



Version: 202601EN

# **User Manual of Nutech 3000 Portable Analyzer for THC & NMHC**

Nutech Instruments, Inc

[www.nutechinst.com](http://www.nutechinst.com)

## Notice

Thanks for choosing our products. Please read this manual carefully before using the product.

### **Safety precautions for instrument use**

- Use only the supplied high-temperature power cable.
- Verify that the electrical parameters of the power outlet and the circuit breaker meet the requirements of the instrument.
- If the instrument is not used for a long time, all power supplies to the instrument must be disconnected.
- Before using the instrument, you must remove the foam and other items filled inside it and take off the instrument cover cloth. It is strictly forbidden to place flammable and explosive items near the instrument, and it is strictly forbidden to place containers with liquid on top of this instrument.
- It is strictly prohibited to cover the instrument with a cover cloth before it cools down to room temperature.
- The instrument must be reliably grounded.
- It is strictly forbidden to disassemble the sensor analysis box.
- It is strictly forbidden to repair or disassemble the instrument under charged condition.

To ensure the stable and reliable operation of the instrument, the user must use the original accessories and consumables provided by Nutech. Nutech will not provide service, warranty or be accountable for profit loss for problems caused by using non-original accessories and consumables.

Nutech is not responsible for any malfunction or damage caused to our instruments if the user is not using our auxiliary instruments and equipment. We are not responsible for any damage or loss caused by abuse, negligence or misuse. The user assumes all risks for the above cases.

Due to the product update, Nutech may modify the manual according to the current status of the product, and these modifications will be reflected in the new version of the document without prior notice.

The copyright of this manual belongs to Nutech, and no organization or individual may reproduce, copy, delete or unlawfully transmit all or any part of this manual in any way without our permission and authorization.

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## Safety Precautions

Before operating the instrument, please read the instructions carefully and follow the safe operation norms.

Please keep the instructions carefully for future reference.

Please ensure that only personnel with relevant training can operate and use this instrument.

Please abide by relevant regulations such as safety regulations.

### Safety Symbols

---

#### **DANGER**

The information identified by this symbol is essential to the health and safety of the operator. Actions that violate this symbol may cause harm to your health or personal safety.

#### **WARNING**

The information identified by this symbol is very important to ensure the normal operation of the instrument. Operators who violate this symbol may cause damage to the instrument.

#### **CAUTION**

The information identified by this symbol is very important to ensure the effective operation and use of the instrument. Operators who violate this symbol may cause inaccurate results.

### Electricity Safety

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Make sure that the power supply socket and the power cable plug of the instrument match each other.

#### **WARNING**

Check the voltage of the power supply socket and confirm that the power supply voltage or charger meets the instrument requirements.

#### **DANGER**

In order to avoid the risk of electric shock and damage to the instrument, disconnect the power supply before disassembling the instrument. It is forbidden to disassemble or plug the internal cable plug of the instrument while it is live. Without professional guidance, non-professional is not recommended to disassemble the instrument.

### Gas Safety

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#### **DANGER**

Gas cylinders must be handled, stored and used in accordance with the relevant safety regulations.

- The marking of the gas cylinder should be clear.
- Cylinders should be stored in a well-ventilated area, away from heat sources, and should be securely fastened to ensure safety.
- Gas cylinders, single-stage pressure regulators, gas pipelines and joints must not leak.

#### Avoid Burns

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#### **DANGER**

The instrument heating area and high temperature parts (such as sampling line, etc.) are hot during operation and for a certain period of time after power cut-off, so direct contact is prohibited to avoid burns.

## Warranty and Liability

According to the Nutech's warranty, this instrument is guaranteed for 1 year. If there are any problems during the warranty period, please contact your supplier.

The warranty does not cover natural wear and tear of parts and does not apply to damage caused by negligence, improper handling or failure to use and maintain the product in accordance with the operating instructions.

Please read these instructions carefully. Nutech is only responsible for the safety, reliability and performance of the instrument under the following conditions:

- Operate in strict accordance with the instruction
- Only our authorized personnel will perform maintenance on the instrument.
- Use only original parts and accessories for repairs

The Nutech 3000 can only be opened by authorized maintenance facility or customer service center personnel. If maintenance is required, please contact Nutech's Customer Service Department. In addition, please comply with the safety regulations and accident prevention guidelines for the operation of the instrument. Nutech cannot be held responsible for damage caused by accident, improper use or illegal modifications or maintenance.

## General Introduction

The Nutech 3000 is an instrument for portable monitoring of total hydrocarbons, methane and non-methane hydrocarbons in stationary emission sources, fence line ect.

Before operating the instrument, first check whether the filter element in front of the heated sampling line handle needs to be replaced, in order to prevent particulate matter or highly sticky substances from entering the instrument and contaminating the internal tubing. Use a wrench to connect the supplied sampling extension tube to the heated sampling line handle, then connect the complete sampling assembly to the instrument inlet.

Place the H<sub>2</sub> cartridge in the designated chamber and connect the outlet tubing to the instrument H<sub>2</sub> inlet. Open the cartridge valve to supply H<sub>2</sub> to instrument.

Power on the instrument and the tablet sequentially, then log in to the operating software. When a green “Connected” status appears at the bottom of the main interface, the instrument enters the preheating state. The heated sampling line, catalytic furnace, and FID begin heating according to the preset temperatures. When the temperatures approach the target values, the pump and valves are activated to supply gas. The instrument ignites and remains in standby/idle mode. After preheating for more than 20 minutes, zero calibration and sample measurement can be performed.

## Introduction of Instrument Parts

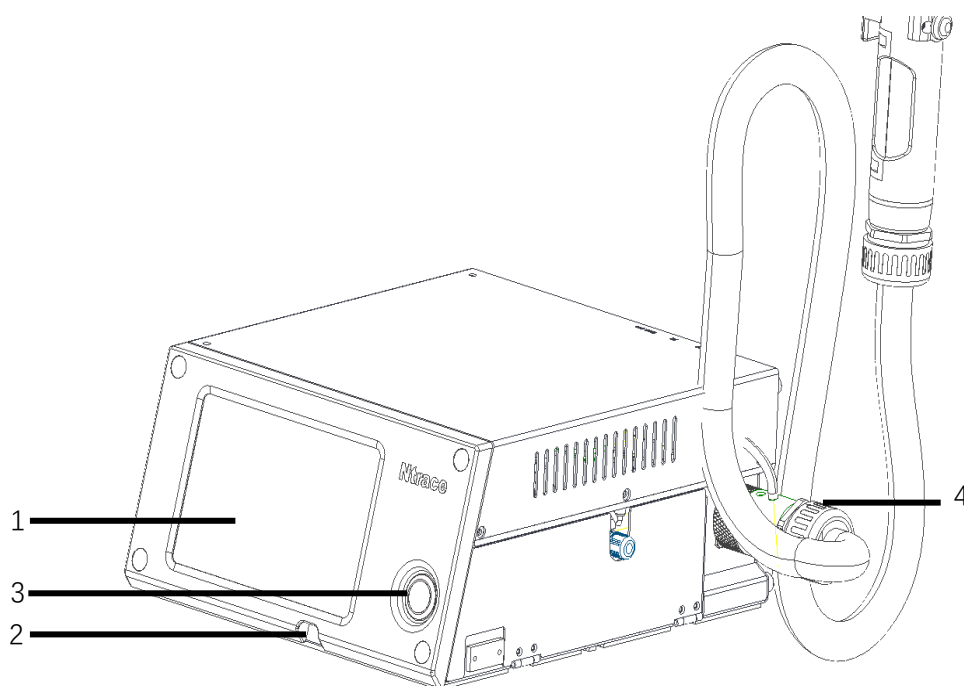


*Figure 1 Front View*

1. Control Tablet   2. Tablet Buttons   3. Power Switch   4. Heated Sampling Line

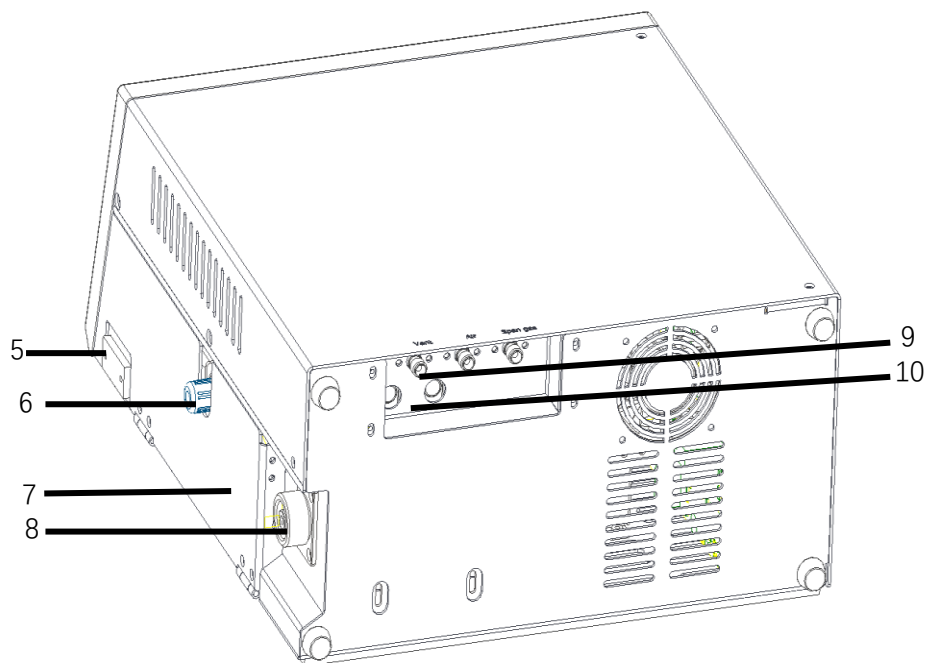


*Figure 2 Back View*

5. Power Input   6. Sampling Line Power Connector   7. Magnetic Cover  
8. Sample Gas Inlet   9. Gas Ports: VENT, AIR, SPAN   10. FID Exhaust Outlet

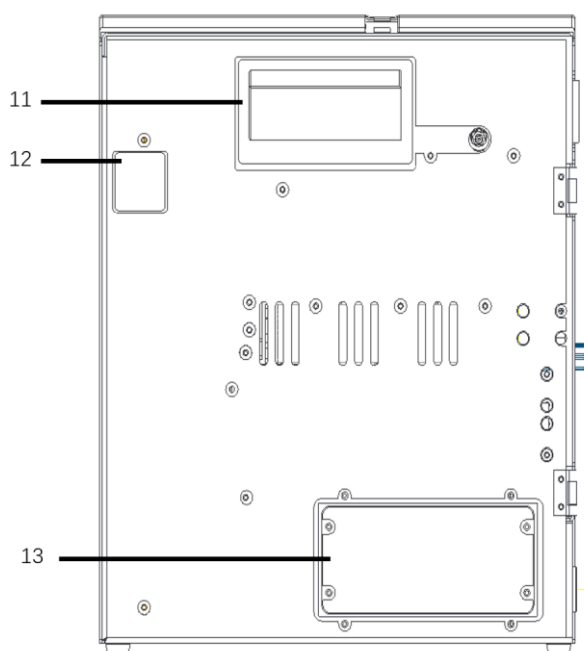


*Figure 3 Bottom View*

11. Handle   12. Ethernet Port   13. Insulation Enclosure Service Panel

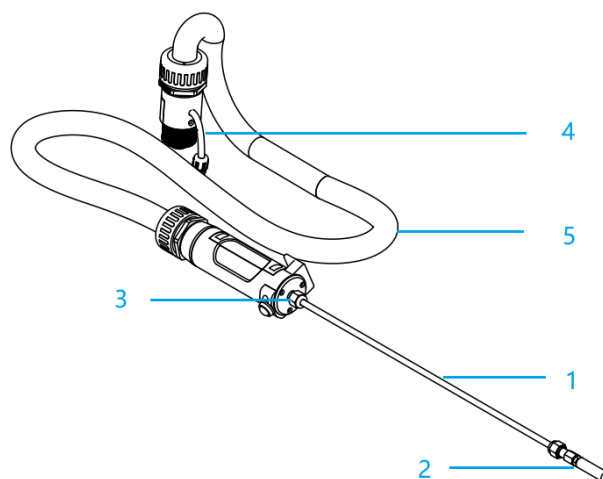


*Figure 4 Sampling Line Assembly*

1. Extension Tube    2. Filter Tip    3. Extension Tube Connector  
4. Sampling Line Power Connector    5. Heated Sampling Line

## Installation & Assembling

### Sampling Line Connection

---

As shown in Figure 4, the fully assembled sampling line is illustrated. The detailed installation steps are as follows:

1. First, check whether the filter element at the handle and the filter tip at the front end of the extension tube need to be replaced, in order to prevent particulate matter or highly sticky substances from entering the instrument and contaminating the internal tubing. Record the service life of the filtration components. The filter element should be replaced once per week, and the filter should be replaced once per month. Under high-temperature, high-humidity, and high total hydrocarbon conditions (>10,000 ppm), the replacement frequency should be doubled.
2. Connect the extension tube to the handle of the heated sampling line.
3. Connect the sampling line connector to the sample inlet of the analyzer and hand-tighten securely.

### H<sub>2</sub> & Air Connection

---

Using the supplied 10 cm PTFE tubing, connect one end to the H<sub>2</sub> cartridge and the other end to the instrument H<sub>2</sub> inlet.

Using the other supplied 10 cm PTFE tubing, connect the Silica Gel Dryer Tube to the filtered air inlet.

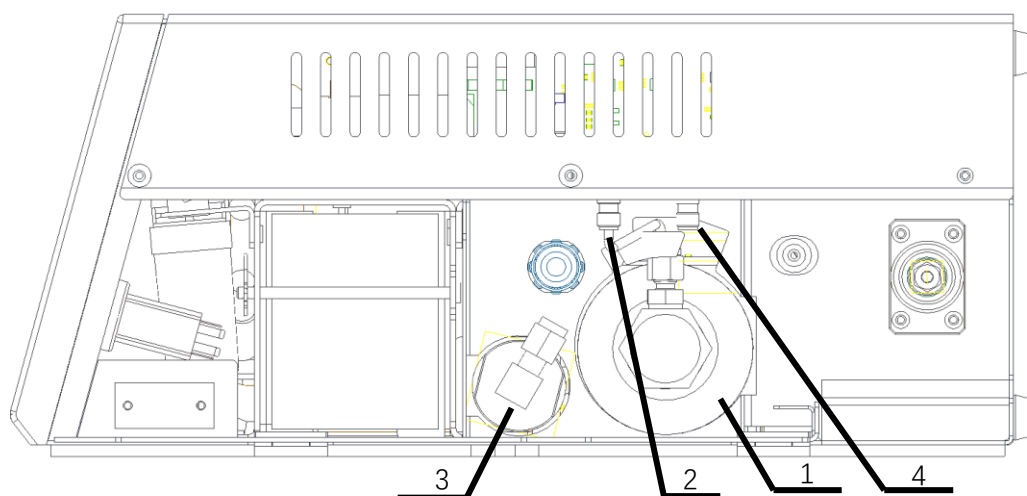


*Figure 5 H<sub>2</sub> & Air Connection*

1. H<sub>2</sub> Cartridge Compartment   2. H<sub>2</sub> Inlet   3. Air Purification Tube   4. Filtered Air Inlet

## Software Introduction

### 1. Main Interface

#### Bluetooth Connection

The instrument has a control tablet on front panel and the communication between the instrument and the tablet is by Bluetooth. Normally the Bluetooth connection will be done automatically. If not, tap the drop-down menu next to the **Bluetooth** icon at the top of the screen. The available Bluetooth device names will be displayed at the bottom of the interface. Scroll to select the target device name (normally serial number) and tap **OK** to complete the Bluetooth connection.

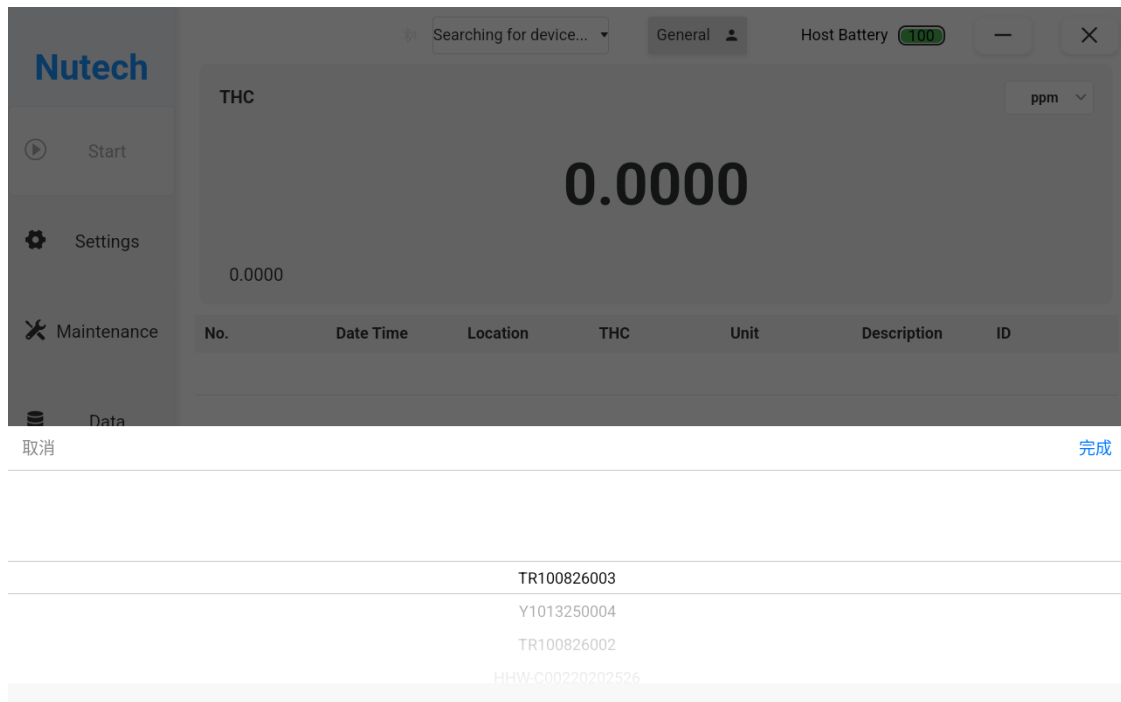


Figure 6 Bluetooth Connection

## 2. Home Interface

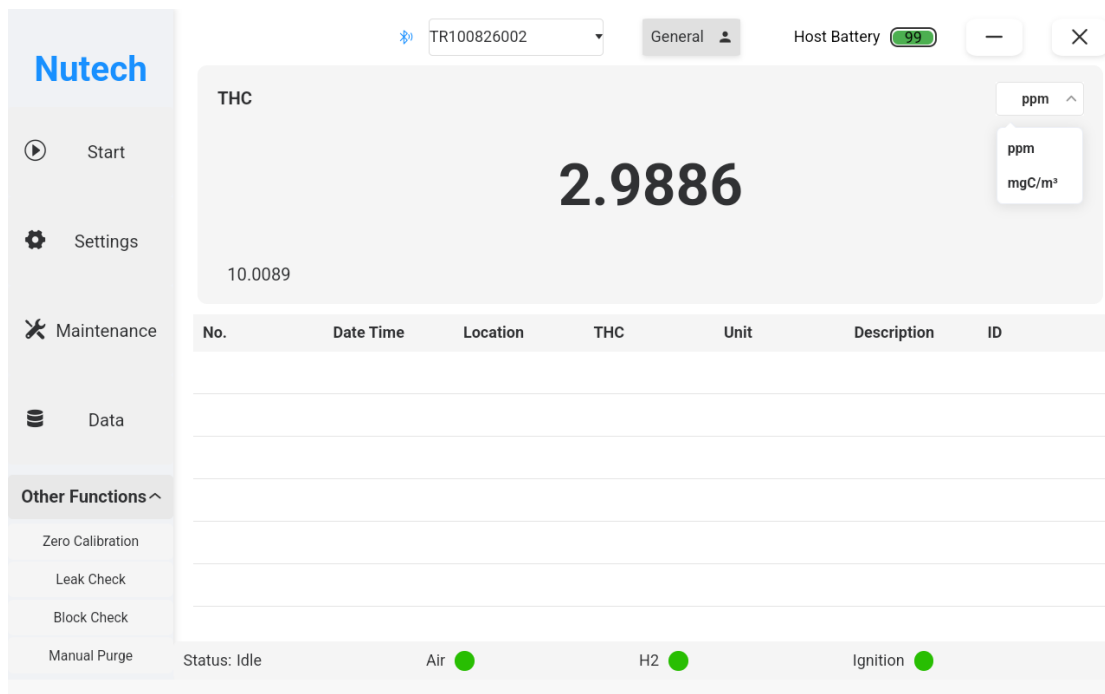


Figure 7 Control Software Home Interface

### Main Menu

Introduction of the main menu:

Press **Start** or **Stop** button to start or end the test.

Press **Settings** button to check and set the parameters.

Press **Maintenance** to check instrument status.

Press **Data** to process the test data.

Press **Zero Calibration** to calibrate the baseline of the instrument.

Press **Leak Check** to check the air tightness of the instrument.

Press **Block Check** to check whether there is block in gas path.

Press **Manual Purge** to manually purge the instrument.

## **Status**

**Preheating:** The instrument automatically enters the preheating state after power-on. A percentage progress indicator is displayed during the preheating process.

**Idle:** The instrument components are within the specified ready-state parameters and are ready to perform a test upon command.

**Sampling:** The instrument has received a test command and is performing a sample measurement, with the test data being recorded.

**Manual Control:** Under manual purge status or other manual control status

## **Indicator**

When the Air / H<sub>2</sub> pressure meets the setting, the indicator turns green. The indicator is gray if pressure is not met. When FID ignition is successful, the Ignition indicator turns green. The indicator turns gray if the ignition fails.

## **Battery**

The instrument's battery level is displayed as a percentage. Users can monitor the remaining battery capacity and recharge the instrument in a timely manner as needed.

## **Unit**

Can be switched between ppm or mgC/m<sup>3</sup>

### 3. Setting Interface

#### 3.1 Parameter Settings

Settings

<

Parameter Settings

Gas Selection

Other

Baseline

FID1(THC): 6.9788

pA Value: 10.0043

Auto Zero

Manual Zero

Mode

Multiple

Continuous

Average

Run Count

7

Interval(s)

20

O<sub>2</sub> Correction

O<sub>2</sub> Conc.(%)

0

Coefficient

1.1

Humidity Correction

Humidity (%)

0

Set

Figure 8 Settings Interface

#### Baseline

It allows users to observe the baseline line of the FID and perform zero calibration. Press **Auto Zero** to use the current baseline as zero point. For Manual Zero, enter a specific value and then press Manual Zero.

#### Mode

**Multiple:** The instrument performs tests and records data according to the preset time interval and number of runs. After the specified number of runs is completed, the instrument automatically stops testing.

**Continuous:** The instrument performs tests continuously at the preset time interval.

**Average:** Specifies whether the recorded test result is the instantaneous measured value or the average value over the defined time interval.

## Oxygen Correction

Under normal conditions, the FID response is affected by the oxygen content in the sample gas. This function is provided to compensate for the influence of oxygen. When enabled, oxygen concentration correction is applied. The oxygen concentration value can be entered manually.

## Humidity Correction

When this function is enabled and enter the humidity, the instrument outputs result on a dry basis.

### 3.2 Gas Selection

When **Pump Sampling** is selected, the instrument automatically draws ambient air as the combustion gas for ignition. When **Cylinder Gas** is selected, zero air or dry air must be supplied to the Air inlet of the instrument as the combustion gas. The Air inlet is located on the rear panel of the instrument.

When Sample Inlet is selected, the span calibration can be done via the sample line inlet. When Span is selected, the span calibration can be done via the Span Gas inlet.

The screenshot shows the 'Settings' menu with a dark blue header. Below the header, there are three tabs: 'Parameter Settings', 'Gas Selection' (which is active and highlighted with a blue underline), and 'Other'. The 'Gas Selection' tab contains three sections: 'Air', 'Sample|Span', and 'Description'. In the 'Air' section, 'Pump Sampling' is selected with a blue checkmark, and 'Cylinder Gas' is unselected. In the 'Sample|Span' section, 'Sample Inlet' is selected with a blue checkmark, and 'Span Inlet' is unselected. In the 'Description' section, 'Sample' is selected with a blue checkmark, and 'Standard' is unselected. A 'Set' button is located at the bottom right of the 'Gas Selection' tab.

*Figure 9 Gas Selection Interface*

## Sample | Span

Select whether to use sampling line inlet or Span Gas inlet to do the span calibration.

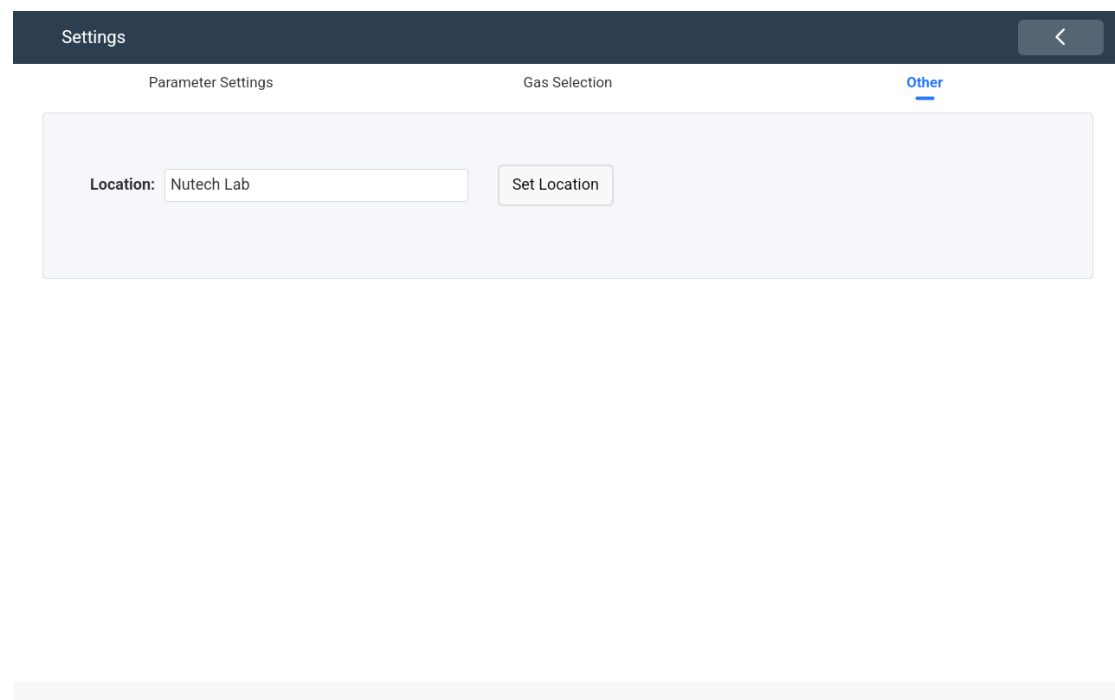
## Description

User can select between Sample or standard. For example, when user want to do a drift correction, Standard can be selected to indicate that the test data is only for calibration, not for real sample.

### 3.3 Other

---

In this interface, customer can set the location of the measurement. The location will be displayed as part of test data at home interface.



The screenshot shows a mobile application interface for settings. At the top, a dark blue header bar contains the word 'Settings' on the left and a back arrow icon on the right. Below the header, there are three tabs: 'Parameter Settings', 'Gas Selection', and 'Other'. The 'Other' tab is currently selected, indicated by a blue underline. The main content area is a light blue rectangle containing a 'Location' label, a text input field with the value 'Nutech Lab', and a 'Set Location' button.

*Figure 10 Location Setting*

## 4. Maintenance Interface

### 4.1 Flow & Pressure

---

The first section displays the set flow rate and real-time flow rate of Air, H2 and sample. The second section displays the pressure of flow path and its coefficient. The third section displays the air pump and sample pump status.

It's only for checking status. Users are not allowed to change the setting.

Maintenance
<

Flow & Pressure
Temperature
System
Other

Flow Rate(mL/min)

|     |     |        |    |    |       |        |    |       |
|-----|-----|--------|----|----|-------|--------|----|-------|
| Air | 190 | 189.50 | H2 | 27 | 26.91 | Sample | 12 | 11.80 |
|-----|-----|--------|----|----|-------|--------|----|-------|

Coefficient/Pressure (psi)

|     |      |      |    |      |      |        |     |      |
|-----|------|------|----|------|------|--------|-----|------|
| Air | 1.44 | 6.00 | H2 | 1.15 | 2.60 | Sample | 0.5 | 5.97 |
|-----|------|------|----|------|------|--------|-----|------|

Pumps & Valves
☐

Air Pump
☒
Sample Pump
☐

Set

Figure 11 Flow & Pressure

## 4.2 Temperature

The temperature can be observed in this interface. Users are not recommended to change the setting.

Maintenance
<

Flow & Pressure
Temperature
System
Other

Temperature (°C)

|                    |     |     |                     |     |     |
|--------------------|-----|-----|---------------------|-----|-----|
| Oven               | 190 | 190 | Catalytic Converter | 230 | 229 |
| Heated Sample Line | 120 | 119 | Instrument          | 31  |     |

Set

Figure 12 Preset Temperature & Real-time Temperature

## 4.2 System

---

The instrument's version information is displayed in this interface.

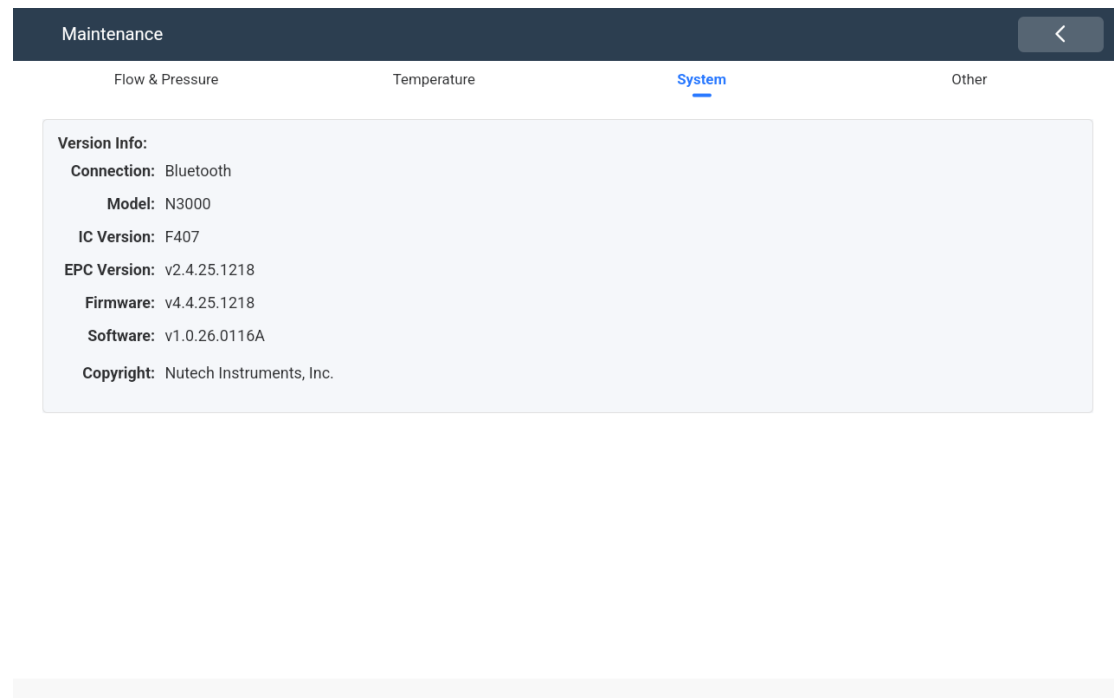


*Figure 13 System Interface*

## 4.3 Others Interface

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**Decimal Places:** 0–4 digits can be entered. Click **Save** to confirm. It determines how many decimal places the test data will display.

**Storage Delay:** After clicking **Start**, data will only be stored in history after the specified delay time. This can help to automatically skip the initial a few minutes data which is normally less stable. This function is not enabled by default.

**Save Duration:** In the real-time curve interface, the curve is saved for the most recent 2 hours by default.

**Total Operating Time:** Records the cumulative running time of the instrument.

Maintenance

Flow & Pressure

Temperature

System

Other

Config File:

Export Config

Import Config

Storage Delay:

☐

Delay (min):

2

Submit

Display:

Decimal Places:

–

4

+

Save

Save Duration:

Real-time Curve(h):

–

2

+

Submit

Operating Time:

Total Operating Time(h):

28.78

Figure 14 Other Interface

## 5. Data Interface

Press **Query** button and then select the start time and end time and then click OK.

Data

Query

Export

Import

Print

Delete

Selected:0rows

2026-01-16 00:00:00 to 2026-01-16 23:59:59

Records: 88

|                          | No.   | Date Time           | Location | THC      | Unit | Description | ID                   |
|--------------------------|-------|---------------------|----------|----------|------|-------------|----------------------|
| <input type="checkbox"/> | 53336 | 2026-01-16 08:45:18 |          | 3.6161   | ppm  | Standard    | NO.20260116084518183 |
| <input type="checkbox"/> | 53337 | 2026-01-16 08:45:38 |          | 103.0282 | ppm  | Standard    | NO.20260116084538309 |
| <input type="checkbox"/> | 53338 | 2026-01-16 08:45:58 |          | 155.4304 | ppm  | Standard    | NO.20260116084558308 |
| <input type="checkbox"/> | 53339 | 2026-01-16 08:46:18 |          | 150.1943 | ppm  | Standard    | NO.20260116084618306 |
| <input type="checkbox"/> | 53340 | 2026-01-16 08:46:38 |          | 143.703  | ppm  | Standard    | NO.20260116084638311 |
| <input type="checkbox"/> | 53341 | 2026-01-16 08:46:58 |          | 138.5741 | ppm  | Standard    | NO.20260116084658309 |
| <input type="checkbox"/> | 53342 | 2026-01-16 08:47:18 |          | 134.0998 | ppm  | Standard    | NO.20260116084718310 |
| <input type="checkbox"/> | 53343 | 2026-01-16 08:47:38 |          | 130.822  | ppm  | Standard    | NO.20260116084738306 |
| <input type="checkbox"/> | 53344 | 2026-01-16 08:47:58 |          | 127.4165 | ppm  | Standard    | NO.20260116084758311 |
| <input type="checkbox"/> | 53345 | 2026-01-16 08:48:18 |          | 125.5449 | ppm  | Standard    | NO.20260116084818310 |

First

Previous

Next

Last

Rows per Page:

12

Current:

1

Go

Total: 8

Figure 15 Data Interface

Press **Export** button to export all the queried data to other devices like user's computer. The data transfer can be done by WiFi or Bluetooth. The export data is stored in the Download directory of the tablet.

- When the control tablet and user's computer are in the same WiFi, the data can be transferred to other devices with the LocalSend App. User need to install the LocalSend App or PC software on their devices.
- User can also connect the Bluetooth to other devices and send the data by Bluetooth.

## Operation Procedure

### Startup and Self-Check

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After confirming that all cables and tubing are properly connected, turn on the power switch to start the instrument.

Power on the tablet and log in to the operating software, then open the H<sub>2</sub> cartridge valve. The instrument will automatically ignite and operate according to the settings defined in the parameter configuration interface. After the system stabilizes, testing can be performed.

### Shutdown

---

Tap "Stop" on the main interface, close the H<sub>2</sub> cartridge valve, and then turn off the power switch.

Before shutting down the instrument, ensure that there is no high-concentration residue remaining in the heated sampling line or internal tubing. Otherwise, high-concentration components may condense in the tubing during cooling and adversely affect subsequent measurements.

After completing a test, it is recommended to operate the instrument and sampling line in clean, low-concentration ambient air for 3–5 minutes before shutdown.

### Standard Operation Procedure

---

#### 1. Preheat

After FID ignition, the sampling line, oven, and FID will heat up according to the set value. Generally, the instrument needs preheating for 15 min or longer to stabilize.

#### 2. Leak Check

Use a cap to seal the sampling line inlet and then press Leak Check on the main interface. The software will perform leak check automatically and provides a prompt on whether the leak check test passed or not.

If the leak check failed, it's necessary to locate the air leakage in the pipelines.

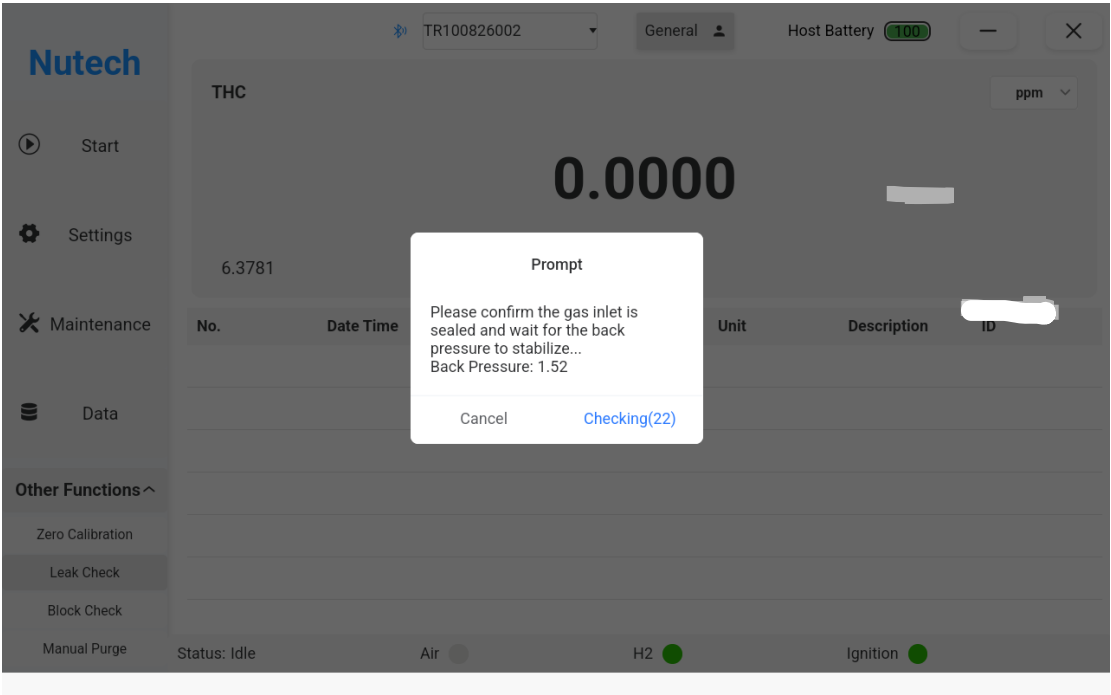


Figure 16 Leak Check

### 3. Zero Calibration

After instrument is stabilized, press **Zero Calibration** on the main interface. Press Start and wait for 30 seconds and the zero calibration is completed.



Figure 17 Zero Calibration Interface 1

User can also press Auto Zero button on Parameter Settings interface to complete zero calibration.

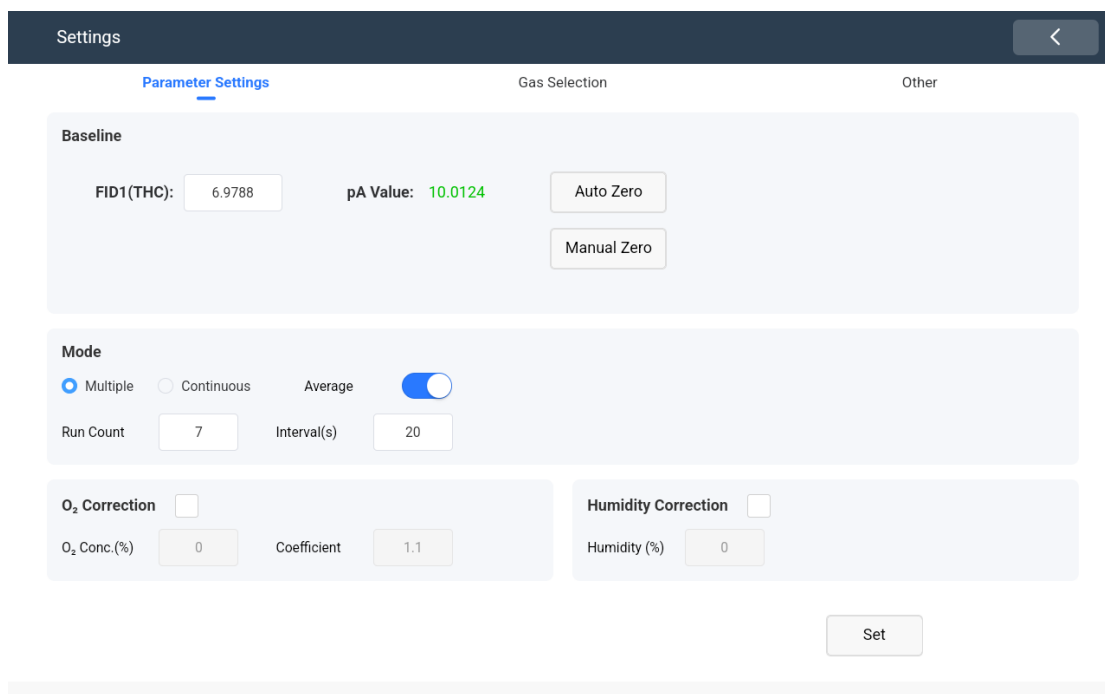


Figure 18 Zero Calibration Interface 2

### 3. Span Calibration / Drift Correction

Use the standard gas whose concentration is close to the sample or close to 80% of the span, and inject the standard into the instrument through the sampling line. Check whether the test results meet the quality control requirements. If not, span calibration should be performed.

Wait for the results to appear in the data box and select a stable result by long pressing or right click this result. A Span Calibration option pops up. Click **Reset All** and then input the concentration of the standard gas and click OK.

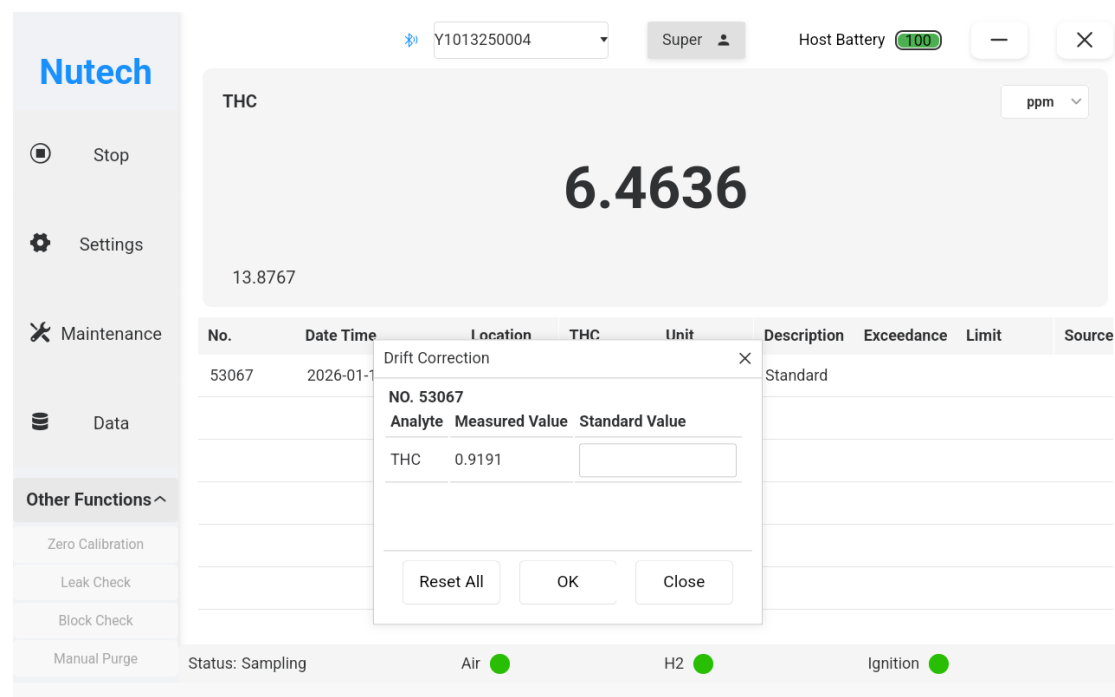


Figure 19 Span Calibration / Drift Correction Interface

Different concentrations of standard gases only affect the calibration in the corresponding span. It is recommended to purchase 5 cylinders of methane standard gas: 4ppm, 40ppm, 400ppm, 4000ppm and 30000ppm. 4ppm is used for 0-5ppm span. 40ppm is used for 4-50ppm span. 400ppm is used for 40-500ppm. 4000ppm is used for 400-5000ppm span and 30000ppm is used for above 10000ppm span.

### 4. Start Testing

After the above preparations are completed, press the **Start** button on the main interface or press the sampling line button for 3 seconds to start the test.

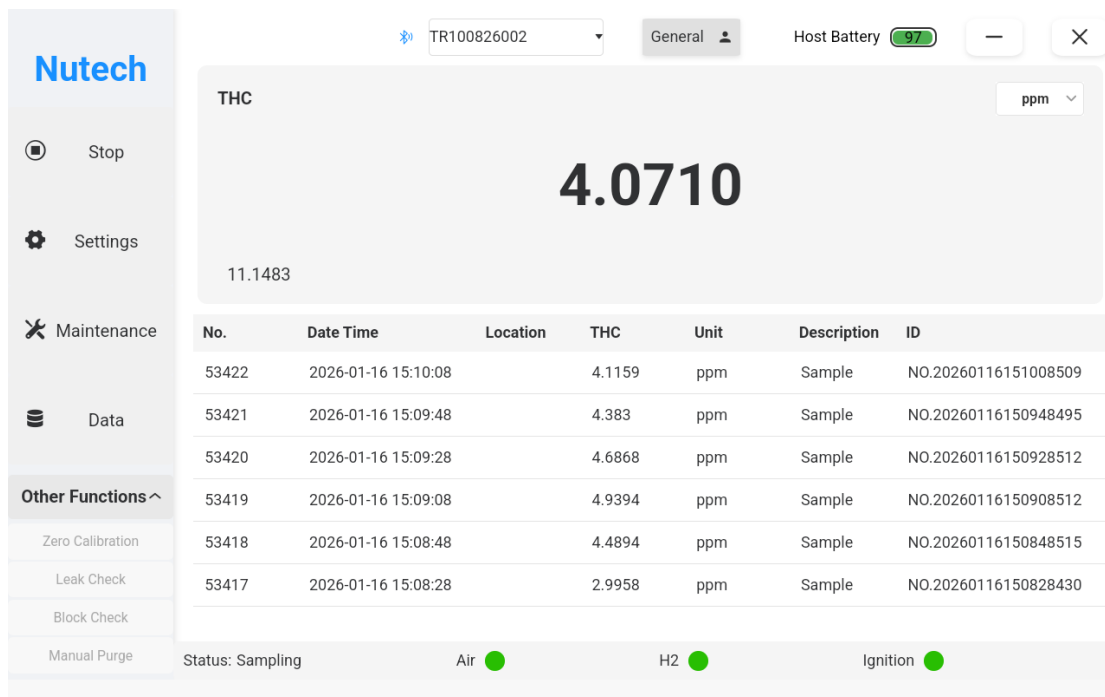


Figure 19 Testing Interface

## 5. End Testing

After the measurement is completed, remove the sampling line from the emission source and place it in low-concentration ambient air. Press the **Manual Purge** button to purge the instrument for 3–5 minutes. Press Stop when the reading returns close to zero (e.g., <10 ppm).

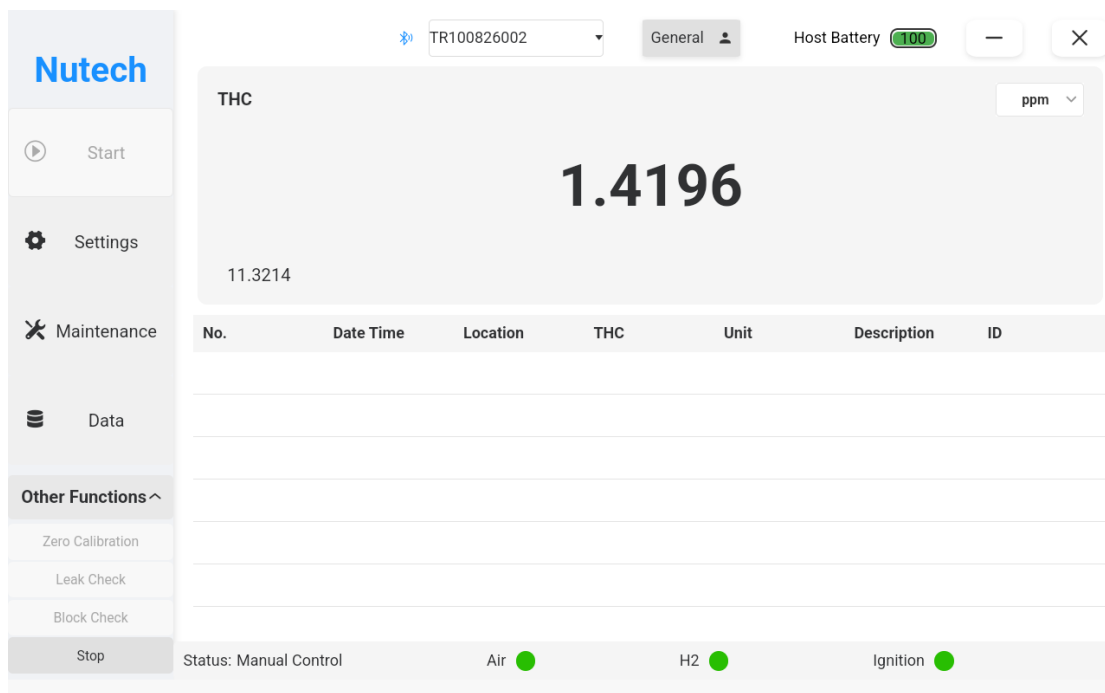


Figure 20 Manual Purge Interface

Power off the instrument and the control tablet, then close the H<sub>2</sub> cartridge valve to complete the measurement.

## Maintenance & Troubleshooting

### Maintenance

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The following maintenance operations are recommended for users to follow.

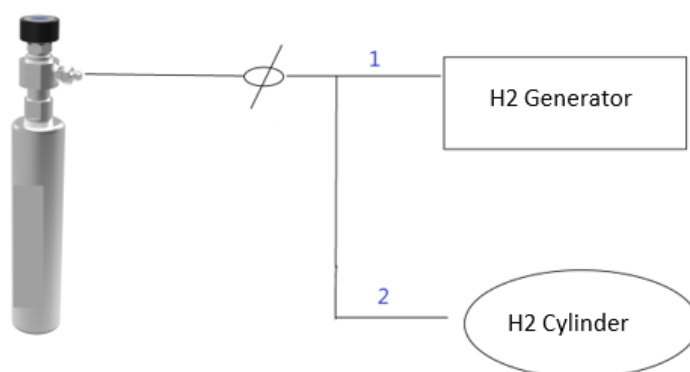
- If the instrument is not used for a long time (more than 3 months), regular (once every month) empty running is beneficial to its maintenance.
- Replace the filtering parts as per the requirements in the Accessories & Consumables chapter.
- When the instrument is not in use, the gas inlets should be plugged to avoid dust and water vapor entering.
- The instrument has a condensate discharge device inside. Please ensure that the outlet of the drain pipe under the instrument is not blocked.

Users can also purchase maintenance service provided by Nutech and its authorized partner.

### H<sub>2</sub> Cartridge Filling

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Connect the H<sub>2</sub> cartridge to the H<sub>2</sub> generator or high-pressure H<sub>2</sub> cylinder like below picture shows. Regulate the output pressure of the H<sub>2</sub> generator or cylinder to be 1Mpa. Open the H<sub>2</sub> cartridge and fill it for 2 hours. The H<sub>2</sub> cartridge needs to be released for a few seconds after the filling is completed.



### **Air Purification Tube Maintenance**

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N3000 THC version uses indicating silica gel to dry and purify air. Please replace the tube promptly when the silica gel turns red.

### **Troubleshooting**

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If the instrument has the following faults, you can refer to the corresponding method to troubleshoot.

#### **Can't turn on instrument**

1. Check whether the charger is connected to the instrument and whether the charger is faulty.
2. Check whether the power cable of the instrument is connected normally and whether the battery is powered normally.
3. Check whether the battery is defective.

#### **FID ignition failure**

1. Check whether the real flow rate of H2 and air is consistent with the set flow rate with a flow meter.
2. Check whether the system has good air tightness.
3. Check whether the FID nozzle is blocked.
4. Check whether the ignition wire is deformed or oxidized.
5. Check whether the FID control line has output voltage and the output is normal (1.3V).

#### **FID has no signal output**

1. Check whether FID signal line is in good contact.
2. Check whether the FID amplifier board is faulty.

#### **Sampling line not heated**

1. Check whether the thermocouple is faulty.

2. Check whether the sampling line is short-circuited.
3. Check whether the contact between the sampling line and the instrument is good.

**Low response when measuring high concentration sample**

Check whether there is leakage from the sampling line and internal pipes of the instrument.

**Low flow rates of FID, H2 and air**

Check whether the corresponding pipeline is leaked or the corresponding valve is blocked.

**No H2, air and sample pressure**

1. Check if the pressure sensor is leaking or faulty.
2. Check if the air pump is faulty.
3. Check if there is a gas leak at the front end of the pressure sensor.
4. Check the amount of remaining gas in the H2 cartridge.

**Nutech Instruments, Inc.**

Technical Support

Call: 972-480-8908 Fax: 972-480-8308

E-mail: [services@nutechins.com](mailto:services@nutechins.com)