements. The same tube can be used for zero followed by span, and for the first measurement if the tube is purged for 2 minutes in clean air after span calibration.

Zero Calibration

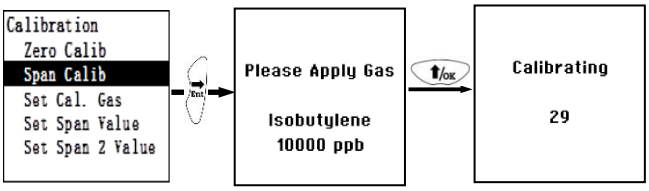
Zero calibration sets the baseline for the sensor and is done in fresh air or other clean air source.

- To enter fresh air calibration:
- Config Mode → Calibration → Zero Calib.
- To start fresh air calibration:
  Press the Right Key and a count-down timer starts. When the count-down is finished, "Pass" or "Fail" will be displayed. To abort the zero calibration use the Left Key during count down.

Span Calibration

Span calibration defines the response of the sensor to the gas. It is done with a known concentration gas.

- Benzene cal. must use a demand-flow regulator or gas bag and cannot use a fixed-flow regulator.
- To enter span calibration:
- Config Mode → Calibration → Span Calib
- To start span calibration:
  Apply Gas → Start Calibration → Wait Count-down Finish → Get Result.



Gas Selection

In Benzene Mode, span calibration must be done with benzene, preferably at about 5 ppm.

In VOC Mode, span calibration is usually done with isobutylene, but may use any gas. To correct the response to be accurate for another measurement gas:

Config Mode → Measure → Gas Library

Scroll the gas list and select the desired gas, then press Left to save and exit.

Addendum for Butadiene

Butadiene measurements follow essentially the same procedures as for benzene, except as follows:

- In Configuration Mode, select Butadiene Tubes: Config Mode → Monitor Setup → Tube Type → Butadiene
- Calibrate the butadiene channel with a fresh air zero and 5 ppm butadiene span gas, using a new butadiene tube and at the temperature of expected measurements. The same tube can be used for zero and span calibration.
- If using all three channels, VOC, benzene and butadiene, a total of 6 calibrations are required (3 zeroings and 3 span calibrations).
- Butadiene measurements take longer than benzene, typically 3 minutes at room temperature, and range from 2 to 6 minutes, and are not suitable for below freezing temperatures.
- Butadiene measurements are not affected by styrene, acrylonitrile, TCE, PCE and most components of gasoline. Propylene, butenes and vinyl chloride may interfere, if present.
- Butadiene tubes contain no toxic or corrosive chemicals and are not considered hazardous waste. They can be left in the tube holder for long periods without causing damage.