



# Tetrahydrothiophene (THT) Gas Detector

## X-am 5000

### User Manual

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For your safety, please strictly follow the instructions

The use of this instrument requires full understanding and strict adherence to the instructions provided with this instrument. This instrument can only be used for the purposes specified in this manual.

## Maintenance

The maintenance time and measures described in this technical manual must be observed, and the “sensors should be carried out with the instructions of trained + D personnel.

## Accessories

Do not use accessories not listed in order information 1).

## Safe connection with electrical instruments

For instruments not mentioned in the instruction manual or this technical manual, you must consult the manufacturer or an expert before making electrical connections.

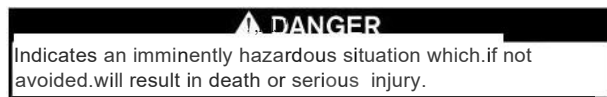
## Cautions when using in areas where there is a danger of explosion

Instruments or components used in explosive areas that have been tested and approved in accordance with national, European or international explosion-proof regulations can only be used in accordance with the conditions clearly specified in the approval, and the relevant legal provisions must be considered. No modifications to equipment or components are allowed. Prohibit the use of defective or incomplete parts. When repairing these instruments or components, always observe the corresponding regulations. Repairs to the instrument can only be carried out by trained service personnel in accordance with Dräger's safe repair instructions.

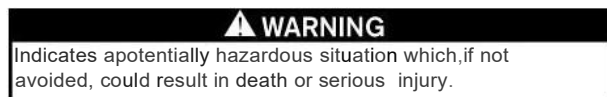
1) The technical manual, sensor data list / instruction manual and the Derger X-am 5000 computer software C C vision are included in the CD.2

## Safety symbols in the operating instructions

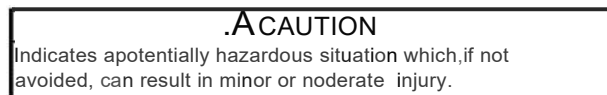
A series of warning signs are used in the instruction manual to warn the use of instruments that may cause danger. These warnings include signal words to warn you of the degree of danger you may encounter. These signals and corresponding dangers are as follows:



DANGER: Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.



WARNING: Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.



CAUTION: Indicates a potentially hazardous situation which, if not avoided, can result in minor or no injury.



NOTICE: Indicates warnings relating to property damage, not resulting in bodily injury.

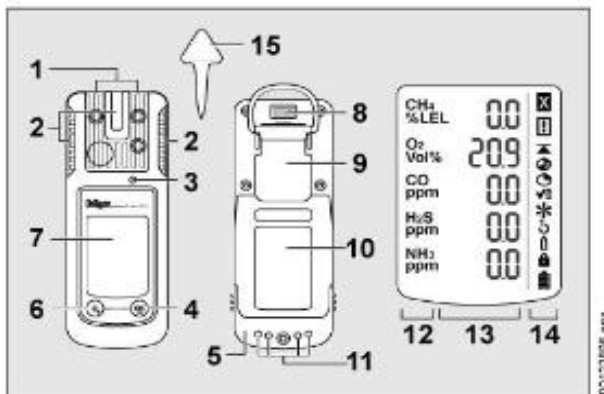
## Designed Purpose

The portable gas detection instrument can be used for continuous measurement of several gas concentrations contained in the ambient air in the work area and explosive hazardous area. After installing the Dräger sensor, the instrument can independently detect up to 5 gases.

Explosive hazardous areas by area

The instrument is designed to be divided into Zone 0, Zone 1 or Zone 2 hazardous areas or mines that are prone to A-T hospitals, and the temperature range is  $-20\text{ }^{\circ}\text{C}$  to  $+50\text{ }^{\circ}\text{C}$ , in these areas there may be IIA, IIB or IIC Explosive gas, temperature class is T3 or T4 (depending on battery pack and rechargeable battery). For 0 zone temperature class is limited to T3 If used in mines, the instrument can only be used in areas with low mechanical impact. Area explosive hazardous areas by location. The instrument is designed to be classified as a Class I or Class II hazardous area or prone to A: brittle mines with a temperature range of  $-20\text{ }^{\circ}\text{C}$  to  $+50\text{ }^{\circ}\text{C}$ . There may be A, B, C, D or E, F, G gas or dust, temperature grade is T3 or T4 (depending on battery pack and rechargeable battery).

## Parts Name



- 1 Air Inlet
- 2 Alarm LED
- 3 Buzzer
- 4 [OK] key
- 5 Battery compartment
- 6 [+] key
- 7 Screen

- 8 Infrared interface
- 9 Eel clips
- 10 Model board
- 11 Charging contacts
- 12 Measuring gas type
- 13 Measurement gas value
- 14 Special symbols
- 15 Sensor replacement tool

## Special symbols

|  |            |  |                        |  |               |
|--|------------|--|------------------------|--|---------------|
|  | Fault      |  | Function Test          |  | 100% Battery  |
|  | Warning    |  | Fresh Air Calibration  |  | 2/3 Battery   |
|  | Peak Value |  | One Key Calibration    |  | 1/3 Battery   |
|  | WTA        |  | Single Gas Calibration |  | Battery Empty |
|  | STEL       |  | Pass Code              |  |               |

## Standard device configuration

| <b>NOTICE</b>                                                                     |  |
|-----------------------------------------------------------------------------------|--|
| Only trained personnel are permitted to make changes to the device configuration. |  |

| <b>Dräger X-am<sup>®</sup> 5000<sup>1)</sup></b> |                                                                     |
|--------------------------------------------------|---------------------------------------------------------------------|
| Bump test mode <sup>2)</sup>                     | Extended bump test                                                  |
| Fresh air calibration <sup>2)</sup>              | ON                                                                  |
| Operating signal <sup>2) 3)</sup>                | ON                                                                  |
| Capture range                                    | ON                                                                  |
| Switch off <sup>2)</sup>                         | allowed                                                             |
| LEL factor <sup>2)</sup><br>(ch <sub>4</sub> )   | 4.4 (vol. %)<br>(4.4 vol. % corresponds to 100 %LEL)                |
| STEL <sup>2) 4) 5)</sup><br>(short-term average) | STEL function - disabled<br>Average value duration = 15 minutes     |
| TWA <sup>2) 5) 6)</sup><br>(shift average)       | TWA function - disabled<br>Average value duration = 8 hours         |
| Alarm A1 <sup>7)</sup>                           | can be acknowledged, non-latching, pre-alarm,<br>rising flank       |
| Alarm A1 at O <sub>2</sub> sensor <sup>7)</sup>  | cannot be acknowledged, latching, like main alarm,<br>falling flank |
| Alarm A2 <sup>7)</sup>                           | cannot be acknowledged, latching, main alarm,<br>rising flank       |

- 1) X-am<sup>®</sup> is a registered trademark of Dräger.
- 2) Different settings can be selected to meet customer requirements on delivery. The current setting can be checked and changed with the Dräger CC Vision software.
- 3) A periodic short signal indicates the operating capacity of the instrument. If there is no operating signal, correct operation cannot be guaranteed.
- 4) STEL: average value of an exposure over a short period, generally 15 minutes.
- 5) Interpretation only if the sensor is designed for this.
- 6) TWA: shift averages are workplace limit values for generally eight hours per day of exposure for five days a week during a working life.
- 7) Latching and acknowledgement of alarms A1 and A2 can be configured with the Dräger CC Vision PC software.

## First Run

Before using the instrument for the first time, insert the supplied battery or a recharged ballast hydrogen battery T4 C (Order No.: 83 18 70 4). For related information, please refer to the “Replace the Battery” chapter.

Dr. Xer X-am 5000 is ready for operation.

## Run

Turn on the instrument

- Hold down the OK button for about three seconds until the countdowns 3, 2, and 1 on the display disappear. 1. All parts that should be displayed, including audible and visual alarms and vibration alarms, are briefly activated.

One shows the software version.

One instrument performs self-test.

One displays the next sensor that needs to be calibrated and adjusted, and displays the remaining days of the next calibration and adjustment, for example, Kun E x% UEG CAL2. “. One shows the elapsed time of the functional test interval in days, for example, bt 1 23 α.

1. Display all alarm setting points A1, A2 of hydrogen sulfide and carbon monoxide, as well as ③ resistance (TW A 3)) and (S TEL3)).

1. During the warm-up period of the sensor, each measured value flashes alternately and displays a special symbol (indicating a warning). The instrument cannot issue an alarm while the sensor is warming up. Please refer to the technical manual for details on rapid warm-up.

- Press the OK button to cancel the display of the activation process.

Turn off the instrument

- Hold down the [OK] key and [+] key at the same time until the countdown “3, 2, 1” on the display disappears. 1. Before the instrument is turned off, the sound and light alarm and vibration alarm are activated briefly.

3) It is displayed only when this function is activated in the menu settings. Factory state: not turned on.

Before entering the workplace

#### A Caution

Before performing safety measurements, check the calibration and adjust if necessary.

Functional tests must be carried out in accordance with local regulations.

- Turn on the instrument. The display shows the current measured value.
- Observe whether there is any warning symbol "⚠" or fault symbol "X"
- ⚠ Field instruments can operate normally

If the warning symbol does not disappear automatically during operation, the instrument must be repaired after use. Because the instrument cannot be used for measurement, it needs to be repaired.

#### WARNING

- If the measured gas contains catalyst poisons (for example: volatile silicon, cyanide, heavy metal compounds or halogenated hydrocarbons), it can damage the catalytic combustion sensor. If the catalytic combustion sensor can no longer be marked to the target concentration, the sensor must be replaced.
- In anoxic main gas, the display of the catalytic combustion sensor may be inaccurate. The electrical operation safety (explosion protection) is not guaranteed in an oxygen-rich environment.
- Check whether the air inlet of the instrument is covered.
- 

During operation

- During operation, the measured value of each measured gas is displayed.
- If the measurement range is exceeded or a negative drift occurs, the following display will appear instead of the measured value:
- 4 Factory (concentration too high) or "L L" (negative drift) If the concentration of combustible substances is too high, it may cause hypoxia.

If the measured value is lower than the preheat alarm value (only when the measurement range is set to 100% LEL, not the measurement range > 100% LEL C heat conduction)), the oxygen concentration is less than 8Vol%, it will show that the Ex channel is faulty "Without displaying measurement information.

If an alarm occurs, the audible and visual alarms and vibration alarms are activated accordingly, see the section "Identifying Alarms".

After exceeding the measurement range, the sensitivity of the combustible gas may temporarily increase. The influence of the sensor lasts up to 4 hours. Cannot be marked again during this time rough Foot.

After the poison gas channel is over range (up to one day), there is no need to check the measurement channel.

- If using the X-am 5000 catalytic combustion sensor, under extreme influences, the zero point changes by more than 3% LEL requires fresh air calibration.

Identify the alarm

The alarm is displayed in a specific way as an image, sound or vibration.

Concentration warning A1

Alarm display through intermittent alarm information:

Alternating display of "A1" and measured value: No such display for oxygen!



The warning A1 is not a self-locking type, the alarm stops when the concentration drops below the alarm set point A1. In the case of A1, a single-frequency alarm tone can be heard, and the LED flashes.

In the case of A2, a dual-frequency alarm can be triggered, and the LED flashes twice. Confirm the warning:

- Press OK key. Only the sound and vibration alarms are turned off.

## Concentration master alarm A2

Alarm Information:

Alternative display

“A2” & measuring value:

JUL J 131\_J'

As to O2: A1=without O2

A2=O2 over



Leave this area immediately. You are in a deadly danger.  
The main\_alarm is self-locking and cannot be confirmed or  
canceled

- Leave the area, if the concentration is lower than A2
- Press OK key, the alarm information will be closed

Short-term exposure limit value STELi time weighted average TWA alarm

Alarm display through intermittent alarm information:

Alternately displays “A2” and “③” (STEL) or “@” (TW A) and measured value JUL J UL J UL

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### Caution

Leave this area immediately. After this alarm, personnel deployment depends on the corresponding national regulations.

— A short-term exposure limit value STEL and time-weighted average TWA alarm cannot be confirmed or canceled.

- Turn off the instrument. After the instrument was turned on again, the STEL short-term exposure limit was cleared.9

## Call up information mode

In measurement mode, press the [0 K] key for about 3 seconds.

1. If there are warning and fault information, the corresponding information and fault number will be displayed. (See the technical manual.) Press and hold the [OK] key to the next interface. The peak and exposure values TWA and STEL are displayed on the screen.

1. If there is no button within 10 seconds, the instrument will automatically return to the measurement mode.

### Shutdown information display mode

In the shutdown state, press the [+] key. The screen shows the gas name, measurement unit and measurement range limit value of each channel. Press the [+] key again to exit the shutdown information display mode (automatically exit without pressing the key).

### Bring up the shortcut menu

- In the measurement mode, press the [+] key three times.

1. If you have set the function of opening the shortcut menu with the computer software "CC VISION", you can select these functions with the [+] key. If the function in the shortcut menu is not activated, the instrument remains in measurement mode.

Optional functions: 1. Functional test mode

2. Fresh air calibration

3: Peak display and elimination

- Search OK key to call up the selected function.
- Press the "+" key to exit this function and switch to measurement mode.

1. If no key is pressed within 60 seconds, the instrument automatically returns to the measurement mode.

## Replace the battery

### Warning

Do not replace batteries / rechargeable batteries in hazardous areas. Risk of explosion!

The battery / rechargeable battery is part of the explosion-proof certification. Only the following types of batteries can be used:

1. Alkaline battery-T4- (cannot be charged!)

Energiser No.E91, Energiser No.EN91 (industrial), Varta Type 4106 (powerone) or Varta Type 4006 (industrial)

One town hydrogen rechargeable battery-T3-(rechargeable)

GP 1800A AHC (1800) The maximum ambient temperature is 40.

Turn off the instrument:

- Press the [OK] key [and +] key simultaneously.
- Loosen the screw on the battery compartment and remove the battery compartment. Battery compartment (order number: 8318703)
- Replace alkaline batteries or hydrogen-rechargeable batteries-ensure correct polarity. (T4 C order number of hydrogen storage battery: 8318704)
- Completely replace the battery compartment.
- Insert the battery compartment into the instrument, tighten the screws, and the instrument will automatically turn on.



Do not throw used batteries into the fire or try to force them to open. Risk of explosion! Dispose of batteries in accordance with local regulations.

## Charging of T4 instrument (8318704) with hydrogen battery compartment



Even if you do not use the instrument, we recommend that you store the instrument in the charger!

- Insert the instrument into the charger after the instrument is turned off.

— The LED on the charger lights up

 Charge

 Fault

 Full

To protect the battery life, charging can only be carried out at a temperature of 5 to 35 ° C. Exceeding this temperature range, charging will be automatically interrupted. After reaching this temperature range, charging will resume automatically. The general charging time is 4 hours. A new dart hydrogen battery can be fully charged after three load / unload cycles. If the storage device is not connected to the charging power supply, do not exceed the extended period (up to 2 months), the internal buffer battery will drain.

### Manual functional test using gas

#### Caution

Please refer to the technical manual for the description of the automatic function test of the function test station.

- Prepare a test gas cylinder, the volume flow rate must be 0.5 L / min, and the gas concentration must be greater than the alarm set point concentration to be tested.
- Connect the test cylinder to the calibration adapter (order number 83 18 752).

Do not breathe test gas. Dangerous to health!

Heed the hazard warnings on the corresponding safety data sheet.

Turn on the instrument and insert it into the standard adapter—press down until it is fully engaged.

- Open the valve of the test gas cylinder and let the test gas flow through the sensor.
- Wait until the instrument shows that the concentration tolerance of the test gas is combustible gas:  
± 20% 1)

Oxygen: ± 0.6 vol.% N

Toxic gas: ± 20% 1)

If the alarm set point is exceeded, the instrument will alternately display the gas concentration and "A1" or "A2" according to the test gas concentration.

- Close the valve of the test gas cylinder and remove the instrument from the calibration adapter. If the display exceeds the above range:
- Please ask special service personnel to calibrate the instrument.

Calibration:

Calibration may not be possible when the instrument or channel is faulty.

Perform fresh air calibration

Calibrate the instrument in fresh air without measuring gas or other interfering gases. All sensors in fresh air calibration (except Draeger "sensors xxs 0 2 and XXS

0 When using Dräger mixed gas Ci Ding No. 68 11 130), the display range should be within this range.

CO<sub>2</sub> Set to zero. For the Draeger sensor xxs 0 2 the screen display setting is 20.9vol.%, For the Draeger sensor XXS CO<sub>2</sub> is set to 0.03vol.%.

- Turn on the instrument.
- Take the [+] key three times to display the calibration symbol \*.
- Press [OK] to start the fresh air calibration function. 1 The measured value flashes

When the measured value is stable:

- Press [OK] to perform calibration.

A screen displays the current gas concentration change and “OK” appears.

• Take the [OK] key to jump out of the calibration function or wait for nearly 5 seconds. If an error occurs during fresh air calibration:

1. An error message “Yuan’p” appears and displays “•••”.

• In this case, perform fresh air calibration again. If necessary, replace the sensor with suitable personnel.

#### Calibration sheet-measuring channel sensitivity

One can calibrate the sensitivity of a sensor separately.

1. In the sensitivity calibration, the calibration concentration of the selected sensor is set to the concentration value of the test gas used. 1. Use standard test gas.

Allowable test gas concentration:

Combustible gas: 40 -100% LEL Oxygen: 10-25% vol.% Carbon monoxide: 20-999ppm Hydrogen sulfide: 5-99ppm

Test gas concentration of other gases: Refer to the instruction manual of the corresponding Dräger detection tube.

- Connect the test gas cylinder to the calibration connector.
- Connect a hose to the second connector of the calibration chamber to blow the test gas from the connector to the fume hood or outdoor.
  - Turn on the instrument and insert it into the calibration connector.
  - Press the [+] key for 5 seconds to bring up the calibration menu and enter the password (initial password 001).
  - Press the [+] key to select the single gas calibration function, the sensitivity calibration symbol flashes.
  - Press OK to start channel selection.

One flashes the gas of the first measurement channel, such as: "Ex-% LEL

Press the [OK] key to start the function test of this measurement channel, or use the "+" key to select another measurement channel (0 2-Vol%, H 2S-ppm or CO-ppm and many more).

A measurement gas concentration display

Press the [OK] key to confirm the calibration gas concentration or use the [+] key to change the calibration gas concentration and press the [OK] key to confirm and end the modification. 1 The measured value flashes.

Open the valve of the test gas cylinder and let the test gas flow through the sensor at a flow rate of 0.5 L / min. 1. The measured value flashes to the concentration value of the test gas.

When the displayed measured value is stable (after about 120 seconds):

- Press OK to confirm calibration.
1. The current measured gas concentration value and "OK" are displayed alternately.
    - Press OK to exit the calibration of the measurement channel.
    - Press OK or wait 5 seconds to complete the calibration and adjustment of the measurement channel.

The next measurement channel that needs to be calibrated may appear.

After the calibration of the last measurement channel is completed, the instrument will switch to measurement mode. Close the valve of the test gas cylinder and remove the instrument from the calibration connection.

If an error occurs during sensitivity calibration. I got wrong i Wu information

. In this case, repeat the calibration.

- If necessary, replace the sensor.

## Maintain

The instrument does not require any special maintenance.

- Dirt and deposits on the instrument can be washed with cold water. If necessary, you can use a sponge to scrub.

## Specification

Excerpt: See the technical manual 1 for details.

Ambient temperature::

Operation and record procedure      -20 to 50 °C (−20 to 40 °C suitable for 180AAHC battery)  
700 to 1300hPa

10 to 90% (instant up to 95%) rH.

IP67 (instrument with sensor)

**IP Level**                                      30cm 90dB ( A)

Operation

time                                              Standard 12 hour

Size                                              about 130 X 48 X 44mm (Height×width×length)

Weight                                              about 220 to 250g

CE Certificate                                      EMI ( **Directive 89/ 336/ EEC** )

Low voltage ( **Directive 72/ 23/ EEC** )

Certificate:                                      Exploration-prof ( **Directive 94/9/ EEC** )

## Warranty

The equipment should be inspected and repaired by corresponding qualified personnel (consult: EN 60079-2 gas measurement recommendations-selection, use and maintenance of flammable gas or toxic gas and steam detection equipment: EN 45544-4-toxic gas and steam Direct detection and direct concentration measurement of Part I: Selection guide, installation, use and maintenance, and national regulations.

Excerpt: See the sensor data list used for details

|                                                                                       | Ex                   | O2                 | H2S                  | CO                 |
|---------------------------------------------------------------------------------------|----------------------|--------------------|----------------------|--------------------|
| Measuring Theory                                                                      | catalytic combustion | Electron-chemistry | Electron-chemistry   | Electron-chemistry |
| Measurement value configuration time • • • 90s                                        |                      | ≒10s               | ≒15 s                | ≒25s               |
| Methane                                                                               | S20s                 |                    |                      |                    |
| Propane                                                                               | S35s                 |                    |                      |                    |
| Measurement time , t 0...50                                                           |                      | 6 s                | 6 s                  | 6s                 |
| Methane                                                                               | 7 s                  |                    |                      |                    |
| Propane                                                                               | 0 s                  |                    |                      |                    |
| Measuring Range                                                                       | 0 to J100 %LEL       | 0 -25 vol. %       | 0 to 2 0 0 ppmH2S7 > | 0 i W2000ppm CO8 ' |
| Methane                                                                               | 100vol. %            |                    |                      |                    |
| Zero Error (EN 45544)                                                                 |                      |                    | 2ppm                 | 6ppm               |
| warm-up                                                                               |                      |                    |                      |                    |
| time                                                                                  | 35s                  | 5 minutes          | 5 minutes            | 5 minutes          |
| Temperature                                                                           | 0.1% LEL/K           | 0.2Vol%            | no                   | ±5ppm              |
| Toxic H2S gas                                                                         | %LEL                 |                    |                      |                    |
| 10ppm halogenated hydrocarbon, heavy metal, silicon-containing gas, sulfur or polymer |                      |                    |                      |                    |
| Measuring Accuracy                                                                    | E-5                  | ≒1                 | 2-2                  | 2-2                |
| Standard                                                                              | EN 60079-29-11       | EN 50104           | EN 45544-13!         | EN 45544-13        |
| EXAM, Essen, Germany: BVS 08 ATEX002 ,                                                |                      |                    | EN 50271             | EN 50271           |
| PFG 08 G 001                                                                          |                      | EN 50271           |                      |                    |

1) The technical manual and instruction manual or data sheet using the sensor, and the CC-Vision computer software of Dräger X-am 5000 are on the CD. The instruction manual or data sheet of the sensor used can also be downloaded from the following website:  
www.draeger.com.

2) This equipment can respond to most combustible gases and steam. Its sensitivity depends on the type of gas. We recommend measuring the target gas as the calibration gas. Within the range of Anhui, the sensitivity decreases from: Jia Wan to Wang Kang.

3) The measurement signal may be increased by the influence of hydrogen sulfide or nitrogen dioxide or may be reduced by chlorine gas.

4) The measurement signal may be affected by B-fast, hydrogen or nitric oxide.

5) Reduce the concentration, the response time of the Guiyuan will be corresponding (increased to 170 seconds).

6) The LEL value of the torch from Jia burning to Gui burning is consistent with IEC60079-20.

7) 1-100ppm is certified o

8) 3-500ppm is certified.