# NT8313 Pump-priming Portable Ozone(O3)

# Gas Detector Operation Manual


(Please read this introduction carefully before use and installation)

**（Rev 1.0）**

## Precautions

Since some steps or improper operation, and ignore certain specific conditions may impair the performance of the instrument, for the safety and measure performance of the instrument, please strictly refer to the following instructions to operate and measurements.

1、 Before use this instrument, please read carefully and total understand the content of this manual, strictly follow every stipulate of this manual.

2、Since this instrument have build-in high capacity battery, so please don't test it in high temperature environment.

3、 Please test performance before use it, if the instrument can not pass the performance test, can recalibration or restore factory calibration.

4、 The vent of sensor must keep clean, Sensor vent blockage or dirt of water network cause reading lower than the actual concentration.

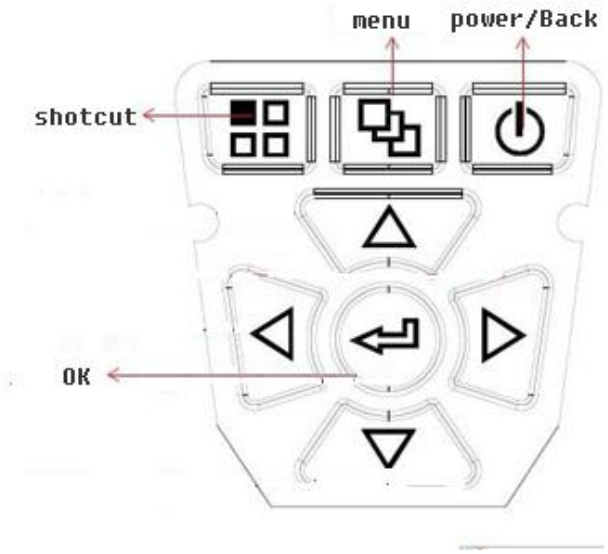
5、 The change of atmosphere pressure may cause the reading suddenly change.

6、 When detect combustible gas, the concentration of oxygen in air will affect the concentration of combustible gas.

7、 This instrument operation temperature is -20-70 °, but the different sensor may cause operation temperature range reduce.

## I Product Introduction

WASP-XM handheld pump gas detector is a alarm instrument, can continuous detect combustible gases, oxygen, or toxic gas concentrations and limit of the operating environment, is essential protective equipment for the production of industrial safety. 3.5-inch TFT LCD display, real-time observation of the target gas concentration,the concentration values color will change when the hight and lower two level alarm . It applies to toxic gas leak disaster, underground pipe or mines, industrial gas detection, power, petrochemicals, medical equipment, cold storage and furniture workplace environment and other places, can effectively ensure staff safety from abuse, production equipment from damage. With built-in air pump sampling methods, fast response, low noise.




## II Function Feature

| | |
|---|---|
| Audio alarm | For audio, prompt; there are two different frequency and duration for concentration alarms.<br>Lower concentration：2HZ<br>Hight concentration：4HZ<br>Operate failure：4HZ，ring 2<br>Operate success：1HZ，ring 1<br>Status indicator：4HZ，ring every 5 minutes<br>In addition to the oxygen sensor, higher than the low concentration and less than high concentration produce the low concentration alarm, higher than the high concentration produce high concentration alarm. |
| Vision alarm | If there's lower concentration alarm in test status, the number of indicate concentration value display yellow, if have high concentration alarm will display red typeface.<br>the icon in the status bar also displays alarm status. |
| USB communication | Instrument have USB communication port, will communicate with computer directly with 9600 byte speed. |
| Color LCD display | Equipped with a full-color 3.5-inch TFT screen, numeric display and graphics can be displayed simultaneously, so that the test is very intuitive. |
| Test record | Instrument uses a high-capacity FLASH memory chips, will be able to store a month (in 30 seconds recording) measurement data, and you can view the data with the instrument, you can use a computer to view the data. |
| Alarm record | Instrument will record recently 4 times alarm time and type. |
| Calibrate record | Instrument will record recently 4 times calibrate time and calibrate |

| | |
|---|---|
| | range size. |
| Function menu | calibrate-zero calibrate-range calibrate-restore<br>factory-ADC value-calibrate period<br>alarm-lower value alarm-high value alarm-TWA-STEL-alarm mode<br>Parameter set-gas type-decimal-gas range-gas unit-CFC module<br>(Only when the gas type is TVOC)<br>System set-address-back light brightness-back light brightness-back light time-pump transfer set- turn off time-store alternation-language set<br>Record check-history record-alarm record-calibrate record<br>delete record-store capacity<br>Time set-year-month-date-hour -minute-second |

Charge

This Instrument use lithium battery supply power, since no full charge when out from factory, so need fully charge before use it, follow below steps

1. Plug USB cable
2. In start status see if the battery status icon is charge icon。  ；If in turn off status plug USB, then charge icon will illumine。
3. It will take about 8 hours to charge full.

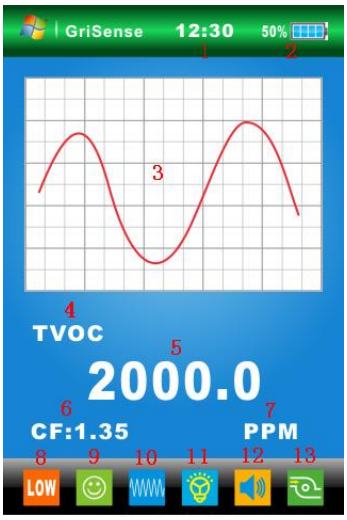
In the top bar can see the icon of different battery ,including percentage of remain battery.

Audio will alarm when instrument battery is less then 2%, will turn off when 0%.

## III Basic operation

Instrument turn on interface：instrument will read instrument parameter when turn on, if inner component operate normal, if the battery is normal. Turn off key will shield when turn on.Take the VOC detector interface as the example.


Turn on interface




Main interface

| | | | |
|---|---|---|---|
| 1 | Time | 8 | High lower value alarm |
| 2 | The battery area | 9 | TWA,STEL alarm |
| 3 | Curve display area | 10 | Fault ,error code |
| 4 | Gas type | 11 | Back light grade |
| 5 | Measure concentration | 12 | Alarm mode |
| 6 | CFC modulus | 13 | Pump speed |
| 7 | Gas unit | | |

Instrument in the normal state can not only display the concentration with digital but also display the concentration with curve. in the top bar shows the current real time, the current power, In the bottom bar has high and low values alarm icon, TWA, STEL icon, fault, error icon, backlight level icon, alarm mode icon, pump speed icon. These make the user real-time observe the running status of the instrument.
Please know the function of every key before use it

| | |
|---|---|
| ⏻ | Long press power turn on or turn off, short press is return key function. |
| ⧉ | Menu key： in test interface press menu key into menu set interface. |
| ▦ | Shortcut key： in test interface, press shortcut key into shortcut menu set. |
| ↵ | OK key |
| △ | Up key: add function and up move function |

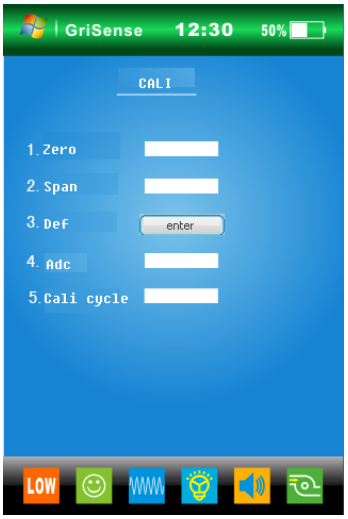
| | |
|---|---|
| ▽ | Down key：reduce and move down function |
| ◁ | Left key：shift function |
| ▷ | Right key：shift function |

In main menu press key will into menu main interface，alarm, store record, turn off function will be limited. Before into menu key except shortcut menu key and power key,other keys will be shielded and have no function, after go to menu key can press △, ▽, ◁, ▷ into sub menu selection, after selected, press ↵ into operate.


Instrument calibration：

Non-professionals misuse, if misuse may cause tests result not precision; if calibration errors, please re-calibration, or restore the factory default, if still not solved, please return to the factory

When select instrument calibration press ↵ , can do zero calibration, range calibration, restore factory default calibration, ADC value，calibrate interval set option, operating person can press △, ▽ key to select sub menu, after selected, press, ↵ into operate.





**Zero calibration：** after selected zero calibration, press confirmation key to calibrate, also can press return key cancel this zero calibration.；

**Range calibration：** after selected range calibration, press confirmation key to calibrate, at this time can press △, ▽ key to add or reduce；press ◁, ▷ key to shift to numbers set， after set, press confirmation key to finished calibration or press return key to cancel this calibration；

**Restore factory calibration ：** after selected restore factory calibration press confirmation key enter， or press return key cancel this operate.；

Calibrate interval：this operation is to note every types of sensor calibration period，normally, according to factory identification is ok.， or press confirmation key to modify， at this time press △， ▽ key to add or reduce； when finished set, press confirmation key to finish operation or press return key to cancel this operation；

**Alarm set**

When select alarm set, press to enter, can set lower value alarm, high value alarm,TWA,STEL alarm，alarm sound set , operating person can press △， ▽ key to select sub menu, then press to operate.

**Lower value alarm set：** after selected lower value alarm press confirmation key to set，at this time can press △， ▽ key to add or reduce； press ◁, ▷ key to shift to number set，after set press confirmation key to finish operation or press return key to cancel this operation；

**High value alarm set：** after select high value alarm, press confirmation key to enter set，at this time, can press △， ▽ key to add or reduce；press ◁, ▷ key to shift to number set， after set press confirmation key to finish the operation or press return key to cancel this operation；

TWA alarm set: after select TWA alarm, press confirmation key to enter set，at this item , can press △， ▽key to add or reduce； press◁, ▷key to shift to number set，after set press confirmation key to finish operation or press ⏻ return key to cancel this operation；

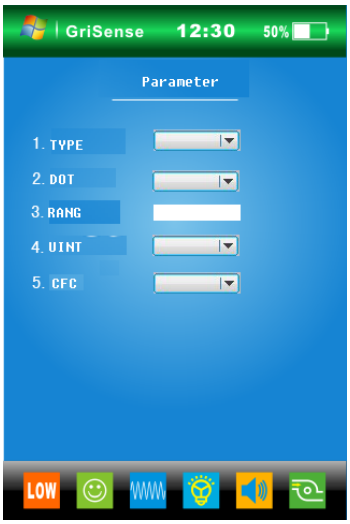
**【Note：first set high value alarm , then set lower value alarm,. Otherwise lower value alarm can't be set 】**

**STEL alarm set：** after selected STEL alarm press confirmation key to enter set，at this time can press△， ▽key to add or reduce；press◁, ▷key to shift to number set， after set press confirmation key to finish operation or press ⏻ return key to cancel this operation；

**Alarm sound set： after selected sound set, then press** confirmation key to enter set，at this time to press△， ▽ confirmation to select (ON) or（OFF），after set to press confirmation key to finish operation or press ⏻ return key to cancel this operation；

**Parameter set**

After selected parameter set, then press to enter，can set gas type, decimal, gas range, gas unit.CFC(only when gas type is TVOC can set) operation person can press△， ▽ key to select sub menu，after selected to press to enter operation.



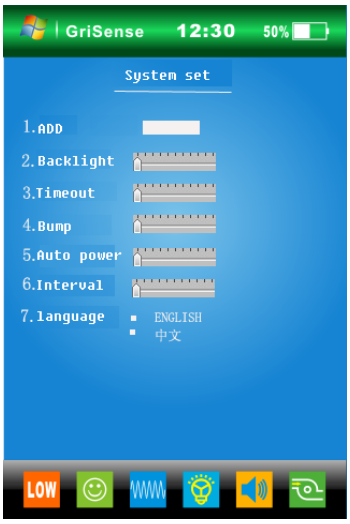

**Gas type set：** after selected gas type, then press confirmation key to enter set，at this time, can press△， ▽ket to add or reduce； after set, press confirmation key to finish operation or press ⏻ return key to cancel this operation；

**Decimal set：** after select decimal, then press confirmation key to enter set，at this time, can press△，▽key to add or reduce；after set, then press confirmation key to finish operation or press ⏻return key to cancel this operation；

**Unit set：** after selected gas unit, then press confirmation key to enter set，at this time can press△， ▽key to add or reduce；after set, then press confirmation key to finish operation or press ⏻return key to cancel this operation；

**System set**

After selected system set, then press↵to enter，can set address, backlight brightness, backlight time,pump speed, turn off set，store time，language set。Operating person can press△，▽key to select sub menu，after select, then press↵to enter operate.




**Address setting：** after selected address, then press↵confirmation key to enter set，at this time, can press△，▽key to add or reduce；press◁，▷key to shift to number set，after set , then press↵confirmation key to finish operation or press⏻return key to cancel this operation；（address size is （1-255））

**Backlight brightness setting：** after selected backlight brightness , then press↵confirmation key to enter set，at this time can press◁，▷key to select（backlight only two grade）；after set. Press↵confirmation key to finish operation or press⏻return key to cancel this operation.

**Backlight time setting：**after selected backlight time, then press↵confirmation key to enter setting，at this time, can press◁，▷key to select（backlight time unit is seconds）；after set, press↵confirmation key to finish operation or press⏻return key to cancel this operation.

**Pump speed setting** after selected pump speed, press↵confirmation key to enter setting，at this time, press◁，▷key to select（pump speed only have three grade）；after setting, press↵confirmation key to finish operation or press⏻return key to cancel this operation.

**Off time setting：** after selected off time, press↵confirmation key to enter setting，at this time , can press◁，▷key to select（off time unit is minutes）；after set, press↵confirmation key to finish operation or press⏻return key to cancel this operation.

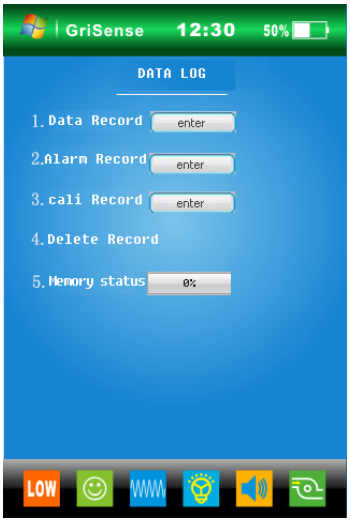
**Store time setting：** after selected store time, press↵confirmation key to enter setting，at this time , can press◁，▷key to select（store time unit is second）；after set, press↵confirmation key to finish operation or press⏻return key to cancel this

operation.

**Language setting：** after selected language , press⏎confirmation key to enter setting， at this time , can press△, ▽key to select. after set, press⏎confirmation key to finish operation or press⏻return key to cancel this operation.

**Data Log**

When selected data log, then press⏎to enter, can check data record, alarm record, calibration record, delete record, store capacity.Operation person can press△, ▽key to select sub menu， then press⏎enter operating check.




**Data record check ：** select history, then press⏎confirmation key to enter to check， at this item, can press△, ▽key to turn page to check every page twenty record;

**Alarm record check：a**fter press⏎ confirmation key record only keep the latest

**Calibration record check：**
record
to enter to check， alarm four calibration record.

**Delete record check：**after press⏎ confirmation key press ⏻ return key to

**Memory status check:**
present the percent of store


selected alarm record, to enter to check， alarm four alarm record..

after selected calibration press⏎ confirmation key record only keep the latest

select delete record, to enter to delete， also can cancel this operation；

store capacity only check capacity in total capacity.

**Time & data**

After selected time setting, press⏎to enter，can operate year，month, date, hour, minute, second. Operating person can press△,▽key to select sub menu, then press⏎enter to operate.

**Year setting：** after selected year setting, then press⏎confirmation key to set, at this time, can press△，▽key to select,； after setting, press⏎confirmation key to finish operation or press⏻return key cancel this operation；
**Month setting** after select month, press⏎confirmation key enter setting，at this time, press△，▽key to select； after setting press⏎confirmation key to finish operation or press⏻return key cancel this operation；
**Day setting：** after selected date setting, press⏎confirmation key to enter setting，at this time ,can press△ ▽ key to select; after setting, press⏎confirmation key to finish operation or press⏻return key to cancel this operation；
**Time setting：** after selected time setting, press⏎confirmation key to enter setting，then press△，▽key to select； after setting, press⏎confirmation key to finish operation or press⏻ return key to cancel this operation；

**Minute setting：** after selected minute setting, press⏎confirmation key to enter setting, then press△，▽key to select； after setting, press⏎confirmation key to finish operation or press⏻ return key to cancel operation；
**Second setting：** selected second setting, press⏎confirmation key to enter setting, then press△，▽key to select； after setting, press⏎confirmation key to finish operation or press⏻ return key to cancel operation；

Appendix I: Fault Code Meaning

（Fault）type

| Fault code | Fault reason | Introduction | Step |
|---|---|---|---|
| F1 | The mico-processor fault | MCU running unusual | Re-start, still unusual, then return to factory to test |
| F2 | Store fault | Store can’t storage | Return factory to test |
| F3 | Data invalid | Date in storage is invalid | Return factory to test |

| | | | |
|---|---|---|---|
| F4 | Analog circuit unusual | ADC input voltage over normal range | Return factory to test |
| F5 | Out IC fault | Can't read component（including AD、DA、digit potential device、clock、digit humiture sensor etc） | Return factory to test |
| F6 | Probe abnormal | Can't read probe data or probe return abnormal report | Return factory to test |
| F7 | Communication abnormal | Communication with the host computer（like S485、wireless、CAN）abnormal | Check wire road and configure, still abnormal, then return factory to test |
| F8 | Power voltage abnormal | Power voltage too high, too lower or too volatile | Change power supply,still abnormal, then return factory to test |
| F9 | Gas pump abnormal | Open circuit or jam | Check or clear gas pump |

Warning type

| Warn code | Warn reason | measure |
|---|---|---|
| D1 | Calibration interval expire | Re-calibration |
| D2 | Calibration invalid or no calibration | Re-calibration |
| D3 | Sensor life over | Change new sensor |
| D4 | Measure gas overload | Change large range sensor |
| D5 | Humiture over allowed range | Stop working |
| D6 | Clock set invalid | Re-set |
| D7 | Battery no power or power too lowe | Change battery |
| D8 | Reserved | |
| D9 | Reserved | |

Operation error type

| Error code | Error reason | Introduction | Measure |
|---|---|---|---|
| E1 | Input A1 value error | Input A1 value≥A2 value | A1 value |
| E2 | Input A2 value error | Input A2 value＞range value or≤A1 value | Input A2 value again |
| E3 | Input range value error | Input range value is 0 or＞50000 | Re-input range value |
| E4 | Zero calibration error | Calibration ADC value≥20％ max ADC value | Fill N2 zero calibration |
| E5 | Range calibration error | Calibration ADC value≤25％ max ADC value | Change high concentration standard |

| | | | |
|---|---|---|---|
| | | | gas or sensor |
| | | Input calibration point≤25 % range or≥120％ range | Re-input calibration value |
| E6 | Input TWA error | Input TWA value＞STEL value | Re-input TWA value |
| E7 | Input STEL error | Input STEL value＜TWA value | Re-input TWA value |
| E8 | Reserved | | |
| E9 | Reserved | | |

Alarm Tips

| Alarm type | Display | Sound, light, vibration | introduction |
|---|---|---|---|
| Lower alarm | Low or A1 | Sound lith vibrate， 1HZ(interval 0.5s)continue | |
| High alarm | High or A2 | Sound light vibrate， 2HZ(interval 0.25s)continue | |
| TWA | TWA | Sound and light，every 10 second one time， every two short（two 0.25s interval 0.25s） | |
| STEL | STEL | Sound light，every 10 second one time，every time three short（ three 0.25s interval two 0.25s） | |
| warn | D1-D9 | sound，light every 20 second one time，every time two long（two 0.5s interval 0.25s）， | |
| fault | F1-F9 | sound，every five second one time，every time three long（three 0.5s interval two 0.25s）；light always on | |
| error | E1-E9 | sound， every time long ring 0.5 second | |
| Lower voltage | Low Voltage | Sound ， 30 second ring one time，every time two short（ two 0.25s interval 5s） | Auto enter to save power mode |
| Auto off | Auto OFF | Sound light，every two second one time, every time 0.5 second， total five times | |
| Normal off | Power OFF | Sound light，one time last two second | |
| Operation done | OK | Sound light，one time last one second | Save successfully |
| Operation failed | FAIL | Sound light，two times short 0.25 second，interval 0.25 second | |
| button | no | sound，one time short 0.25 second | |

Appendix II Common problems and solutions

| | | | |
|---|---|---|---|
| 1 | Can not boot | No battery | Express Mail request battery can not be installed in the instrument, so the battery is removed in the box, install themselves. |
| | | No electricity | Charger to fully charge and then use the detector is recommended for the first time fully charged before use. |
| 2 | In the air, the detector shows the concentration exceeds 1PPM, and instability. | Possible sensor loose, poor contact. Causes the internal void of the inputs of the circuit, voltage drift. | Make sure the connection is normal between the sensor and the circuit board |
| | | Around the ventilation or air-conditioning ventilation system is not closed | Please turn off |
| | | Surrounded by high-power interference sources | Keep away from sources of interference instrument |
| 3 | Detection of gas no reaction | Not the end of the warm-up | Preheat after the end of the measurement |
| | | Sensor is bad connection | Reconnect sensor |
| | | Sensor failure or circuit failure | Contact our Repairs |
| 4 | Exceeds the set alarm value<br>No sound | Check whether the alarm setting mode select full | Check the alarm settings in the sound settings whether the to "ON" |
| | | The buzzer does not work properly | Returned for repair or replacement required |
| 5 | Automatic shutdown | Low battery | Please charge re-use, power is less than 2% of the audio alarm, automatic shutdown reaches 0% |
| | | System settings off time is set too short | Prolonged shutdown time or set to automatically shut down 0m |
| 6 | Reading instability | Polarization not enough time | Continued polarization |
| | | Sensor failure | Replace sensor |

| | | | |
|---|---|---|---|
| | | Circuit fault | Back to the factory for repair |
| | | Surrounded by sources of interference, such as high-power jamming equipment | Move the instrument without interference and keep the area free from vibration |
| | | Airflow around the probe, pressure instability | Holding steady flow and pressure |
| | | AC interference | The instrument power supply circuit access instrumentation, and keep well grounded |
| | | Clogged with dust or probe into the gas chamber | Suction tube or chamber cleaning up dust inside (the latter requires Depot) |