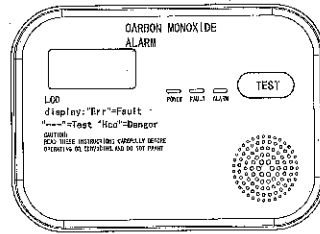


Carbon Monoxide Alarm

User Manual

Model: KD-218A



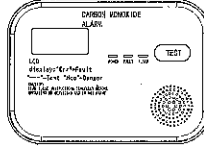
Ningbo Kingdun Electronic Industry Co., Ltd.

Brief introduction

Thank you for purchasing this carbon monoxide alarm produced by our company. Make sure that you read this user manual thoroughly before using the product. This user manual applies to model KD-218A and KD-218E.

This product can emit visual and audible alarms. The two models KD-218A and KD-218E have the same performance and configuration. The only difference is the patterns of the top covers.

Difference between KD-218A and KD-218E: Top cover



This product has the following features:

This alarm has been designed and tested to detect CO in a residential environment. It implements standard BS EN 50291-1:2018. It uses electrochemical sensor and has high sensitivity, stable performance, strong anti-interference, small size and long service life. It can provide sensor fault warning, low battery warning, end-of-life warning and low CO concentration warning.

Important:

Make sure that you read this user manual thoroughly before using the product.

This carbon monoxide alarm is designed to detect carbon monoxide and can NOT be used to detect smoke or any other gas. As the covering area of CO detection is limited, we recommend you to install CO alarms in each room of your home to protect the whole family effectively.

Contents

1 Product features and specifications

- 1.1 Electric Parameters
- 1.2 Brief introduction of the product
 - 1.2.1 Product structure
 - 1.2.2 Parts function
- 1.3 Information indication and power-up
 - 1.3.1 Information indication
 - 1.3.2 Power-up
- 1.4 Operating characteristic
 - 1.4.1 Normal operation
 - 1.4.2 Alarm condition
 - 1.4.3 Low CO concentration warning
 - 1.4.4 Testing

2

- 1.4.5 Alarm silence
- 1.5 Fault warnings and handling
 - 1.5.1 Sensor fault warning and handling
 - 1.5.2 Low battery warning and handling
- 1.6 Service life and end-of-life warning
 - 1.6.1 Service life
 - 1.6.2 End-of-life warning

2 Installation

- 2.1 Installation locations
- 2.2 Installation instructions
- 2.3 Notes for installation

3 Maintenance

- 3.1 Other gases' influence on the product
- 3.2 Cleaning and maintenance
- 3.3 Maintenance tips
- 3.4 Hazard of dismantling and repairing the alarm without authorization

4 Information about carbon monoxide

- 4.1 General carbon monoxide information
- 4.2 Possible sources of carbon monoxide
- 4.3 Symptoms of CO poisoning
- 4.4 What to do when the alarm sounds

5 Accessories list

3

1 Product features and specifications

1.1 Electric Parameters

Gas detected: carbon monoxide

Dimension: 107*77*36mm

Weight: 116g

Power: 3-AA LR6 Batteries

Low battery warning: When the voltage is less than 3.6V, low battery warning is given. The unit can still work properly for 7 days after the warning.

Battery service life: 3 years

Working condition: temperature -10°C to +45°C, 0-93% relative humidity

Quiescent current: <30uA

Alarm current: <65mA

Audible alarm: >85dB (3m from the unit)

Concentration range displayed: 10-550PPM

Accuracy of Digital Display:

A) 30PPM ±6PPM

B) 50PPM ±10PPM

C) 100PPM ±15%

D) 300PPM ±15%

Alarm response times: comply with BS EN 50291-1:2018

Condition	CO concentration	Without alarm before	With alarm before
A	27±3 PPM	120 min	—
B	55±5 PPM	90 min	90 min
C	110±10 PPM	10 min	40 min
D	330±30 PPM	—	3 min

4

Low CO concentration warning: When CO concentration is greater than 30PPM for a duration of more than 60 minutes, or when CO concentration is greater than 40PPM for a duration of more than 40 minutes, low CO concentration warning will be made.

Quit alarm condition: When CO concentration is below 40PPM, alarm will terminate automatically.

Power indicator: Flashes about every 45 seconds.

Fault warning: When a fault occurs, fault warning will be given within 3 minutes.

Suitable place: Domestic premises.

Product service life: 10 years.

Important:

After 10 years' lifetime, stop using the product for your safety and scrap it according to local laws and regulations.

1.2 Brief introduction of the product

1.2.1 Product structure

The structure of KD-218A/E is as follows:

5

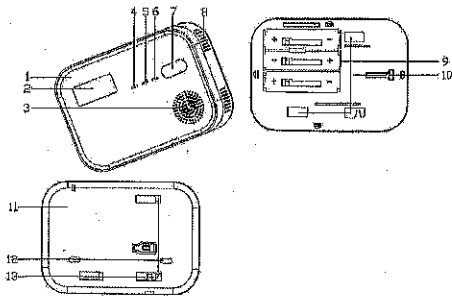


Figure 1

- 1) CO Alarm. 2) LCD display. 3) Buzzer.
 4) Power indicator. 5) Fault indicator. 6) Alarm indicator.
 7) Test button. 8) Sensor inlet. 9) Battery compartment.
 10) Mounting hole. 11) Mounting plate.
 12) Screw hole. 13) Buckle.

1.2.2 Parts function

- 1) CO Alarm: The whole product.
 2) LCD display: Show detector's parameters.
 3) Buzzer: Sounder of the detector.
 4) Power indicator: Green light that is used for power indication.

6

- 5) Fault indicator: Yellow light that is used for fault indication.
 6) Alarm indicator: Red light that is used for alarm indication.
 7) Test button: For testing and alarm silence.
 8) Sensor Inlet: Gas inlet.
 9) Battery compartment: Where to install the battery.
 10) Mounting hole: Hole for the buckle.
 11) Mounting plate: The plate that the detector is attached to for support.
 12) Screw hole: Hole for screw installation.
 13) Buckle: For attaching the detector to the mounting plate.

1.3 Information indication and power-up

1.3.1 Information indication

1.3.1.1 Information indication chart

Information	Status	Function
Power-up prompt	The Power indicator, Fault indicator and Alarm indicator will flash at the same time, and the buzzer beeps at the same time.	It indicates that the power supply is normally connected. The indicator light is on and the buzzer can sound normally, indicating that the indicator lights and buzzer are working normally, otherwise there is a fault.
Normal operation	The Power indicator flashes at least once every minute.	It indicates the detector is in normal operation.

7

Low battery warning	The Fault indicator flashes with a beep at least once every minute.	It indicates batteries need to be replaced.
Fault warning	The Fault indicator will flash twice with beeps. Fault warning will be given at least once every minute when fault is detected.	It indicates there is fault in the sensor or circuit. Fault warning will be given at least once every minute until fault is removed.
End-of-life warning	The Fault indicator will flash 3 times with beeps. The end-of-life warning will be given at least once every minute.	It indicates end of unit life.
Alarm warning	The Alarm indicator flashes 5 times with beeps. That makes one cycle of alarm. Alarm warning will be made 3 times every 10 seconds.	It indicates alarm condition and dangerous concentrations of CO is detected.
Alarm silence	When the detector is in alarm condition, press and hold the TEST button, then it will enter alarm silence condition. Alarm silence condition is the same as alarm condition except the buzzer doesn't beep	It indicates alarm condition without beeps, only when the CO concentration is less than 200PPM.

	temporarily. The Alarm indicator still flashes. Alarm silence condition lasts less than 10 minutes.	
Low CO concentration warning	The Alarm indicator will flash 4 times with beeps at a slower speed. Low CO concentration warning will be given at least once every five minutes and the interval will be at least 3 minutes.	It indicates low concentration of CO is detected.
Testing	Press the TEST button, and the Power, Fault and Alarm indicator, will flash once at the same time. If the detector is working properly, then one cycle of alarm will be made. If there is malfunction, then fault warning will be made.	For manual testing.



Battery to show
Carbon monoxide
concentration to show

LCD a screen

The LCD display can show CO concentration, battery level, fault warning, end-of-life warning, power-up prompt and testing operation.

1.3.1.3 Power-up prompt



It indicates power-up.

1.3.1.4 Battery level

- A) ENOUGH
- B) NORMAL
- C) LOW
- D) INADEQUATE

- A) Enough
- B) Normal
- C) Low
- D) Low battery warning will be made.

1.3.1.5 CO concentration

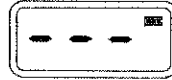


The LCD display shows CO concentration in PPM.
When CO concentration is less than 10 PPM, it shows 0 PPM.
When CO concentration is more than 550 PPM, it shows "Hco".



When CO concentration is more than 550 PPM, it is very dangerous.

1.3.1.6 Testing operation



It indicates testing is in progress.

1.3.1.7 Fault warning



It indicates fault warning.

1.3.1.8 End-of-life warning



It indicates end of unit life, and the product needs to be replaced.

1.3.1.9 Power-up prompt

When batteries are installed and the detector is powered up, power-up prompt will be given. It indicates that the power supply is normally connected, and the indicator lights and buzzer are working normally.

The LCD display shows "EN".

1.3.1.10 Battery level

When the detector is in normal operation, the Power indicator flashes every 45 seconds. If low concentration of CO is detected but alarm has not been triggered, the interval will be less than 45 seconds.

The LCD display shows battery level all the time.

1.3.1.11 Low battery warning

When the voltage is less than 3.6V, low battery warning will be given at least once every minute.

The LCD display shows condition D as specified in 1.3.1.4.

1.3.1.12 Fault warning

If there is fault in the sensor or circuit, fault warning will be given within 3 minutes. Fault warning will be made at least once every minute until the fault is eliminated.

The LCD display shows "Err" when fault warning is given.

1.3.1.13 End-of-life warning

When the detector has been working for about 10 years, end-of-life warning will be given. The product cannot be used any more.

The LCD display shows "End" when end-of-unit-life warning is given.

1.3.1.14 Alarm warning

The alarm response time of this detector complies with EN 50291. In alarm condition, at least three cycles of alarm will be made, and the interval between each cycle will be less than 10 seconds. The alarm will terminate automatically in 6 minutes when CO disappears.

1.3.1.15 Alarm silence

When the detector is in alarm condition and the CO concentration is less than 200 PPM, press and hold the TEST button and it will enter alarm silence condition. Alarm silence condition is the same as alarm condition except the buzzer doesn't beep temporarily. The Alarm indicator still flashes. Alarm silence condition lasts less than 10 minutes. Press the TEST button in alarm silence condition, and it will recover alarm condition immediately.

1.3.1.16 Low CO concentration warning

When CO concentration is greater than 30PPM for a duration of more than 60 minutes, or when CO concentration is greater than 40PPM for a duration of more than 40 minutes, low CO

concentration warning will be made every 3 to 5 minutes. The low CO concentration warning is distinctly different from alarm warning, please refer to Section 1.3.1.1.

1.3.1.17 Testing

When the detector is in normal operation, press the TEST button and testing will be conducted. If the detector is in alarm condition, it will enter alarm silence condition.

1.3.2 Power-up

This product has battery compartment with red battery pin. Use 3 replaceable AA LR6 alkaline batteries. Battery life is at least 3 years normally.

The detector will be powered on after 3 AA LR6 batteries are installed.

Press the red battery pin and install the batteries according to the polarity marks in the battery compartment.

If the power-up prompt complies with contents of Section 1.3.1, it means the buzzer and indicator lights are working normally. The detector will enter normal operation within 20 to 30 seconds after power-up.

The detector must be powered on in clean air without carbon monoxide. Otherwise, alarm warning may be given immediately.

Warning:

The detector must be powered on in clean air without carbon monoxide. Otherwise, alarm warning may be given immediately.

1.4 Operating characteristic

1.4.1 Normal operation

The detector will enter normal operation within 20 to 30 seconds after power-up. The Power indicator flashes every 45 seconds. When there is CO in the air, the Power indicator flashes every 30 seconds. The Fault indicator and Alarm indicator are off.

1.4.2 Alarm condition

The alarm response time of the detector complies with EN 50291. The alarm won't stop until CO concentration is lower than 40PPM. Put the detector in clean air, the alarm will terminate automatically in 6 minutes, or you can quit alarm condition by pressing and holding the TEST button for 1 to 3 seconds.

Important:

When you hear successive beeps, it means high concentration of CO. You and all the personnel shall leave the dangerous site at once and seek help.

1.4.3 Low CO concentration warning

In daily life, low levels of carbon monoxide can often occur. For example, cigarette smoking, burning candle and gas-burning appliances can produce low concentrations of CO. Although it may do no harm to normal people, prolonged exposure to low levels of CO can impair the health of vulnerable groups such as children, pregnant women, elderly or patients. This warning is to help these people avoid prolonged exposure to low levels of CO.

It doesn't mean a dangerous situation, so please don't be panic.

When CO concentration is greater than 30PPM for a duration of more than 60 minutes, or when CO concentration is greater than 40PPM for a duration of more than 40 minutes, low CO concentration warning will be made. The low CO concentration warning which has been specified in Section 1.3.1 is distinctly different from alarm warning:

difference	Low CO concentration warning	Alarm warning
1	The Alarm indicator flashes 4 times with beeps at a slower speed.	The Alarm indicator flashes 5 times with beeps at a faster speed.
2	Low CO concentration warning is given once every 3 to 5 minutes.	Alarm warning is given 3 times every 10 seconds.

Low CO concentration warning won't stop until CO concentration is less than 25 PPM.

Important:

If you hear 4 slower beeps every 3 to 5 minutes instead of continuous alarm sounds, it's low CO concentration warning. Don't be panic. If you continuous alarm sounds with short intervals, it's alarm warning. It is very dangerous, please leave the scene immediately.

1.4.4 Testing

Test the CO alarm at least once a week by pressing the TEST button, to make sure the sensor, buzzer and indicator lights are operating properly.

Press the TEST button, and the Power, Fault and Alarm indicators will flash once at the same time. If the detector is working properly, then one cycle of alarm will be made. If there is malfunction, then fault warning will be made.

Wait at least 5 seconds if you want to perform the test operation again.

When testing, the LCD display shows " - - - ".

Important:

Please test the product at least once a week the unit is working properly.

1.4.5 Alarm silence

When the detector is in alarm condition and the CO concentration is less than 200 PPM, press and hold the TEST button and it will enter alarm silence condition. Alarm silence condition is the same as alarm condition except the buzzer doesn't beep temporarily. The Alarm indicator still flashes. Alarm silence condition lasts less than 10 minutes. The higher the CO concentration is, the shorter the alarm silence condition lasts. When the alarm silence condition ends, and it will recover alarm condition. You can also quit alarm condition by pressing and holding the TEST button for 1 to 3 seconds. If CO disappears, it will quit alarm silence condition automatically.

Make sure you are not in a dangerous situation before alarm silence operation.

When the detector is in alarm condition, press and hold the TEST button for 3 to 5 seconds until you see the Alarm indicator flashes with no beep, then it will enter alarm silence condition. If

you press and hold the TEST button and still hear beeps, the CO concentration may be more than 200 PPM. In this case, you cannot silence the alarm.

When the detector is in alarm silence condition, press and hold the TEST button until you hear beeps, then it will recover alarm condition.

1.5 Fault warnings and handling

1.5.1 Sensor fault warning and handling

If there is fault in the sensor or circuit, fault warning will be given within 3 minutes. Fault warning will be made at least once every minute until the fault is eliminated.

When fault warning is given, there may be open circuit or short circuit in the sensor. Or there may be electronic damage. Volatile gas like ethyl alcohol may affect the sensor and cause temporary fault. In this case, please replace the product with a new one. Then power off the damaged unit and put it in clean air for 24 hours, and it will return to normal.

If the unit can't recover after being placed in clean air for 24 hours, that means permanent damage. Please don't use the product any more. Don't repair it yourself or send to the service point that is not authorized by the manufacturer.

Warning:

When the alarm is damaged permanently, please stop using it. Don't repair it yourself or send to the service point that is not authorized by the manufacturer.

1.5.2 Low battery warning and handling

When the detector is in normal operation, battery capacity is checked every minute. When the voltage is less than 3.6V, low battery warning will be given, the LCD display will show condition D as specified in Section 1.3.1.4.

When low battery warning commences, batteries are only capable of giving low battery warning for one month, or giving alarm warning for a few minutes. So please replace the AA LR6 batteries as soon as possible.

Important:

When you hear one beep every minute and see condition D on the LCD display, please replace the LR6 AA batteries immediately. Otherwise, the detector may not work properly, which will threaten your health.

1.6 Service life and end-of-life warning

1.6.1 Service life

This product has a service life of 10 years. After power-up, the product starts timing and when it reaches 10 years the unit will give end-of-life warning. You have to replace the product when this warning is given.

1.6.2 End-of-life warning

End-of-life warning will be made at least once every minute,

which has been specified in Section 1.3.1.

If the detector is powered on or off frequently, it may cause timing error. So please don't power on or off the detector frequently. And please often check the product's manufacturing date, to see whether it has expired.

Important:

When you hear three quick beeps at intervals, it means end of unit life. Please replace the product with a new one immediately.

2 Installation

2.1 Installation locations

Install the products in bedroom and living areas. You can also install them in the places where you think may have CO leakage. To make sure people can hear the alarm from all sleeping area, we suggest you install this product on each level of your home.

To avoid causing damage to the product, to prevent false alarm and to provide optimum performance, do not install the unit in the following places:

- 2.1.1 Do not install the unit in enclosure space (such as in the kitchen cabinet or behind the curtain).
- 2.1.2 Do not install the unit in the obstructive place (such as behind the furniture).
- 2.1.3 Do not install the unit on the floor or in the water channel.
- 2.1.4 Do not install near the door and window.
- 2.1.5 Do not install near fan or air conditioner.
- 2.1.6 Do not install near the vents or flues.

20

2.1.7 Do not install in areas where the temperature can easily decrease to -10°C or exceed 40°C , unless you especially need to install like this.

2.1.8 Do not install in areas where there are a lot of lampblack and dust which will block up the sensor.

2.1.9 Do not install in too damp areas.

2.1.10 Do not install near kitchen wares or cooking equipment.

2.2 Installation instructions

Install the unit where it's easy for the user to test and operate. For wall mounting, the height of installation position should be more than 1.5m. The unit should be at least 0.3m from the ceiling. Besides, the unit should keep 1.5m away from the corner, wall side and large furniture.

Steps of alarm installation

- a) Take out the mounting plate and line it with the wall in the position that you have chosen for installation. Mark the holes with a pencil dot. With the aid of your wall punch and hammer, make two holes (6mm diameter, 40mm depth) on the marked spots.
- b) Insert the two plastic anchors into the holes. Secure the mounting plate to the wall upwards by screwing.
- c) After making sure the mounting plate is secured to the wall, power on the detector and test according to 1.4.4. If the test result is normal, then slide the alarm down over the mounting plate until it snaps into place.

2.3 Notes for installation

- The detector cannot snap into place until the batteries are

21

installed correctly. Please don't force to install in avoidance of damage.

- If you install the alarm in the garage, please do not install the alarm near the exhaust port of motor vehicles. Because when your car starts, high concentration of CO will be discharged and the temporary CO that will not kill lives may cause the alarm.

Warning:

In order to ensure the product is correctly installed and used, it should be installed strictly according to this user manual or be installed by qualified professional personnel.

3 Maintenance

3.1 Other gases' influence on the product

The following gases make cause false alarm or damage the sensor:

Methane, propane, isobutane, ethylene, ethanol, alcohol, isopropanol, benzene, toluene, ethyl acetate, hydrogen, hydrogen sulfide and sulfur dioxide. Almost all the Aerosol spray, alcoholica, paint, thinner, solvent, binder, hair spray, aftershave, perfume, car exhaust (cold start) and some cleaning detergents. When the product is exposed to the gases mentioned above, it may make false alarms or be damaged permanently. When alarms are activated and you smell irritating gas, it may be false alarm because CO is colorless and odorless. Put the product in clean air, if it's still in alarm condition 30 minutes later, then that

means the product has been polluted. You should place the power-off unit in clean air for a long time. If the product can't recover 24 hours later, then it means the sensor has been damaged and please don't use the product any more.

Important:

If the product is polluted by other gases, place the power-off unit in clean air. If the product can't recover 24 hours later, please don't use the product any more.

3.2 Cleaning and maintenance

The product must be kept clean when used, or its performance will be influenced and even may cause damage to the alarm. It shall be cleaned and tested once a month in the following way.

3.2.1 Remove dust with vacuum cleaner.

3.2.2 Rub the surface with wet soft cloth which has been wringed out.

3.2.3 Press the TEST button and make sure the detector works properly, then reinstall it to use.

Don't clean the alarm with chemical like alcohol, petrol, cleanser, etc., or it may cause damage to the alarm.

Important:

Clean the product once a month. Don't clean the alarm with chemical cleanser.

3.3 Maintenance tips

- Do not spray chemical aerosol like air freshener, hair spray, perfume, insecticide or spray paint near the alarm.
- Do not paint the CO alarm. If you need to paint the wall and floor, please put the alarm into a clean plastic bag first. After the smell has been fully volatilized, install the alarm again.
- Do not block up or cover the alarm's venthole with paste adhesive or other things.
- If the detector falls on the floor, pick it up to check whether the battery is fixed well. After making sure the battery is installed well, press the TEST button again to see if the functions run well before installing it again.

3.4 Hazard of dismantling and repairing the alarm without authorization

The detector has been calibrated before leaving the factory. If you dismantle it without permission and change any component or software, it may cause false alarm or malfunction. So please don't dismantle or modify any component or program.



Warning:

Please don't dismantle or modify any component or program, or it will cause malfunction.

4 Information about carbon monoxide

4.1 General carbon monoxide information

24

Carbon monoxide is a colorless and odorless gas which can cause people to die and will engender when any combustible material burns. When burning the combustible material in the limited room, higher concentration carbon monoxide will be engendered. When people absorb a certain amount of carbon monoxide, they will die. Now many countries' Consumer Product Safety Commissions have warned the public the harm of fatal family poison gas and make the carbon monoxide poison as the first public safety problem.

4.2 Possible sources of carbon monoxide

In home, carbon monoxide may be engendered from heating and burning equipment, such as stove, water heater, fireplace, charcoal-burning grill, natural gas furnace, heating devices, microgenerator and so on. Vehicles running in attached garages can also produce CO.

When these devices are in well-ventilated condition or in normal working condition, the amount of carbon monoxide will be little and discharged quickly without doing harm to people. But when there is lack of oxygen or the burning is not sufficient, or the devices have problems, high concentration carbon monoxide will engender. Because the ventilation is not good, and the carbon monoxide is not given off quickly, the high concentration carbon monoxide will be accumulated to the extent that will harm people's health.



Warning:

The product only indicates the presence of carbon monoxide, and warns people to deal with the situation or leave. It cannot prevent CO from occurring.

25

4.3 Symptoms of CO poisoning

- Common mild symptoms:

Slight headache, nausea, vomiting, fatigue.

- Common medium symptoms

Headache, drowsiness, confusion, fast heart rate.

- Common severe symptoms:

Convulsion, unconsciousness, cardio-respiratory failure, brain injury, death.

Young children and the elderly may be more vulnerable. Please pay attention to high-risk persons because they may experience a more dangerous situation at a certain level.

If you experience even mild symptoms of CO poisoning, please consult your doctor immediately!



Warning:

The product may not prevent the chronic effects of carbon monoxide exposure. And it may not fully safeguard individuals at special risk.

4.4 What to do when the alarm sounds



Warning:

Carbon monoxide is a poisonous gas that can kill people's lives. When the product alarms, it means the carbon monoxide has been engendered and it's very dangerous.

As carbon monoxide can kill your lives, please take the following actions if the product alarms:

1) Stop using all fuel-burning appliances and ensure that they are turned off. Open doors and windows quickly. Turn on ventilation and exhaust systems.

2) Make sure all the people move to fresh air immediately. Call emergency service for help. Don't reenter the premises until the alarm stops and remains in normal condition.

3) Get medical help for anyone suffering the effects of carbon monoxide poisoning.

4) If the alarm reactivates within 24 hours, repeat above steps and call a qualified appliance technician to investigate sources of CO from fuel burning equipment and appliances, and to check if ventilation and exhaust system is working properly. If problems are identified during the inspection, stop using the equipment immediately. Let qualified appliance technician repair it.

5 Accessories list

The product leaves factory with the following accessories:

No.	Accessory Name	Quantity
1	CO alarm	1
2	Mounting plate	1

3	Screw	2
4	Plastic anchor	2
5	User manual	1

This user manual is very important for you to use the product, please read it carefully and store it well. **Our company assumes no responsibility if the product is damaged because of human factors which causes a loss.**
Thank you for purchasing our products!

Ningbo Kingdun Electronic Industry Co., Ltd.

Tel: 086-0574-62566028

Fax: 086-0574-62566029

Add: No.28 Fengyuan Road, south of economic develop area,

Yuyao city, Zhejiang P.R., China

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