

GT-2000 SERIES MULTIFUNCTIONAL GAS ANALYZER

USER MANUAL



深圳市科尔诺进出口贸易有限公司
ShenZhen korno Import&Export CO.,Ltd

WARNING

Read and understand this instruction manual before operating instrument. Improper use of the gas monitor could result in bodily harm or death.

Periodic calibration and maintenance of the gas monitor is essential for proper operation and correct readings. Please calibrate and maintain this instrument regularly! Frequency of calibration depends upon the type of use you have and the sensor types. Typical calibration frequencies for most applications are between 1 and 3 months, but can be required more than or less often based on your usage.

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Notice

① Button description

There are 8 buttons beneath the display screen, **Up, Down, Back,**

Ok, Run/Stop, Print, Save, Power,

Three operation interfaces: **Detecting, Interface, Menu,**

Parameter setting.

The following form is description for the 8 buttons.

	Detector interface	Menu	parameter setting
Up	Invalid	Up	Move up
Down	Invalid	Down	Move down
Back	Invalid	Return to previous menu	Return to previous menu
Ok	Enter menu(press and hold for 5 seconds)	Confirm to enter menu	Enter/Select/Save
Run/stop	Pump switch/ Timing detection switch	n/a	n/a
Print	Print instant gas concentration data	n/a	n/a

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Save	Save instant gas concentration data	n/a	n/a
Power	On/Off(press and hold for 5 seconds)	On/Off(press and hold for 5 seconds)	On/Off(press and hold for 5 seconds)

CAUTION:

GT-2000 series multifunctional gas could be work normally only in condition of the pump was switched on

②Gas analyzer Processing Operation under Out-range

Status

Users should avoid to have sensor impacted by the gas with a pressure value greater than the maximum of the analyzer, which might affect the service life and precision of the analyzer, or even directly damage the analyzer.

When a user accidentally makes out-range operation, he should evacuate the instrument out of the detecting site and place it in the clean air for more than half an hour. During the time, user should observe whether the density value of the instrument is keeping decreasing or not. If it can straightly go down to normal value, then he can continue to use it after the zero

calibration of instrument. While the instrument after the out-range operation and user has placed it in clean air for hours, the density value remains high, then it should be sent back to the manufacturer or agent for maintenance, be ready to replace the sensor.

Special Note: Detector damage resulted from out-range operation is not within the warranty.

③Detector Calibration and Warranty

We guarantee all analyzer were precise calibrated with certain density standard gas. It's not necessary for customer to re-calibrate the analyzer after purchase unless encounter special situation. Also the calibration need to be operate under the guidance of the professional.

We provide 12-Mounths warranty for the analyzer and 3-Mounth warranty for the accessories. Beside,we have free calibration once a year during the entire product's service life.

④Instruction of analyzer display dimmed

Power capacity protection program had been preset for GT-2000 multifunctional gas analyzer, when no operation were made within 30 seconds the protection program will activate and the display of the analyzer will dim out,user can light up the display by press any button.

⑤GT-2000 Hot Key Instruction

Mute: When analyzer is in the state of alarming user can mute the analyzer by pressing the “Up”or “Down”button.

Save and print manually:When storage mode was preset as manually,User can save concentration data of each channel by pressing “Save” and hearing a “DI” sound,history data can be view in the “History data log” menu.Press “Print” to print instant gas concentration of each channel(Printer connected is required)

Enter function menu: When analyzer is in the detection menu user can enter system menu by pressing “Ok” button for 5 seconds

⑥Parameter modification instruction

User can modify all parameters by “Back”,“Up”,“Down”,“Ok”buttons.

1.Product Brief Introduction

GT-2000 multifunctional gas analyzer is portable gas analyzer/alarm which can be configure flexibly up to 6 gas sensors.With a import gas sensor and most advance nanometer semiconductor technology, GT-2000 multifunctional gas analyzer can detect corresponding gas concentration at the same time rapidly and precisely,we maintain a leading position in domestic level and our products are famous of high stability and repeatability .User can custom setting all parameters to ensure the operations are user-friendly.6000mA built-in high capacity polymer rechargeable battery to ensure the long standby time. The technical indicators,gas concentrations and history data can be display in the 3.5 inches IPS technical grade screen,User can save concentration data,print and output data,detect temperature and humidity level.

2.Key Feature

- ◆ With the most advance nanometer semiconductor technology ,ultra low power 32bit microprocessor,24bit ADC data acquisition chip,outstanding accuracy.
- ◆ 3.5 inches IPS technical grade display with a pixel up to 320*480,display technical indicators and gas concentration value perfectly.
- ◆ Three concentration units are available PPM,%VOL,mg/m3.
- ◆ User can combine different sensor,1-6 kinds of gas can be detect at the same time,temperature and humidity sensor and other kind of

sensors are available.

- ◆ Up to 100,000 groups data can be storage,user can view history data on the display and data output is available.
- ◆ With temperature and humidity detection,user can detect temperature and humidity value
- ◆ Four operation modes are optional:Detection mode,Storage mode,Display mode,Pumping mode.
- ◆ With high-power pump allow device working under tiny negative pressure condition,the reasonable gas chamber design ensures that the sensor is not affected by the pressure.
- ◆ With over-voltage protection,overcharge protection,electrostatic prevention,magnetic-field interference prevention
- ◆ All software automatic calibration, sensor up to 6 levels target calibration,ensure the accuracy and linearity of the entire measurement,also with data recovery function.
- ◆ Chinese and English operation model are available,user-friendly.
- ◆ With temperature and humidity compensating function.With dust filter and dust-proof design allow device applies in all sorts of harsh conditions.

3. Technical Parameters

Product type:	Multifunctional gas analyzer(Customize according to user's need)		
Scalable gas sensor:	User can customize 1-6 gas sensors in any combination,please refer to the sensor parameters		
Temperature and humidity:	Temperature detection range:-40 ~ 120℃ Humidity detection range:0-100%RH		
Detection pattern:	Pumping,with built-in high-power pump allow device working under tiny negative pressure condition		
Indication accuracy:	$\leq \pm 3\% \text{F.S}$	Linearity error:	$\leq \pm 1\% \text{F.S}$
Response Time:	$\leq 20 \text{ S (T90)}$	Zero drift:	$\leq \pm 1\% \text{ (F.S/Year)}$
Recovery Time:	$\leq 20 \text{ S}$	Repeatability:	$\leq \pm 1\% \text{F.S}$
Detection Mode:	Real-time detection mode and timing detection mode can be switch freely		

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Storage pattern:	Automatically saving and manually saving is available,Up to 100,000 groups data ,user can view history data on the display.		
Explosion proof sign:	ExdII CT4 (IA)	Shell material:	Aluminium
IP rating:	IP65	Operating temperature:	-30 ~ 60℃
Power Supply:	6000mA high capacity polymer rechargeable battery	Operating humidity:	≤95%RH, Non-condensing
Dimensions and Weight:	Approx. 230*120*220 mm (L×W×H) Approx. 3.0 Kg (net weight)	Working pressure:	-30Kpa ~ 100Kpa
Accessories:	Case,User manual,Certification,12V DC Charger,USB cable,Sample handle,0.8M hose		

4.Product Structure



5.Operation Instruction

5.1Button Description

There are 8 buttons beneath the display screen:Up,Down,Back,OK,
Run/Stop,Print,Save,Power

Three operation interface: Detector interface、 Menu、 Parameter setting.

The following form is description of the 8 buttons.

	Detector interface	Menu	parameter setting
Up	Invalid	Up	Move up
Down	Invalid	Down	Move down
Back	Invalid	Return to previous menu	Return to previous menu

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Ok	Enter menu(press and hold for 5 seconds)	Confirm to enter menu	Enter/Select/Save
Run/stop	Pump switch/ Timing detection switch	Invalid	Invalid
Print	Print instant gas concentration data	Invalid	Invalid
Save	Save instant gas concentration data	Invalid	Invalid
Power	On/Off(press and hold for 5 seconds)	On/Off(press and hold for 5 seconds)	On/Off(press and hold for 5 seconds)

CAUTION: GT-2000 multifunctional gas analyzer will perform normally only in condition of the pump was switched on

5.2 Power On

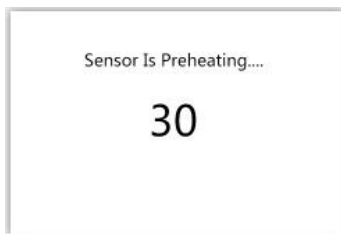
Long press power button for five seconds until the “DI” sound then the display and red signal light turn on, The screen appears: Sensor checking (3 seconds), Sensor information (1 second), Sensor preheating and automatically start the pump (30 seconds count down) in sequence as it show in figure 1-3, analyzer will start after the count down and enter detection interface as it show in figure 4



1

EX	100.00	PPM
HCL	100.00	PPM
CH2O	50.00	PPM
HCN	100.00	PPM
SO2	2000	PPM
HBr	10.00	PPM

2



3

2016-12-16 14:50:32 25.2°C 34%RH

EX	100.0	HCL	100.0
	%LEL		PPM
CH2O	100.0	HCN	100.0
	PPM		PPM
SO2	100.0	HBr	100.0
	PPM		PPM

4

5.3 Power Off

In normal detection mode long press power button for five seconds until the “DI” sound ,display shows “Power off” as it show in figure 5,device will be shut off within 1 minute .



6.Operation Interface

6.1 Gas Detection Interface

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Under normal-detection mode,according to the number and types of sensors in the device,there are different interfaces: single gas detection mode as shown in figure6(EX for example),two kinds of gas detection mode as shown in figure 7 (EX、 HCN for example) ,three kinds of gas detection mode as shown in figure 8(EX、 HCN、 SO2 for example),four kinds of gas detection mode as shown in figure 9(EX、 HCN、 SO2,HCL for example).

Icons at the left top of the display (refer to figures above) shows “date”, “time”, “temperature”, “humidity”, at the right top of the display shows

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the “pump status””alarm status” ,”battery capacity” ,,take figure 9 for example,there are four channels ,channel 1 at the left top(EX),channel 2 at the right top(HCL),channel 3 at the lower left(HCN),channel 4 at the lower right(SO2);figure indicate corresponding gas concentration in each channel,lower left”EX” is the gas’s molecular formula,lower right”%LEL ” is the concentration unit;when one or several gas channel reach the alarm value,there will be a alarm sign under corresponding concentration figure.



6



7



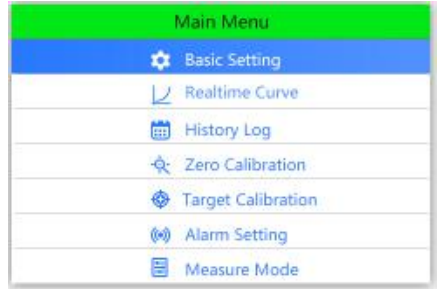
8



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6.2 Function Menu Instruction

Long press "OK" button for 5 seconds to enter function menu as shown in figure 10. Eleven sub-menus are including in function menu: Basic setting、History Log、RealTime Curve、



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Zero calibration、Target calibration、Alarm setting、Measure Mode、Storage setting、Print Setting、Time Setting、Factory Setting. In main menu move the cursor to different sub-menu by press "Up" and "Down" button, press "Ok" to enter corresponding sub-menu, press "Back" to return to normal detection interface or previous menu.

6.2.1 Basic Setting

In Basic setting menu user can see various setting as shown in figure 11, press "Up" and "Down" button to move the cursor, press "Ok" to enter sub-menu and modify parameters.

1. Sensor setting: (as shown in figure 12) User can set detection range and units (ppm, mg/m³, %VOL) of different gas

2. Channel setting:In this menu user can activate/shield one or various gas channels as shown in figure 13,and also allow user to check channel address.
3. Temp Correction:In this menu allow user to modify the temperature parameter manually as shown in figure 14.
4. Humi Correction :In this menu allow user to modify the humidity parameter manually as shown in figure 15
5. Language setting:User can change system language to Chinese or English in this menu as shown in figure 16



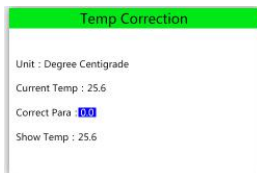
11

Sensor	Range	Unit
EX	0.01	PPM
HCL	100.00	PPM
CH2O	50.00	PPM
HCN	100.00	PPM
SO2	2000	PPM
HBr	10.00	PPM

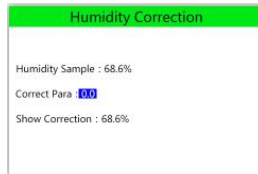
12

Sensor	Range	Unit
EX	1	Open
HCL	2	Open
CH2O	3	Open
HCN	4	Open
SO2	5	Open
HBr	6	Open

13



14



15



16

6.2.2 History Data Log

User can check history log and curve,export history,clear CH history log,clear all history log in"History Data Log"menu as shown in figure 17.Enter "Check History Log" interface remain the cursor at "Check" and press "Ok" then press "Up" or "Down" to switch between "View","Print","Output" as shown in figure 18.For example in "View" menu press "Ok" user can view all previous concentration datalog . Enter "History Log curve"interface remain the cursor at"Check"and press"OK",Check the history log curve as shown in figure 19. Enter"History Log Export" to export the data as shown in figure 20.



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History Log

Sensor	Quantity	Check
EX	124	Check
HCL	124	Check
CH2O	124	Check
HCN	124	Check
SO2	124	Check
HBr	124	Check

18

History Log Curve

Sensor	Channel	Check
EX	1	Check
HCL	2	Check
CH2O	3	Check
HCN	4	Check
SO2	5	Check
HBr	6	Check

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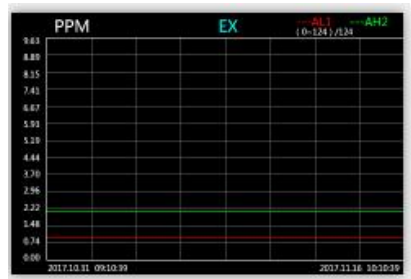
20

6.2.3 Realtime Curve

In this menu users can view all the sensors and corresponding channel. Press “Enter” to check each sensor’s real-time curve as shown in figure 21-22.

Realtime Curve		
Sensor	Channel	
EX	1	Enter
HCL	2	Enter
CH2O	3	Enter
HCN	4	Enter
SO2	5	Enter
HBr	6	Enter

21



22

6.2.4 Zero Calibration

User can proceed zero calibration in this menu, the gas concentration are defaulted set to zero after zero calibration as shown in figures 23-24.


Special Note:

1. Zero calibration must be proceed in fresh air or high-purity inert gas (for example 99.999%VOL N2 etc)
2. Do not operate zero calibration for those gases which already exist in the air, such as oxygen, carbo dioxide, nitrogen.



Zero Calibration		
Sensor	CENC	
EX	0.00	Cali
HCL	0.00	Cali
CH2O	0.00	Cali
HCN	0.00	Cali
SO2	0	Cali
HBr	0.00	Cali

23



Zero Calibration		
Sensor	CENC	
EX	0.00	Cali
HCL	0.00	Cali
CH2O	0.00	Cali
HCN	0.00	Cali
SO2	0	Cali
HBr	0.00	Cali

Calibrate ?

Back OK

24

6.2.5 Target Calibration(Do Not Calibrate Unless You Are Professional)

Find a fresh-air environment.This is an environment free of toxic or combustible gases and a normal oxygen content(20.95%VOL)

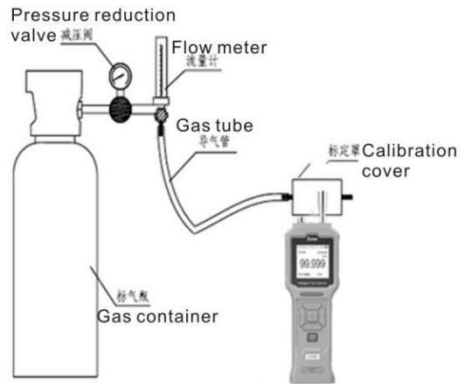
GT--2000 gas analyzer provide 6 levels target gas concentration calibration,as shown in figure 25,this calibration should be operate under conditions of certain standard concentration gas, pressure reduction valve flow meter, calibration cover and make sure all instruments are well connected, otherwise this function is forbidden.

Procedures: Connect all instruments as shown in figure 26,enter target gas calibration interface,release standard gas slowly and control gas flow within 500ml/min,observe the real-time concentration value(concentration value should be increasing),wait until real-time concentration value rise to the peak reading and stay still, user can chose an un-calibrate option to

operate(√ stand for this level has been calibrated and × stand for this level still need to be calibrated);first of all input a concentration value of standard gas then calibrate. Target gas concentration value will set up to the standard gas concentration value after calibration.

Target Calibration		
Sensor	Channel	
EX	1	Enter
HCL	2	Enter
CH2O	3	Enter
HCN	4	Enter
SO2	5	Enter
HBr	6	Enter

25



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6.2.6 Alarm Settings

User can set the alarm limit and alarm mode in this menu, as shown in figures 27-28,there are two alarm value setting, which are high alarm and low alarm. When user set as the low alarm mode, it will trigger alarm when real-time concentration is lower than preset value , when user switch to

high alarm mode, it will trigger alarm when real-time concentration is higher than preset value.

Procedures: Enter alarm settings sub-menu, Move the cursor to “alarm mode”,press “Ok” to select and press “Up” and “Down” to switch alarm mode, then press “Ok” to save your modification.



Alarm Setting		
Sensor	Channel	
EX	1	Enter
HCL	2	Enter
CH2O	3	Enter
HCN	4	Enter
SO2	5	Enter
HBr	6	Enter

27

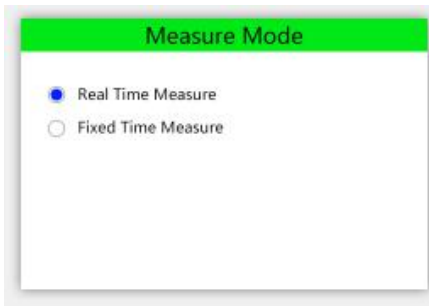


Alarm Setting	
Sensor : EX	Unit : %LEL
Alarm 1 :	00001.00
Alarm Type :	LowAlarm
Alarm 2 :	00002.00
Alarm Type :	HiAlarm

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6.2.7 Measure Mode

User can choose two measure mode:real time measure and fixed time measure as shown in figure 29.When detector is preset as “real-time measure”mode, it provides continuous monitoring and will shows real-time concentration of each channel in the display.And you can select the duration of each fixed time detection, the detect cycle times and the interval between the two fixed time measure



29



30

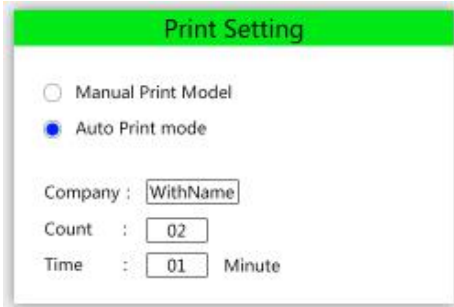
6.2.8 Store Setting

Manually save、 automatically save are optional in this menu,it also allows user to set storage cycle under automatically storage mode. Users can set the storage interval(interval of two storage data) when preset as “ Auto Store Mode” .The maximum setting is 999 second and the minimum setting is 1 second.(figure 30)

6.2.9 Print Setting

Manually print、 automatically print are optional in this menu. It can print data via a micro printer(the micro printer is optional accessory). The report will print with company name,count,time and unit of time as shown in figure

31



31

6.2.10 Time Setting

Time setting menu allow user to set date and time,this time is related to the time of the concentration values are being recorded.(Figure 32)



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Sensor	Channel	
EX	1	Reset
HCL	2	Reset
CH2O	3	Reset
HCN	4	Reset
SO2	5	Reset
HBr	6	Reset

33

6.2.11 Factory Setting

If user proceeded an wrong operation by accidentally or need to reset all parameters to factory setting,you can reset all parameter to factory setting.(Figure 33)

7. Common Faults and Exclusions

Problem: Concentration value is not stably when detector place in air, reading is unstable.

Possible reasons: Electrochemical sensor might interfered with unrelated colorless and odorless gas.

Solutions: Place detector at pure gas environment to see whether the concentration value decreasing or not, if it is that the environment is clear but the concentration value remains high, you need to proceed zero calibration.

Problem: No response or weak response when detecting

Possible reasons:

- 1) Oxygen content value of gas is too low: <5%VOL.

- 2) Gas pressure is too high, the pump can't not afford it.
- 3) Expired sensor might cause the problem too .

Solutions: Make sure the oxygen content value of the gas is higher than 5%VOL when equip with Electrochemistry sensor, Catalytic combustion sensor or Semiconductor sensor. Detector working pressure is -30Kpa~100Kpa, User can proceed zero calibration if has standard gas. If oxygen content value, working pressure are eligible for detection but problems still remain, user should return detector to factory for maintenance.

Problem: Concentration value is unstable when start detecting.

Possible reasons: Normally due to gas oxygen content is too low or changing of gas concentration value.

Solutions: Increase gas oxygen content value and make sure the gas flow speed is stable.

Problem:Weak pumping,or device make a unusual sound while pumping.

Possible reasons:Gas inlet blocked due to too many dust and vapor inhaled.

Solutions: Return to manufacturer to replace the pump,install a dust and vapor filter at the gas inlet.

Problem:Unable to boot up instrument.

Possible reasons:Battery low or empty

Solutions: Try to start the instrument after fully charged the battery,if the problem still remain,user need to return the device to manufacturer.

Problem:Unable to charge the instrument

Possible reasons:Adapter failure or wrong adapter(5-5.5VDC,1-2A)

Solutions: Make sure output voltage of adapter is 5V,user need to change a adapter if the output voltage is not 5V,if the problem still remain after change a adapter,user need to return the instrument to manufacturer.

8.Concentration Datalog Output

Instruction

GT -1000 series gas detector allow user output history datalog via the charge port,there are several steps to output datalog.

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- 1) Install concentration datalog output software in host computer
- 2) Boot up the detector and wait for 30s to preheat the instrument and connect to the computer
- 3) Run the concentration datalog output software in the host computer,make sure the detector is connected to the host computer,meanwhile at the lower left interface of the software will show connection port standby(defaulted baud rate is 115200,do not change)
- 4) Enter the history data interface to output datalog,there will be menu prompts at the both software and detector interface.
- 5) User can preset detector's address in concentration datalog output software(this address need to corresponded to the parameter in "address setting"of the detector)、Channel(Corresponded to the gas channel of the detector)、start time and finish time(datalog storage period should be within the start and finish time)
- 6) Detector allows user to search concentration of certain channel of datalog storage period,datalog can be output as EXCEL format by "datalog output" function.

NOTICE:Connection cable is the USB cable connected to the adapter

Notice

- ◆ Please read User Manual carefully before use the detector.
- ◆ It is strictly forbidden user to disassemble the detector or replacement parts.
- ◆ Installation, adjustment, calibration and parameters setting must be progress by professionals.
- ◆ Regular inspection of calibration is necessary, expired or broken sensor should be replace immediately.
- ◆ It is strictly forbidden to impact sensor with gas which is over detection value.
- ◆ User should prevent drop or impact the detector.
- ◆ It is strictly forbidden to use detector in high temperature, high humidity or high pressure environment ,if Working environment is high humidity, detector need to equip with vapor filter.
- ◆ Man-made damage is not within warranty.

◆ To reduce the risk of ignition of hazardous atmospheres, recharge, remove or replace the battery only in an area known to be non-hazardous. Do not mix old and new batteries or batteries from different manufacturers.

◆ Electrostatic discharge should be proceed before the detection in hazardous area

GT -2000 series products shall only be charged outside hazardous areas, it is strongly recommend use the original charger.

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