Dräger X-am® 5000

approved as type MQG 0010

Multi-Gas Monitor

Technical Manual

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Content

For Your Safety

General safety statements
- Before using this product, carefully read the associated Instructions for Use. This document does not replace the Instructions for Use.

Definitions of alert icons
The following alert icons are used in this document to provide and highlight areas of the associated text that require a greater awareness by the user. A definition of the meaning of each icon is 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, could result in physical injury, or damage to the product or environment. It may also be used to alert against unsafe practices.

NOTICE
Indicates additional information on how to use the product.

Intended Use

Portable gas detection instrument for the continuous monitoring of the concentration of several gases in the ambient air within the working area and in explosion-hazard areas.

X-am 5000, depending on the device type and configuration of DrägerSensors: independent measurement of one up to five gases.

Tests and Approvals

Copies of the name plate and the declaration of conformity are provided in the enclosed supplementary documentation (order no. 90 33 890).
The BVS 10 ATEX E 080 X technical suitability test is based on the adjustment with the target gas.
Do not stick anything on the name plate on the gas detector.
The technical suitability tests are valid for the X-am 5000 gas detector and the calibration cradle. The explosion-protection approvals are only valid for the X-am 5000 gas detector; the calibration cradle must not be used in the Ex zone.

Intended operating area and operating conditions

Areas subject to explosion hazards, classified by zones
The instrument is intended for the use in explosion-hazard areas of Zone 0, Zone 1 or Zone 2 or in mines at risk due to fire damp. It is intended for use within a temperature range of -20 °C to +50 °C, and for areas in which gases of explosion groups IIA, IIB or IIC and temperature class T3 or T4 (depending on the batteries and rechargeable battery) may be present. If used in mines, the instrument is only to be used in areas known to have a low risk of mechanical impact.

Areas subject to explosion hazards, classified by divisions.
The instrument is intended for use in explosion-hazard areas according to Class I&II, Div. 1 or Div. 2 within a temperature range of -20 °C to +50 °C, and for areas where gases or dusts of groups A, B, C, D, E, F, G and temperature class T3 or T4 may be present (depending on the rechargeable battery and batteries).

⚠ WARNING:

CSA requirement: The sensitivity must be tested on a daily basis before first use with a known concentration of the gas to be measured in accordance with 25 to 50 % of the concentration limit value. The accuracy must be 0 to +20 % of the actual value. The accuracy can be corrected via calibration.

Safety instructions

⚠ WARNING

To reduce the danger of explosion, do not mix new batteries with old batteries and do not mix batteries made by different manufacturers.

⚠ WARNING

Always disconnect the device from the power pack before carrying out any maintenance operations.

⚠ WARNING

Substitution of components may impair intrinsic safety.

⚠ CAUTION

Not tested in an oxygen-enriched atmosphere (>21 % O_2).

⚠ WARNING

High off-scale readings may indicate an explosive concentration.

⚠ CAUTION

Use only power packs ABT 0100 (83 22 237), HBT 0000 (3703887). Check the supply unit for approved batteries and applicable temperature class.

Note the following for CSA (Canadian Standards Association) applications:

For the CSA approval only the functions of the device component that is used to measure flammable gases are tested. The device is not approved by CSA for use in mining.

⚠ WARNING:

Before daily use, test the sensitivity with a known concentration of the applicable gas corresponding to 25 to 50% of the maximum concentration. The accuracy must be within a range of 0 to +20% of the actual value. Perform a calibration to correct the accuracy if necessary.

Only applies for class II certification. CSA standard C22.2 no. 152 does not contain any requirements for class II hazard areas. Therefore this device was not tested for class II by the CSA. The sensor may become blocked and not measure the gas correctly or not warn the user that gas measurement is not possible.

⚠ WARNING

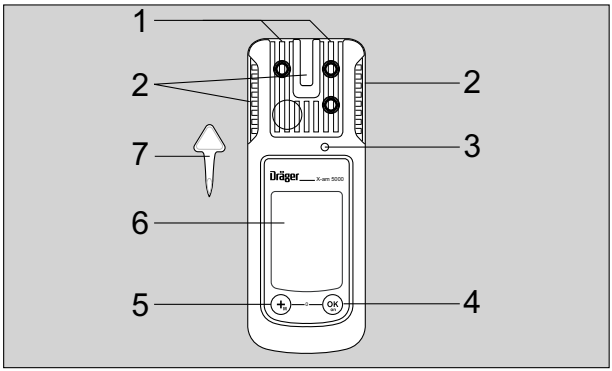
CSA requirement: Measured values over the full scale value are displayed as an explosive concentration.

NOTICE

CSA requirement: a measurement suitability test must be conducted for flammable gases.

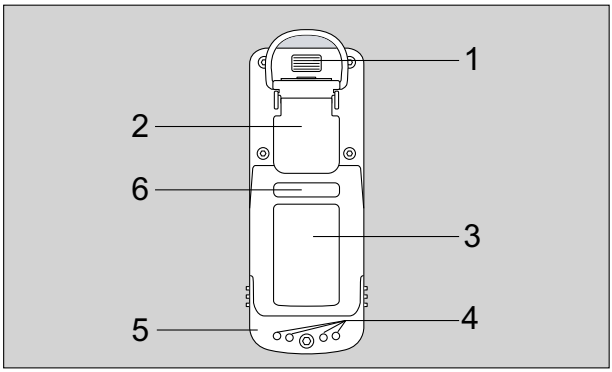
What is What

Front panel



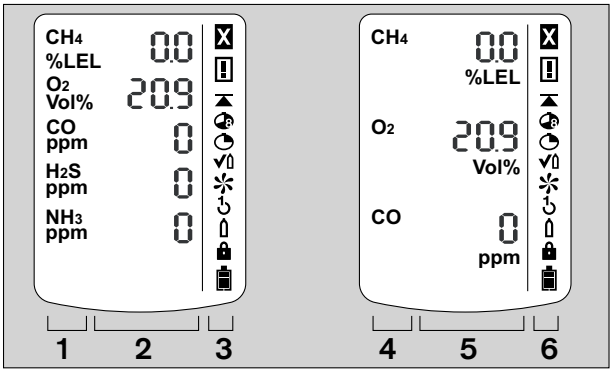
1 Gas entry
2 Alarm LED
3 Buzzer
4 ⓞ key
5 ⊕ key
6 Display
7 Tool for replacing the sensor

Rear panel



1 IR interface
2 Fastening clip
3 Type plate
4 Charging contacts
5 Power pack
6 Serial no.

Display



for 5 measuring channels only:
1 Measured gas display with unit
2 Measured value display
3 Special symbols

other:
4 Measured gas display
5 Measured gas display with unit
6 Special symbols

Special symbols

- Fault message, refer to page 15
- Warning message, refer to page 15
- The peak value display for all measuring gases, refer to page 15
- The exposure evaluation display (TWA) for measuring gases, e.g., H_2S and CO, refer to page 15
- The exposure evaluation display (STEL) for measuring gases, e.g,. H_2S and CO, refer to page 15
- The device is set to function test with gas (bump test), refer to page 38
- The device is set to the fresh air calibration function, refer to page 44
- The device is set to the 1-button calibration function, refer to page 45
- The device is set to the single gas calibration function, refer to page 48
- The function for password entry is active, refer to page 18
- Battery / rechargeable battery 100 % full
- Battery / rechargeable battery 2/3 full
- Battery / rechargeable battery 1/3 full
- Battery / rechargeable battery empty

Marking offset channels:

Feature	**Reading on the display**
ToxicTwins	HCN+
CO H_2 compensation	CO+

Configuration

Standard gas configuration

DrägerSensor	Measuring range [1]	Alarm A1 [1]			Alarm A2 [1]		
		setpoint	can be acknowledged	self-latching	setpoint	can be acknowledged	self-latching
CatEx 125 PR [%LEL]	0 to 100	20	Yes	No	40	No	Yes
CatEx 125 PR Gas [%LEL]	0 to 100	20	Yes	No	40	No	Yes
XXS O_2 [vol. %]	0 to 25	19 [2]	No	Yes	23	No	Yes
XXS O_2 100 [vol. %]	0 to 100	18.5 [2]	No	Yes	24	No	Yes
XXS O_2 / CO-LC [vol. %], [ppm]	0 to 25 O_2 0 to 2000 CO	19 O_2 30 CO	No Yes	Yes No	23 O_2 60 CO	No No	Yes Yes
XXS O_2 / H_2S-LC [Vol%], [ppm]	0 to 25 O_2 0 to 100 H_2S	19 O_2 5 H_2S	No Yes	Yes No	23 O_2 10 H_2S	No No	Yes Yes
XXS CO LC [ppm]	0 to 2,000	30	Yes	No	60	No	Yes
XXS CO-LC/H_2S-LC [ppm]	0 to 2,000 0 to 100	30 5	Yes Yes	No No	60 10	No No	Yes Yes
XXS CO-LC/O_2 [ppm], [vol.-%]	0 to 2,000 CO 0 to 25 O_2	30 CO 19 O_2	Yes No	No Yes	60 CO 23 O_2	No No	Yes Yes
XXS CO HC [ppm]	0 to 10,000	600	Yes	No	1,200	No	Yes
XXS CO H_2-CP [ppm]	0 to 2.000	30	Yes	No	60	No	Yes
XXS H_2 [ppm]	0 to 2.000	200	Yes	No	400	No	Yes
XXS H_2S LC [ppm]	0 to 100	5	Yes	No	10	No	Yes
XXS H_2S HC [ppm]	0 to 1,000	10	Yes	No	20	No	Yes
XXS H_2S-LC / CO-LC [ppm]	0 to 100 H_2S 0 to 2000 CO	5 H_2S 30 CO	Yes Yes	No No	10 H_2S 60 CO	No No	Yes Yes
XXS NO [ppm]	0 to 200	25	Yes	No	50	No	Yes
XXS NO_2 [ppm]	0 to 50	5	Yes	No	10	No	Yes
XXS SO_2 [ppm]	0 to 100	0,5	Yes	No	1	No	Yes
XXS PH_3 [ppm]	0 to 20	0.1	Yes	No	0.2	No	Yes
XXS PH_3 HC [ppm]	0 to 2,000	5	Yes	No	10	No	Yes
XXS HCN [ppm]	0 to 50	1.9	Yes	No	3.8	No	Yes
XXS HCN PC [ppm]	0 to 50	5	Yes	No	10	No	Yes
XXS NH_3 [ppm]	0 to 300	20	Yes	No	40	No	Yes
XXS CO_2 [vol. %]	0 to 5	0.5	Yes	No	1	No	Yes
XXS Cl_2 [ppm]	0 to 20	0.5	Yes	No	1	No	Yes
XXS H_2 HC [vol. %]	0 to 4	0.8	Yes	No	1.6	No	Yes

DrägerSensor	Measuring range [1]	Alarm A1 [1]			Alarm A2 [1]		
		setpoint	can be acknowledged	self-latching	setpoint	can be acknowledged	self-latching
XXS OV [ppm]	0 to 200	10	Yes	No	20	No	Yes
XXS OV A [ppm]	0 to 200	10	Yes	No	20	No	Yes
XXS Odorant [ppm]	0 to 40	10	Yes	No	20	No	Yes
XXS Amine [ppm]	0 to 100	10	Yes	No	20	No	Yes
XXS $COCl_2$ [ppm]	0 to 10	0.1	Yes	No	0.2	No	Yes
XXS O_3 [ppm]	0 to 10	0.1	Yes	No	0.2	No	Yes
XXS NO_2 LC [ppm]	0 to 50	0,5	Yes	No	1,0	No	Yes

1) 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. A version of Dräger CC-Vision suitable for the Dräger X-am 5000/2000 can be downloaded on the product page of the X-am 5000: www.draeger.com.
2) In the case of O_2 A1 is the lower alarm setpoint: an alarm is issued if the value is too low.

Standard device configuration

NOTICE
Only trained personnel are permitted to make changes to the device configuration.

Dräger X-am® 5000[1)]	
Bump test mode [2)]	Extended bump test
Fresh air calibration[2)]	ON
Operating signal [2) 3)]	ON
Capture range	ON
Switch off [2)]	allowed
LEL factor [2)] (ch_4)	4.4 (vol. %) (4.4 vol. % corresponds to 100 %LEL)
STEL [2) 4) 5)] (short-term average)	STEL function - disabled Average value duration = 15 minutes
TWA [2) 5) 6)] (shift average)	TWA function - disabled Average value duration = 8 hours
Alarm A1 [7)]	can be acknowledged, non-latching, pre-alarm, rising flank
Alarm A1 at O_2 sensor [7)]	cannot be acknowledged, latching, like main alarm, falling flank
Alarm A2 [7)]	cannot be acknowledged, latching, main alarm, rising flank

1) X-am® 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.

Changing the standard configuration: See “Configuring the Device” on page 24.

⚠ WARNING
After a basic initialization has been carried out with the PC software Dräger CC Vision, individual alarm settings may have been changed.

Selecting or disabling the capture ranges (only applies for the measuring mode):
The capture range is selected in the measuring mode (factory setting) and permanently disabled in calibration mode.
The CC-Vision PC software can be used to select or disable the capture ranges for the measuring mode.

Operation

Preparations for operation

- Before using the instrument for the first time, insert a charged NiMH T4 power pack or batteries approved by Dräger, see "Changing the batteries" on page 52.
- The instrument is now ready for operation.

⚠ WARNING

To reduce the risk of ignition of a flammable or explosive atmosphere, strictly adhere to the following warning statements:

Use only power packs of type ABT 01xx or HBT 00xx. See the marking on the rechargeable battery for permitted rechargeable batteries and the corresponding temperature class.

Substitution of components may impair intrinsic safety.

Switching on the device

- Press and hold the OK key for approx. 3 seconds until the countdown **» 3 . 2 . 1 «** shown in the display has elapsed.
  - All the display segments, including the visual, audible and vibration alarms, are activated for a short time.
  - The software version is displayed.
  - The device performs a self test.
  - The next sensor which is next due for calibration is displayed with the days remaining until the next calibration, e.g., **» Ex %LEL CAL 20 «**.
  - The time until the bump test interval elapses is displayed in days, e.g., **» bt 123 «**.
  - All A1 and A2 alarm thresholds and **»** **«** (TWA)[1] and **»** **«** (STEL)[1] for all toxic gases (e. g. H_2S or CO) are displayed consecutively.
  - During the sensor warm-up phase:
    - The display for the measured value flashes
    - The special symbol **»** **«** is displayed.
    - No alarms are issued during the warm-up phase.
    - The red LEDs flash.
    - The gas detector is ready to measure when the measured values no longer flash and the red LEDs are no longer illuminated. The special symbol **»** **«** may continue to be displayed if corresponding warnings (e.g. not yet ready for calibration) are active (to view the warnings, see the technical manual).
- Press the OK key to cancel the display of the activation sequence.

1) Only when activated in the instrument configuration. Delivery condition: not activated.

Switching off the device

- Press and hold the ⓞⓚ key and ⊕ key at the same time until the countdown **» 3 . 2 . 1 «** shown in the display has elapsed.

Before the device is switched off, the visual, audible and vibration alarms are activated for a short time.

Before entering the workplace

⚠ WARNING

Before any measurements relevant to safety are made, check the adjustment with a bump test, adjust if necessary and check all alarm elements. If national regulations apply, a bump test must be performed according to the national regulations. Faulty adjustment may result in incorrect measuring results, with possible serious consequences.

⚠ WARNING

In an oxygen enriched atmosphere (>21 vol. % O_2), the explosion protection cannot be guaranteed; remove instrument from the explosion-hazard area.

⚠ CAUTION

The CatEx sensor is intended for measurements of flammable gases and vapours mixed with air (i.e. O_2 content ≈ 21 vol.%). Incorrect measured values may be displayed in the case of oxygen deficient or oxygen enriched environments.

NOTICE

If the gas detector is used for offshore applications, a distance of 5 m to a compass must be complied with.

- Switch on the device. The current measured values are shown in the display.
- Observe any warning » ! « or fault messages » X «.
  - ! The device can be operated normally. If the warning message does not go out automatically during operation, the device must be maintained after the end of use.
  - X The device is not ready to measure and requires maintenance.

– If one of these special symbols is displayed, appropriate measures, refer to page 28 to page 31, must be taken.

- Check that the gas inlet opening on the device is not covered.

⚠ WARNING

Explosion hazard! To reduce the risk of flammable or explosive atmospheres igniting, it is essential that the warning notices below are observed:

- Fractions of catalytic poisons in the measuring gas (e.g. volatile silicon, sulphur, heavy metal compounds or halogenated hydrocarbon) can damage the Cat Ex sensor. If the CatEx sensor can no longer be calibrated to the target concentration, the sensor must be replaced.
- In case of measurements in oxygen-deficient atmosphere (<12 vol. % O_2) the CatEx sensor may show incorrect displays; in this case, a reliable measurement with a CatEx sensor is not possible.
- In an oxygen enriched atmosphere (>21 vol. % O_2), the explosion protection cannot be guaranteed; remove instrument from the Ex area.
- High values outside the display area indicate an explosive concentration where applicable.

During operation

– During operation, the measured values for every measured gas are displayed.
– In the event of an alarm, the corresponding displays, the visual, audible and vibration alarms are activated – see chapter “Identifying Alarms”.
– If a measuring range is exceeded or a negative drift occurs, the following displays are shown instead of the measured value display:

» ⌜⌜ « (concentration too high) or
» ⌞⌞ « (measuring range not reached) or
» ⌜⌟ « (blocking alarm).

– If an O2 sensor is fitted and this sensor measures an O2 concentration of below 12 vol. %, an error is indicated with » - - « on the ex-channel instead of a measured value if the measured value is below the pre-alarm threshold (not with the setting CH4 with measuring range >100 %LEL).
– After the measuring range of the TOX measuring channels has been exceeded temporarily (up to one hour), checking the measuring channels is not necessary.

In the event of an alarm, the corresponding displays, including the visual, audible and vibration alarms, are activated – see “Identifying Alarms” on page 19.

NOTICE

Special states in which there is no measuring operation (quick menu, calibration menu, warm-up of sensors, password input) are indicated by a visual signal (slow flashing of the alarm LED ⌐¬⌐¬⌐¬⌐¬).

If the measuring range is exceeded significantly on the CatEx channel (very high concentration of flammable materials), a blocking alarm is triggered. This CatEx blocking alarm can be acknowledged manually by switching the device off and back on again in fresh air.
In configuration setting CH_4 with measuring range 100 vol. %, no blocking alarm is triggered as the heat conductance measurement principle is used.

⚠ CAUTION
The measuring range 0 to 100 vol. % CH4 is not suitable for monitoring explosive mixtures in the measuring range from 0 to 100%LEL.

⚠ WARNING
If the DrägerSensor CatEx 125 PR is used in the gas detector, a zero point and sensitivity calibration must be carried out after experiencing an impact load that results in a non-zero display when exposed to fresh air. This warning does not apply if the DrägerSensor CatEx 125 PR Gas is used.

Calling the Info Mode

- In measuring mode, press the OK key for approx. 3 seconds.

If any warning or fault messages exist, the corresponding information or error codes are displayed (page 28 to page 35).
Press the OK key successively for the next display.
The peak values and the exposition values TWA[1)] and STEL[1)] are displayed.

- Warning messages are displayed. Numerical codes of warning messages: see page 28.
  OK key
- Fault messages are displayed. Numerical codes of fault messages: see page 31.
  OK key
- The peak values = the maximum measured values in the case of, e.g., CO, H_2S, ... or the minimum measured values in the case of O_2 within the storage interval are displayed
  OK key
- The average values of the exposures based on a shift of, e.g., 8 hours (TWA) of all the active sensors for the exposure evaluation are displayed
  OK key
- The short-term values (STEL) = average values of the concentrations over the average value duration of all the active sensors for the exposure evaluation are displayed
  OK key

  The device is in measuring mode again

– If no key is pressed for 10 seconds, the device returns automatically to measuring mode.

1) Only when activated in the device configuration. Delivery status: not activated.

Calling the Info-Off Mode

When the device is in a deactivated state, press the ⊕ key.
The name of the gas, measuring unit and measuring range limit value are displayed for all channels.

Pressing the OK key again exits the Info Off mode (or via timeout).

Calling the Quick Menu

– Only the fresh air calibration is activated in the quick menu on delivery. The PC software Dräger CC Vision can be used to activate the bump test for the quick menu and/or the function for displaying and deleting peak values.

• In measuring mode, press the ⊕ key three times.
If no functions have been activated in the quick menu, the device remains in measuring mode.

– You can select the activated functions of the quick menu by pressing the ⊕ key.

• Press the OK key to call the selected function.

Possible functions of the quick menu

 Bump test, refer to page 38

 Fresh air calibration, refer to page 44

 Delete peak values, refer to page 17

 Display pump information, refer to page 21

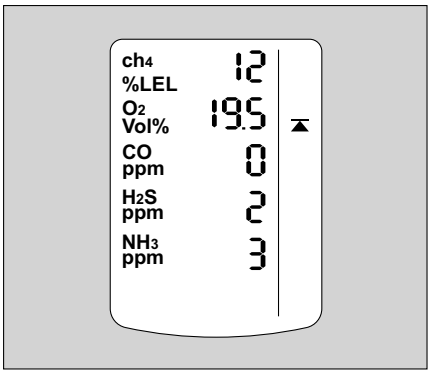
 Activate or deactivate pump, refer to page 21

• Press the ⊕ key to cancel the active function and to switch to measuring mode.

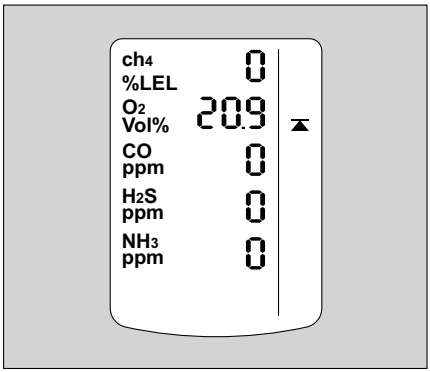
– If no key is pressed for 60 seconds, the device returns automatically to measuring mode.

Quick menu "Delete peak values"

After the function has been selected, the current peak values are displayed; the peak values special symbol appears in the display at the same time.



- The peak values can be deleted by pressing the OK key for 5 sec. The adjacent display appears.



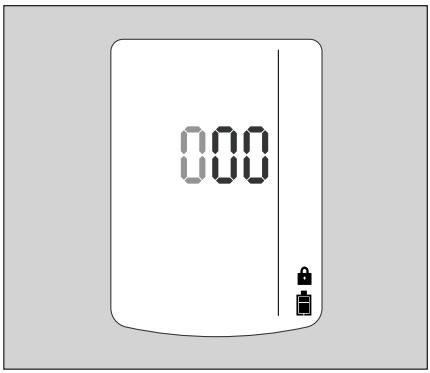
- Press the OK key to end the function.

Calling the Calibration Menu

– The calibration menu can only be accessed by entering a password. Password on delivery: **» 001 «**
– The default password on delivery can be changed using the PC software Dräger CC Vision.

• In measuring mode, press the ⊕ key for at least 4 seconds.
– The function for entering the password is selected.
– The » 🔒 « special symbol (for the "enter password" function) is displayed.

– The display shows **» 000 «**, with the first digit flashing.
• Use the ⊕ key to set the flashing digit.
• Press the OK key, the second digit starts flashing.
• Use the ⊕ key to set the flashing digit.
• Press the OK key, the third digit starts flashing.
• Use the ⊕ key to set the flashing digit.
• Press the OK key to confirm the password once it has been set completely.
– The calibration menu functions can now be selected by pressing the ⊕ key.
• Press the OK key to call the selected function.



Calibration menu functions

Fresh air calibration, refer to page 44

1-button calibration, refer to page 45

Single gas calibration, refer to page 48

• Press the ⊕ key to cancel the active function.
– If no key is pressed for 10 minutes, the device automatically returns to measuring mode.

Identifying Alarms

An alarm is displayed visually, audibly and through vibration in a specific pattern.

NOTICE
At low temperatures the legibility of the display can be improved by switching on the backlight.

Concentration pre-alarm A1

The alarm is indicated by an intermittent alarm message: 

Display **» A1 «** and measured value alternating: not for O_2!

– The pre-alarm A1 is not self-latching and stops when the concentration has dropped below the alarm setpoint A1.
– In the case of A1 a single tone is audible and the alarm LED flashes.

Acknowledging the pre-alarm:

- Press the ⓞⓚ key. Only the audible alarm and the vibration alarm are switched off.

Concentration main alarm A2

The alarm is indicated by an intermittent alarm message: 

Display **» A2 «** and measured value alternating:
In the case of A2 a double tone is audible and the alarm LED flashes twice.
For O_2:**» A1 «** and measured value alternating = oxygen deficiency
» A2 « and measured value alternating = oxygen surplus

⚠ DANGER
Leave the area immediately. Danger to life! A main alarm is self-latching and cannot be acknowledged or cancelled.

After leaving the area, if the concentration is less than the alarm setpoint A2:

- Press the ⓞⓚ key. The alarm messages are switched off.

If the measuring range is exceeded significantly on the CatEx channel (very high concentration of flammable materials), a blocking alarm is triggered. This CatEx blocking alarm can be acknowledged manually by switching the device off and back on again in fresh air.
In configuration setting CH_4 with measuring range 100 vol. %, no blocking alarm is triggered as the heat conductance measurement principle is used.

⚠ CAUTION
The measuring range 0 to 100 vol. % CH_4 is not suitable for monitoring explosive mixtures in the measuring range from 0 to 100 %LEL.

STEL / TWA exposure alarm

The alarm is indicated by an intermittent alarm message:

Display **» A2 «** and **»**  **«** (TWA) or **»**  « (STEL) and measured value alternating:

⚠ CAUTION
Health hazard! Leave the area immediately. After this alarm, the deployment of personnel is subject to the relevant national regulations.

– STEL and TWA alarms cannot be acknowledged or canceled.
• Switch off the device. The values for the exposure evaluation are deleted after the device is switched on again.

NOTICE
The STEL alarm can be triggered with a maximum delay of one minute.

Battery pre-alarm

The alarm is indicated by an intermittent alarm message:

Flashing special symbol **»**  **«** on the right side of the display:

Acknowledging the pre-alarm:
• Press the  key. Only the audible alarm and the vibration alarm are switched off.
– The battery still lasts approx. 20 minutes after the first battery pre-alarm.

Battery main alarm

The alarm is indicated by an intermittent alarm message:

Flashing special symbol **»**  **«** on the right side of the display:

The battery main alarm cannot be acknowledged or canceled:
– The device is automatically switched off again after 10 seconds.
– Before the device is switched off, the visual, audible and vibration alarms are activated for a short time.

Device alarm

The alarm is indicated by an intermittent alarm message:

Special symbol »  « on the right side of the display:

– The device or one or several sensor channels are not ready for operation.
– For remedies, refer to page 28 to page 35.
• If necessary, commission the Dräger Service Center to eliminate the error.

Operation with pump

Observe the following when performing measurements using the pump
- Perform visual inspection of the probe, if necessary.
- Wait for the flushing time to end.
  Flush the Dräger sampling hose or Dräger probes prior to each measurement with the air sample to be measured.

The flushing phase is necessary to minimize or eliminate any effects associated with the use of a sampling hose or a probe, e.g. memory effects, dead volume.
The duration of the flushing phase depends on factors such as type and concentration of the gas or vapour to be measured, material, length, diameter and age of the sampling hose or probe. As a rule of thumb, a typical flushing time of 3 seconds per metre can be assumed for a sampling hose (factory-new, dry, clean). This flushing time applies in addition to the sensor response time (see instructions for use of the gas detector used).

Example:
The flushing time for a 10 m hose is approx. 30 seconds. The sensor response time is approx. 60 seconds in addition. The overall time before reading the gas detector therefore is approx. 90 seconds.
The flow alarm is delayed by 10 to 30 seconds, depending on the hose length.

Performing a measurement with Dräger Pump X-am 1/2/5000
Required accessories (siehe “Accessories” auf Seite 63):
- Dräger Pump X-am 1/2/5000
- Sampling hose and probes

Commissioning and performing the measurement:
- See instructions for use of Dräger Pump X-am 1/2/5000.

Performing a measurement with the Dräger X-am Pump
Required accessories (siehe “Accessories” auf Seite 63):
- Dräger X-am Pump
- Sampling hose and probes

Pump symbols:


Pump battery 100 % charged


Remaining charge of pump battery: 2/3


Remaining charge of pump battery: 1/3


Pump battery discharged


Warning for pump
(Gas detector can no longer detect pump.)


Leak test:
Block suction inlet


Leak test:
Release suction inlet

Commissioning and performing the measurement:
- See instructions for use of the Dräger X-am Pump.

Viewing pump information:
- Open the quick menu (siehe “Calling the Quick Menu” auf Seite 16).
- Select and confirm with the ⓞⓚ button.

The following pump information will be displayed:
— serial number
— pump runtime (current operation)
— pump battery charge
- Press the ⊕ button to return to measuring mode.

Activating or deactivating the pump:
- Open the quick menu (siehe “Calling the Quick Menu” auf Seite 16).
- Select or and activate or deactivate the pump by pressing the ⓞⓚ button.
- Press the ⊕ button to return to measuring mode.

⚠ WARNING

No measurement!
If the pump is connected but deactivated, the gas detector is not ready to measure.
The red LEDs on the gas detector flash.

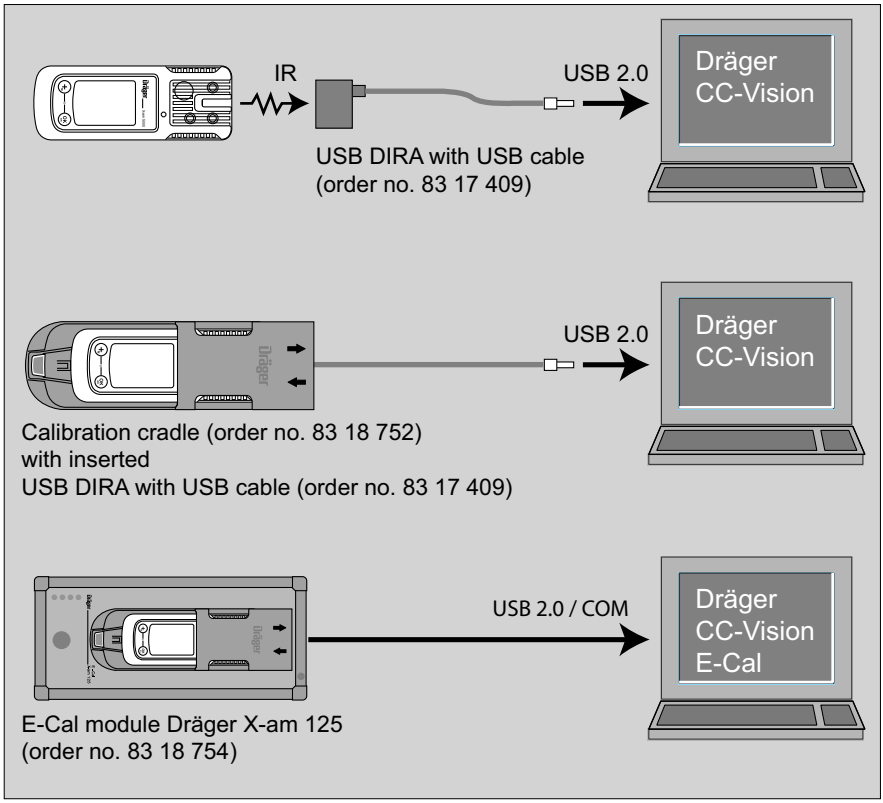
⚠ WARNING
Impairment of accuracy! After measuring high concentrations of nonane (>20 %LEL), the accuracy for measuring nonane is impaired. The pump is not suitable for long-term measurement of high concentrations of nonane.

Performing a measurement with a manual pump adapter and rubber ball pump
Required accessories (siehe “Accessories” auf Seite 63):
- Manual pump adapter
- Rubber ball pump
- Sampling hose
- Probes

Commissioning and performing the measurement:
- See instructions for use of the accessories used.

Configuring the Device

To individually configure a device with standard configuration, the device must be connected with a PC.



The installed PC software Dräger CC Vision is used for configuration.

- Observe the documentation and online help of the software.

– A version of Dräger CC-Vision which can be used for Dräger X-am 5000 can be downloaded from the following web address: www.draeger.com/software.

Dräger recommends protecting the configuration software for the gas detector (e.g. Dräger CC-Vision) against unauthorised access by setting a password as part of user administration.
The password should be changed regularly to ensure protection against unauthorised access.

Device settings

NOTICE
To ensure compliance with EN 50271, it is necessary to check the transferred parameters when changes are made to the configuration. Only trained and competent users are permitted to change the instrument configuration.

The following changes can be made to the device parameters for a device:

Designation	**Field**
Password	Numeric field (3-figure)
Operating signal LED [1)]	Yes/No
Operating signal horn[1)]	Yes/No
Switch-off mode	“Switch off permitted” or “Switch off prohibited” or “Switch off prohibited at A2”
Shift length (TWA) [2)] (in minutes)	60 - 14400 (setting for exposure alarm)
Short-term exposure limit (STEL) [3) 4)] (in minutes)	0 - 15 (setting for exposure alarm)
User ID(12 characters)	Alphanumeric field
Switch database on or off	On/Off
Overwrite database	Yes/No
Database mode	Peak/Average
Database interval	1 s / 10 s / 30 s / 1 min / 2 min / 5 min / 10 min / 30 min
Date	(date on the PC)
Time	(time on the PC)
Warning after expiry of calibration interval	Yes/No
Error after expiry of calibration interval	Yes/No
Delay until error after expiry of calibration interval (days)	0 - 10
Automatic detection of Bump Test Station	Yes/No
Activate sensitivity calibration following negative bump test	Yes/No (relates only to a device connected to the Dräger Bump Test Station)
Bump test mode	“extended bump test” or “quick bump test” or “bump test deactivated”
Warning after expiry of bump test interval	Yes/No
Error after expiry of bump test interval (if warning activated)	Yes/No
Capture range	Yes / No

Designation	Field
Remote configuration	Yes / No
Bump test interval (days)	1 - 732
Delay until error after expiry of cal. interval (days)	0 - 10
Activate user service life	Yes/No
User service life (days) (if activated)	0 - 999
Running in	Yes/No
LEL category	"---" or "PTB" or "IEC" or "NIOSH" (if this is changed, the LEL factor will be altered to match)

1) At least one of the two operating signals must be switched on.
2) Corresponds to the averaging time and is used to calculate the exposure value TWA.
3) Only evaluated if the sensor is provided for the purpose.
4) Corresponds to the averaging time and is used to calculate the exposure value STEL.

Sensor settings
The following changes can be made to the sensor parameters for the sensors:

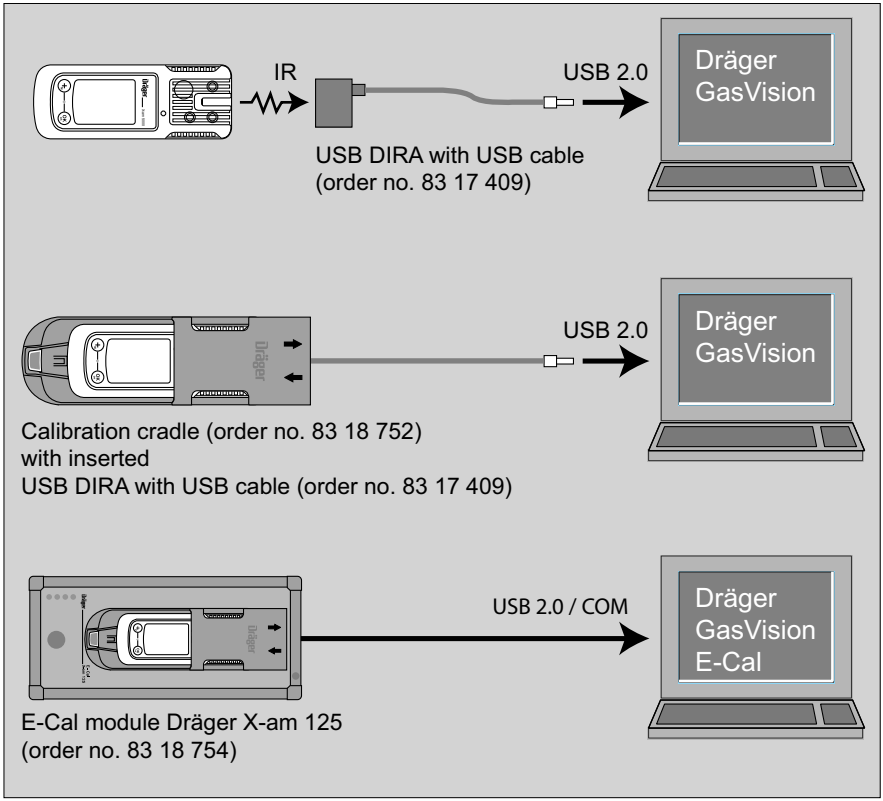
Designation	Field
Alarm threshold A1 (in measurement unit)	0 - A2
Alarm threshold A2 (in measurement unit)	A1 – Measuring range limit value
Type of evaluation[1)]	Inactive, TWA, STEL, TWA+STEL
Alarm threshold STEL (in measurement unit)[1)]	0 – Measuring range limit value
Alarm threshold TWA (in measurement unit)[1)]	0 – Measuring range limit value
Calibration interval (days)	0 - 180 (sensor-dependent)
Unit (sensor-dependent)	Vol%, %UEG, %LEL, %LIE, ppm, mbar, ppb, mg/m^3
Gas name: "Ex" (CatEx sensor only)	Yes/No
Automatic fresh air calibration in the charging cradle (CatEx sensor only)	Yes / No
ToxicTwins (HCN)	Yes/No

1) Only evaluated if the sensor is provided for the purpose.

Testing the parameters
In order to ensure that the values have been correctly transferred to the gas measuring device:
- Press the touch button **Data from X-am 1/2/5x00**
- Check parameters.

Read Database and Display Graphically

To read the database of the device and display it graphically, the device must be connected with a PC.



The installed PC software Dräger GasVision is used for reading and displaying the database.

- Observe the documentation and online help of the software.

Faults, Cause and Remedy

Fault	Cause	Remedy
Not possible to switch on the device	Discharge the power pack	Charge the power pack, page 53.
	Discharge the alkaline batteries	Insert new alkaline batteries, page 52.
Not possible to switch off the device	The device is not set to measuring mode	Select measuring mode.
	The device is configured to "Disable prohibited"	Configure the device to "Disable allowed" with Dräger CC Vision.
Display **» – – «**	Measuring range calibrated incorrectly	Recalibrate the measuring range, page 43.
	Electronics or sensors defective	Must be repaired by DrägerService.

To display the numerical codes of the warning and fault messages in the info mode, page 15.

Warning messages

Special symbol » ⚠ « and displayed numerical code:	Cause	Remedy
152	Customer's service life counter about to elapse	Reset the service life counter using Dräger CC Vision.
153	Database 90 % full	Read the database soon and clear memory afterwards.
154	Database full	Read the database and clear memory.
155	Interval for the function test with gas (bump test) elapsed	Carry out the function test, page 38.
156	Battery pre-alarm of X-am Pump	Recharge the battery soon. The battery will last for at least 20 minutes after the first battery pre-alarm.
159	Calibration not possible. The menu function cannot be carried out because of a message which is preventing the function (e.g., sensors in warm-up phase).	Determine the message code via the info menu and switch it off, if necessary.

Special symbol » ! « and displayed numerical code:	Cause	Remedy
251	DrägerSensor CatEx 125 PR in warm-up phase	Wait until warm-up time is complete.
252	DrägerSensor CatEx 125 PR in warm-up phase	Wait until warm-up time is complete.
253	Ex concentration has drifted into the negative range	Carry out fresh air calibration, page 44.
254	The temperature is too high	Operate the device within the allowed temperature range.
255	The temperature is too low	Operate the device within the allowed temperature range.
256	The calibration interval for DrägerSensor CatEx 125 PR has elapsed	Carry out span calibration for DrägerSensor CatEx 125 PR, page 48.
257	Alarm setpoint A2 setting is greater than 60 %LEL	Set alarm setpoint to less than 60 % LEL.
271	The calibration interval for thermal conduction for DrägerSensor CatEx 125 PR has elapsed	Carry out span calibration for DrägerSensor CatEx 125 PR, page 48.
272	Sensor is switched off due to excess gas	Restart the device
351	DrägerSensor XXS EC1 in the warm-up phase	Wait until warm-up time is complete.
352	DrägerSensor XXS EC1 in the warm-up phase	Wait until warm-up time is complete.
353	EC1 concentration has drifted into the negative range	Carry out fresh air calibration, page 44.
354	The temperature is too high	Operate the device within the allowed temperature range.
355	The temperature is too low	Operate the device within the allowed temperature range.
356	The calibration interval for DrägerSensor XXS EC1 has elapsed	Carry out span calibration for DrägerSensor XXS EC1, page 48.
357	Alarm setpoint A2 setting is greater than 60 %LEL	Set alarm setpoint to less than 60 %LEL.
451	DrägerSensor XXS EC2 in the warm-up phase	Wait until warm-up time is complete.
452	DrägerSensor XXS EC2 in the warm-up phase	Wait until warm-up time is complete.
453	EC2 concentration has drifted into the negative range	Carry out fresh air calibration, page 44.

Special symbol » ⚠ « and displayed numerical code:	Cause	Remedy
454	The temperature is too high	Operate the device within the allowed temperature range.
455	The temperature is too low	Operate the device within the allowed temperature range.
456	The calibration interval for DrägerSensor XXS EC2 has elapsed	Carry out span calibration for DrägerSensor XXS EC 3, page 48.
457	Alarm setpoint A2 setting is greater than 60 %LEL	Set alarm setpoint to less than 60 %LEL.
551	DrägerSensor XXS EC3 in the warm-up phase	Wait until warm-up time is complete.
552	DrägerSensor XXS EC3 in the warm-up phase	Wait until warm-up time is complete.
553	EC3 concentration has drifted into the negative range	Carry out fresh air calibration, page 44.
554	The temperature is too high	Operate the device within the allowed temperature range.
555	The temperature is too low	Operate the device within the allowed temperature range.
556	The calibration interval for DrägerSensor XXS EC3 has elapsed	Carry out span calibration for DrägerSensor XXS EC 3, page 48.
557	Alarm setpoint A2 setting is greater than 60 %LEL	Set alarm setpoint to less than 60 %LEL.
575	Calibration interval for the compensation channel has elapsed	Adjust the sensitivity of the compensation channel.
576	Calibration required because of overgassing.	Adjust the sensitivity of the compensation channel.
651	DrägerSensor XXS EC 4 in the warm-up phase	Wait until warm-up time is complete.
652	DrägerSensor XXS EC 4 in the warm-up phase	Wait until warm-up time is complete.
653	EC 4 concentration has drifted into the negative range	Carry out fresh air calibration, page 44.
654	The temperature is too high	Operate the device within the allowed temperature range.
655	The temperature is too low	Operate the device within the allowed temperature range.

Special symbol » ! « and displayed numerical code:	Cause	Remedy
656	The calibration interval for DrägerSensor XXS EC 4 has elapsed	Carry out span calibration for DrägerSensor XXS EC 4, page 48.
657	Alarm setpoint A2 setting is greater than 60 %LEL	Set alarm setpoint to less than 60 %LEL.

Fault messages

Special symbol » X « and displayed numerical code:	Cause	Remedy
102	The customer's service life counter has elapsed	Reset the service life counter using Dräger CC Vision.
103	The device is defective	The device must be repaired by DrägerService.
104	Check sum error program code	The device must be repaired by DrägerService.
105	The bump test interval has elapsed	Carry out bump test, page 41.
106	The calibration interval has elapsed (at least 1 calibration interval has elapsed)	Carry out span calibration, page 45 or page 48.
107	Bump test error (at least 1 channel has a bump test error)	Carry out bump test, page 41 or carry out span calibration, page 45 or page 48.
108	The device is defective	The device must be repaired by DrägerService.
109	The menu function cannot be carried out because of an error.	Determine the error code via the info menu and switch it off, if necessary.
111	Failed alarm element test: alarm light.	Repeat alarm element test with Dräger X-dock.
112	Failed alarm element test: alarm horn.	Repeat alarm element test with X-dock.
113	Failed alarm element test: Vibration motor.	Repeat alarm element test with X-dock.
114	Defective parameter check	Correct parameters and repeat test using X-dock
115	Device is disabled by X-dock.	Activate device with X-dock.
116	Failed software update.	The device must be repaired by DrägerService.

Special symbol » X « and displayed numerical code:	Cause	Remedy
117	User parameters not feasible	Check configuration of user parameters and adjust
118	Flow alarm of X-am Pump	Check the gas circuit for obstructions and replace filters if necessary.
121	Overvoltage on X-am Pump	Contact DrägerService.
122	Battery main alarm of X-am Pump	Charge pump.
201	The zero point calibration of DrägerSensor CatEx 125 PR is not valid	Carry out fresh air calibration, page 44.
202	The span calibration of DrägerSensor CatEx 125 PR is not valid	Carry out span calibration, page 45 or page 48.
203	The measurement value of DrägerSensor CatEx 125 PR is in the negative range	Carry out fresh air calibration, page 44.
204	DrägerSensor CatEx 125 PR is not inserted or defective	Check DrägerSensor CatEx 125 PR, page 56.
205	Error during the function test with gas (bump test) of DrägerSensor CatEx 125 PR	Repeat the function test. Calibrate or replace DrägerSensor CatEx 125 PR, if necessary page 56.
207	Failed rise time test.	Repeat rise time test with X-dock.
208	User parameters not feasible	Check configuration of user parameters and adjust
218	Blocking alarm not plausible.	Adjust the sensor.
221	DrägerSensor CatEx 125 PR cannot be operated due to oxygen deficiency	Use in the sensor in an environment containing at least 12 vol. % O_2.
222	No valid zero point calibration of DrägerSensor CatEx 125 PR for thermal conduction	Carry out fresh air calibration, page 44.
223	No valid span calibration of DrägerSensor CatEx 125 PR for thermal conduction	Carry out span calibration for thermal conduction, page 45 or page 48.
224	Device incorrectly configured by Dräger CC-Vision.	Change sensor for applicable channel with Dräger CC-Vision.

Special symbol » X « and displayed numerical code:	**Cause**	**Remedy**
301	The zero point calibration of DrägerSensor XXS EC1 is not valid	Carry out fresh air calibration, page 44.
302	The span calibration of DrägerSensor XXS EC1 is not valid	Carry out span calibration. Carry out page 48 or fresh air calibration, page 44.
303	The measured value of DrägerSensor XXS EC 1 is in the negative range	Carry out fresh air calibration, page 44.
304	DrägerSensor XXS EC1 is not inserted or defective	Check DrägerSensor XXS EC1, page 56.
305	Error during the function test with gas (bump test) of DrägerSensor XXS EC1	Repeat function test. Calibrate or replace DrägerSensor XXS EC1, if necessary page 56.
307	Failed rise time test.	Repeat rise time test with X-dock.
308	User parameters not feasible	Check configuration of user parameters and adjust
324	Device incorrectly configured by Dräger CC-Vision.	Change sensor for applicable channel with Dräger CC-Vision.
326	Error during warm-up acceleration Dräger Sensor XXS EC1	Disconnect and reconnect power pack or replace the sensor. Sensor must not be loaded with gas within the first 5 minutes.
401	The zero point calibration of DrägerSensor XXS EC2 is not valid	Carry out fresh air calibration, page 44.
402	The span calibration of DrägerSensor XXS EC2 is not valid	Carry out span calibration, page 48.
403	The measured value of DrägerSensor XXS EC 2 is in the negative range	Carry out fresh air calibration, page 44.
404	DrägerSensor XXS EC2 is not inserted or defective	Check DrägerSensor XXS EC2, page 56.
405	Error during the function test with gas (bump test) of DrägerSensor XXS EC2	Repeat function test. Calibrate or replace DrägerSensor XXS EC2, if necessary page 56.
406	Failed filter test.	Repeat filter test with X-dock.
407	Failed rise time test.	Repeat rise time test with X-dock.

Special symbol » X « and displayed numerical code:	**Cause**	**Remedy**
408	User parameters not feasible	Check configuration of user parameters and adjust
424	Device incorrectly configured by Dräger CC-Vision.	Change sensor for applicable channel with Dräger CC-Vision.
426	Error during warm-up acceleration Dräger Sensor XXS EC2	Disconnect and reconnect power pack or replace the sensor. Sensor must not be loaded with gas within the first 5 minutes.
501	The zero point calibration of DrägerSensor XXS EC3 is not valid	Carry out fresh air calibration, page 44.
502	The span calibration of DrägerSensor XXS EC3 is not valid	Carry out span calibration, page 48.
503	The measured value of DrägerSensor XXS EC3 is in the negative range	Carry out fresh air calibration, page 44.
504	DrägerSensor XXS EC3 is not inserted or defective	Check DrägerSensor XXS EC3, page 56.
505	Error during the function test with gas (bump test) of DrägerSensor XXS EC3	Repeat function test. Calibrate or replace DrägerSensor XXS EC3, if necessary page 56.
506	Failed filter test.	Repeat filter test with X-dock.
507	Failed rise time test.	Repeat rise time test with X-dock.
508	User parameters not feasible	Check configuration of user parameters and adjust
524	Device incorrectly configured by Dräger CC-Vision.	Change sensor for applicable channel with Dräger CC-Vision.
525	The span calibration for the compensation channel is not valid	Carry out span calibration for compensation electrode.
526	Error during warm-up acceleration Dräger Sensor XXS EC3	Disconnect and reconnect power pack or replace the sensor. Sensor must not be loaded with gas within the first 5 minutes.

Special symbol » X « and displayed numerical code:	**Cause**	**Remedy**
601	The zero point calibration of DrägerSensor XXS EC4 is not valid	Carry out fresh air calibration, page 44.
602	The span calibration of DrägerSensor XXS EC4 is not valid	Carry out span calibration, page 48.
603	The measured value of DrägerSensor XXS EC4 is in the negative range	Carry out fresh air calibration, page 44.
604	DrägerSensor XXS EC4 is not inserted or defective	Check DrägerSensor XXS EC4, page 56.
605	Error during the function test with gas (bump test) of DrägerSensor XXS EC4	Repeat function test. Calibrate or replace DrägerSensor XXS EC 4, if necessary page 56.
606	Failed filter test.	Repeat filter test with X-dock.
607	Failed rise time test.	Repeat rise time test with X-dock.
608	User parameters not feasible	Check configuration of user parameters and adjust
624	Device incorrectly configured by Dräger CC-Vision.	Change sensor for applicable channel with Dräger CC-Vision.
626	Error during warm-up acceleration Dräger Sensor XXS EC4	Disconnect and reconnect power pack or replace the sensor. Sensor must not be loaded with gas within the first 5 minutes.

Maintenance

Maintenance intervals

The device should be inspected and maintained by suitably qualified persons annually.
Comparisons:
- EN 60079-29-2 – Gas detectors - Selection, installation, use and maintenance of detectors for flammable gases and oxygen
- EN 45544-4 – Electrical apparatus used for the direct detection and direct concentration measurement of toxic gases and vapours - Part 4: Guide for selection, installation, use and maintenance
- National regulations

Recommended calibration interval for measuring channels Ex, O_2, H_2S, SO_2, NO_2 and CO: 6 months.
Calibration interval of other gases: refer to the Instructions for Use of the respective DrägerSensors.

- Depending on device configuration:
  Replace the alkaline batteries or charge the battery – refer to page 52 to page 53 – after each use, at the latest after the battery alarm has been triggered or after 2 weeks.

- Calibrating the device – page 43.
  – In regular intervals, according to the sensors used and the operating conditions. For sensor-specific calibration data, refer to the Instructions for Use/data sheets of the sensors used[1)].
  – Before you carry out safety-related relevant measurements, the zero point and sensitivity of the devices should be tested in accordance with national regulations.

- Inspection by suitably qualified persons – every year.
  – The inspection intervals must be established in each individual case and shortened if necessary, depending on technical safety considerations, engineering conditions and the technical requirements of the equipment.
  – We recommend that a service agreement be concluded with Dräger and that repairs also be carried out by them.

- Replace the sensors, page 56 – if necessary, when it is not possible to calibrate the sensors anymore.

1) Instructions for Use/data sheets for DrägerSensors can be downloaded on the product page of the X-am 5000 at the following Internet address: www.draeger.com. See also the enclosed Instructions for Use and data sheets for the sensors used.

ToxicTwins

When the ToxicTwins feature is activated, the measuring channels of the XXS CO sensor and the XXS HCN sensor are offset against each other in such a manner that the device issues an alarm before the respective A1 alarm threshold is reached if both gases are detected at the same time.

Prerequisites:
— The XXS CO and XXS HCN sensors are installed.
— The ToxicTwins feature is activated (using the Dräger CC-Vision PC software).

If the ToxicTwins feature is activated, HCN+ appears in the measured value display.

CO H_2 compensation

Carbon monoxide (CO) and hydrogen (H_2) can occur simultaneously in workplaces in the steel industry, refineries, sewage works, etc. Hydrogen affects the CO signal in ordinary commercially available sensors, which leads to false alarms. The XXS CO H_2-CP sensor uses two sensing electrodes. One of these electrodes measures CO and H_2, the other one measures only H_2. The difference between the two signals is calculated, so that only the CO value will be displayed. For example, a hydrogen concentration of 1000 ppm (2.5 %LEL) will only result in a maximum of 15 ppm CO being displayed, but the CO alarm will not be triggered.

This feature is automatically available and activated if the XXS CO H_2-CP sensor is installed. Deactivation is not possible.

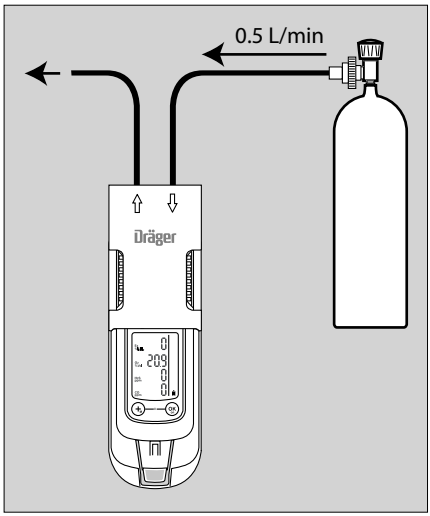
Prerequisites:
— XXS CO H_2-CP sensor is installed.

If this feature is used, CO+ appears in the measured value display.

Carry out manual bump test

Manual implementation without the documentation of results in the device memory

- Prepare a test gas cylinder, the volume flow must be 0.5 L/min and the gas concentration must be higher than the alarm setpoint concentration to be tested.
  Example test gas cylinder 68 11 130 = mixed gas with 50 ppm CO, 15 ppm H_2S, 2.5 vol. % CH_4, 18 vol. % O_2
- Connect the test gas cylinder with the calibration cradle (83 18 752).
- Vent the test gas into a fume cupboard or into the open air (with a hose connected to the second connector of the calibration cradle).



⚠ CAUTION

Health hazard! Do not inhale the test gas. Risk to health! Observe the hazard warnings of the relevant Safety Data Sheets.

⚠ WARNING

CSA requirement: carry out a bump test before use. It should be carried out in the measuring range 25-50 % of the full scale value, whereby the displayed measured value may deviate from the actual measured value by 0-20 %. Accuracy may be corrected via calibration.

- Switch on the device and insert it into the calibration cradle – press downwards until it engages.
- Open the test gas cylinder valve to let test gas flow over the sensors.
- Recommendation: Wait until the device displays the test gas concentration with sufficient tolerance –
  Ex: ±20% of the test gas concentration [1)]
  O_2: ±0.6 vol. % [1)]
  TOX: ±20% of the test gas concentration [1)].
  Wait al least until the alarm setpoint A1 or A2 is exceeded.
- If the alarm setpoints are exceeded, the device displays the gas concentration in alternation with **» A1 «** or **» A2 «** depending on the test gas concentration.
- Close the test gas cylinder valve and remove the device from the calibration cradle

– If the concentration has now fallen under the A1 alarm setpoint:

- Acknowledge the alarm.
- If the displays are outside of the above-mentioned ranges:

1) Upon application of the Dräger mixed gas (order no. 68 11 130) the displays should be within this range.

- Calibrating the device, refer to page 43.

NOTICE
To check the measured value response times, apply t90 test gas to the X-am via the calibration cradle. Check the results in accordance with the information in the table in the enclosed supplementary documentation (order no. 90 33 890) until 90 % of the end display is reached.

NOTICE
After the bump test, the display shows a printer icon even if there is no printer connected to the bump test station.

Menu implementation with the documentation of results in the device memory

The "Quick bump test" or the "Extended bump test" is selected using the Dräger CC Vision PC software. The "Quick bump test" checks whether the gas concentration has exceeded the Alarm 1 threshold (with oxygen, the check is whether the concentration has fallen below the Alarm 1 threshold). In the case of the “Extended bump test”, a check is made as to whether the gas concentration has reached the set bump test concentration within a tolerance window.

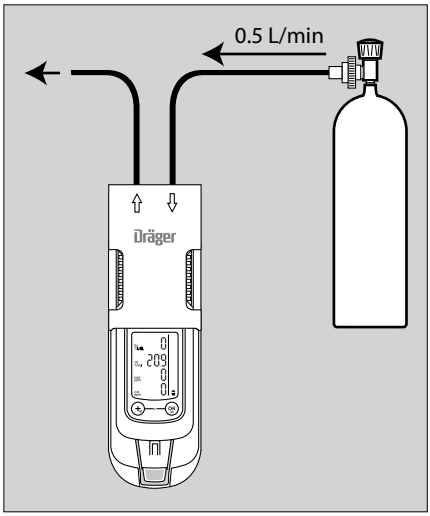
Setting on delivery: Extended bump test.

- Prepare a test gas cylinder, the volume flow must be 0.5 L/min and the gas concentration must be higher than the alarm setpoint concentration to be tested. Example test gas cylinder 68 11 130 = mixed gas with 50 ppm CO, 15 ppm H_2S, 2.5 vol. % CH_4, 18 vol. % O_2

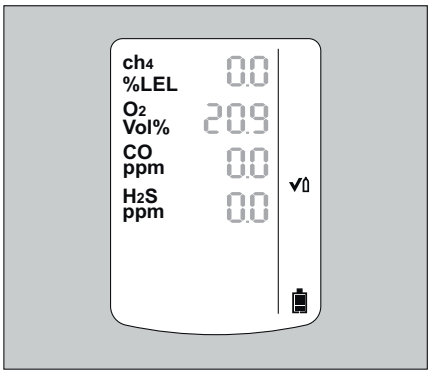
- Connect the test gas cylinder with the calibration cradle (83 18 752).
- Vent the test gas into a fume cupboard or into the open air (with a hose connected to the second connector of the calibration cradle).

⚠ CAUTION
Do not inhale the test gas. Risk to health! Observe the hazard warnings of the relevant Safety Data Sheets.

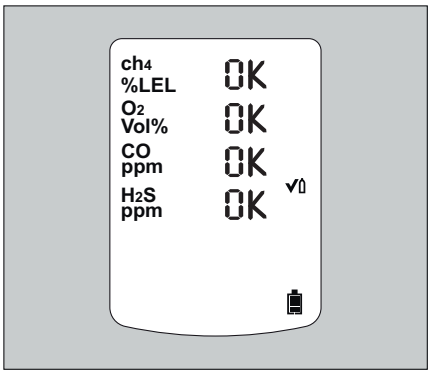
- Switch on the device and insert it into the calibration cradle – press downwards until it engages.
- Call the quick menu and select the function test with gas (bump test), page 16.



– The current gas concentration values and the special symbol » ✓ « (for bump test) flash.
• Press the ⓞ key to start the function test with gas.
• Open the test gas cylinder valve to let test gas flow over the sensor.
– If gas concentration exceeds the alarm thresholds A 1 or A 2 the corresponding alarm will occur. Exit the function test with gas:



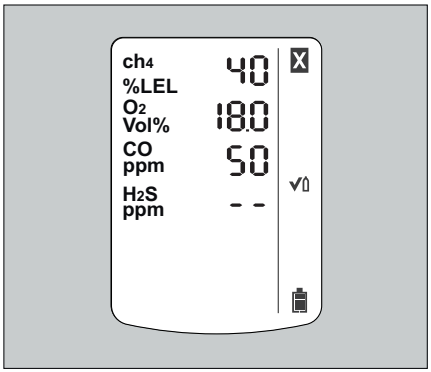
After the preset bump test concentration is reached or a gas alarm is triggered (with the "Quick bump test"):
– The display containing the current gas concentration changes with the display **» OK «**.
– The bump test that was carried out is documented with the result and date in the device memory.



• Close the test gas cylinder valve and remove the device from the calibration cradle.
– If the concentration values have now fallen under the A1 alarm setpoints, the device returns to the measuring mode.

– If the set bump test concentration is not reached within the specified time, the alarm mode is activated to indicate failure.
– The fault message » X « appears and » - - « is displayed instead of the measured value on the faulty measuring channel.
• In this case, repeat the function test with gas or calibrate the device, page 43.

The function test with gas can also be carried out automatically.
The "Bump Test Station" is required for this function, refer to page 41.



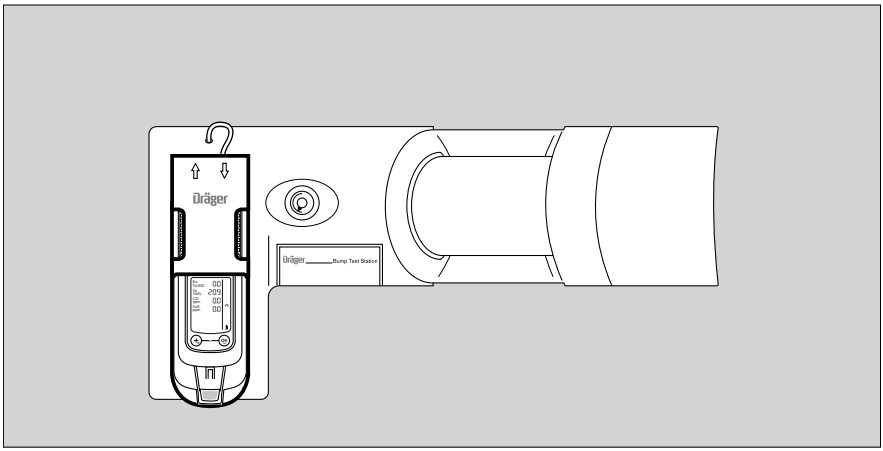
Automatic implementation with the Bump Test Station

Prerequisite:
The device must first be configured for the automatic function test with gas (bump test) using the PC software Dräger CC Vision.

– Activating the device for the automatic function test.
– Adjust the test gas concentration (mixed gas) with the Dräger CC-Vision PC software if it deviates from the following default values – standard on delivery: 50 ppm CO, 15 ppm H_2S, 2.5 vol. % CH_4, 18 vol. % O_2
– Define which measuring channels should participate in the automatic function test. All measuring channels participate in the function test by default.

- Prepare the Bump Test Station according to the instructions.

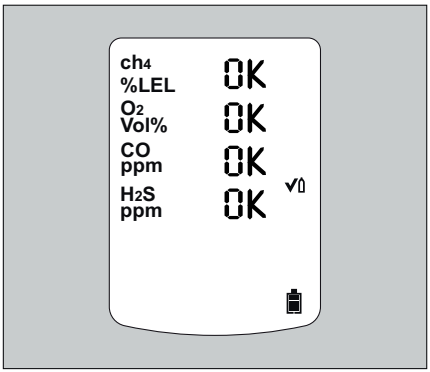
- Switch on the device and insert it into the receptacle of the Bump Test Station until it engages.



03823999_01.eps

– The function test with gas is started automatically. The special symbol » ✓⇧ « (for bump test) flashes.

– If a gas alarm (Quick bump test) is triggered and the preset bump test concentration (Extended bump test) is reached within the specified time, the display shows the current gas concentration, alternating with **» OK «**.



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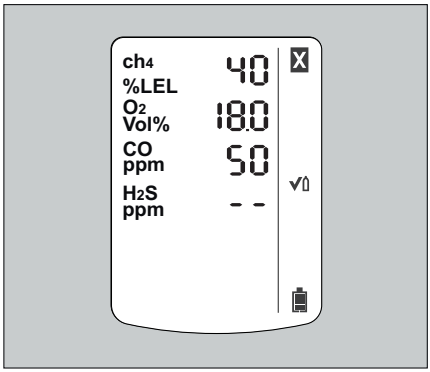
- Remove the device from the Bump Test Station.

– If the concentration values have now fallen under the A1 alarm setpoints, the device returns to the measuring mode.

– An error will be triggered if the preset bump test concentration is not reached within the specified time.
– The fault message » X « appears and » – – « is displayed instead of the measured value on the faulty measuring channel.
- In this case, repeat the function test with gas or calibrate the device, page 43.



The function test with gas can also be carried out manually, refer to page 38.

The PC program Dräger CC Vision can be used to enable the "Automatic calibration after incorrect bump test" option.

NOTICE
After the bump test, the display shows a printer icon even if there is no printer connected to the bump gas station.

Calibrating the Device

NOTICE
Dräger recommends using the extended bump test for cross calibrations (Dräger X-dock technical manual).

Calibration may not be possible due to device and channel errors.
Allow the sensors to warm up before the calibration!
Warm-up time: see Instructions for Use/data sheets of the installed DrägerSensors (at www.draeger.com).

Calibration interval:
- Observe the relevant specifications in the Instructions for Use/data sheets of the DrägerSensors installed.
- For critical applications, observe the recommendations in EN 60079-29-2[1)] or EN 45544-4[2)] and national regulations. We recommend that you calibrate the channels after 6 months.

⚠ CAUTION
Do not inhale the test gas. Risk to health! Observe the hazard warnings of the relevant Safety Data Sheets.

- Improve the zero point accuracy – carry out the fresh air calibration, page 44.
- Set the sensitivity of all sensors to the value of the test gas – carry out the 1-button calibration, page 45.
- Set the sensitivity of a sensor to the value of the test gas – calibrate the sensitivity, page 48.

1) EN 60079-29-2 – Gas measuring device - Selection, installation, use and maintenance of apparatus for the measurement of combustible gases or oxygen
2) EN 45544-4 – Electrical devices for the direct detection and direct concentration measurement of toxic gases and vapors – Part 4: Guidelines for selection, installation, use and maintenance.

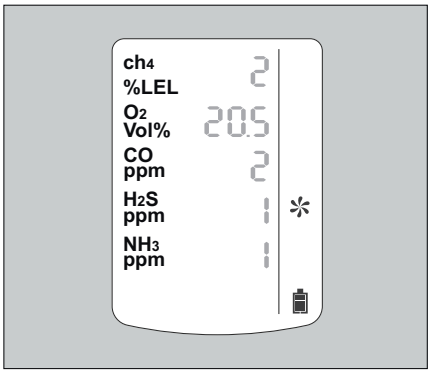
Carrying out the fresh air calibration

To improve the zero point accuracy, you can carry out a fresh air calibration.

NOTICE
If none of the sensors fitted permits calibration with fresh air (e.g. only O_3, only IR-CO_2), fresh air calibration is not offered as a menu function.

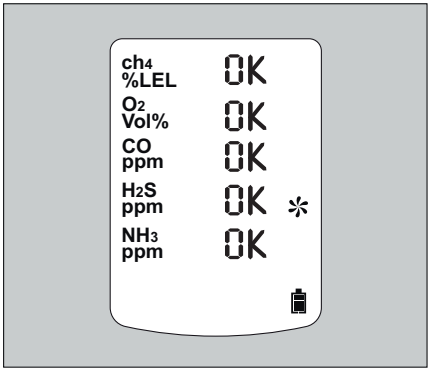
– Calibrate the device to fresh air, free of measured gases or other interfering gases.
– Not all sensors are included in the fresh air calibration[1]. Sensors which have not warmed up or which are faulty prevent a calibration.
  In the case of sensors which are in the warm-up phase, the message **» 159 «** is displayed with the special symbol » ⚠ « (for warning message).
  In the case of a sensor or device error, the message » 109 « is displayed with the special symbol » ⚠ « (for a fault message).
  The message is cleared after 5 seconds and the function is available again in the menu
– During the fresh air calibration, the zero point of all sensors (with the exception of DrägerSensor XXS O_2) is set to 0.
  In the case of DrägerSensor XXS O_2, the display is set to 20.9 vol. %.
• Switch on the device.

Depending on device configuration:
• Call the quick menu and select the Fresh Air Calibration function, page 16.
  or
• Call the calibration menu and select the Fresh Air Calibration function, page 18.
– The current gas concentration values flash.
  When the measured values have stabilized:
• Press the OK key to perform the fresh air calibration.

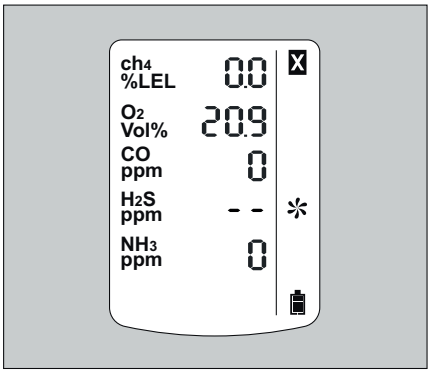


1) Fresh air calibration / zero point calibration is not supported by the DrägerSensor XXS O_3. A zero point calibration / adjustment of these sensors can be conducted using the Dräger CC-Vision PC software. To do so, a suitable zero gas that is free of ozone (e.g. N_2) should be used.

– The display containing the current gas concentration changes with the display **» OK «**.
- Press the ⓞⓚ key to confirm the calibration or wait for approx. 5 seconds.



If a fault occurred during the fresh air calibration.
– The fault message » X « appears and » - - « is displayed for the respective sensor instead of the measured value.
- In this case, repeat the fresh air calibration.
- If necessary, replace the sensor, page 56.



NOTICE
Automatic surrogate calibration If the corresponding gas combination and the sensor are approved to do so, an automatic surrogate calibration and tests can be performed using the PC software Dräger CC-Vision[1)]. A gas for the bump test, for the adjustment and the measured gas can be set in the gas change wizard in Dräger CC-Vision. Conversions are performed automatically and no longer need to be made manually. The settings are also used by the Dräger X-dock.

1) The PC software Dräger CC Vision can be downloaded from the following web address free of charge: www.draeger.com/software

Automatic fresh air calibration of the CatEx sensor in the charging cradle
This feature is used to perform an automatic fresh air calibration of the CatEx sensor after placing it in the charging cradle. The feature can be adjusted using the Dräger CC-Vision PC software.

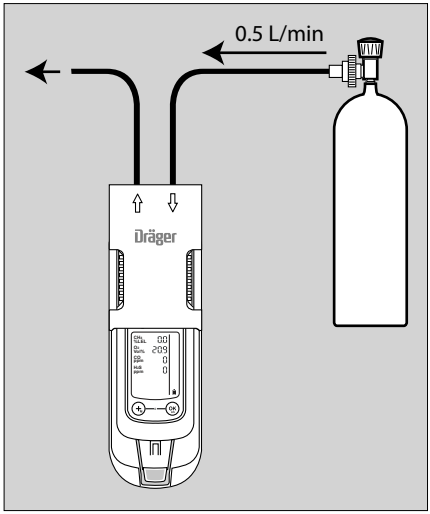
NOTICE
If the automatic fresh air calibration feature of the CatEx sensor is activated, the user must ensure that the charging cradle remains in normal atmosphere (21 vol.% O_2) free of contaminants for the entire duration of the process.

Carrying out 1-button calibration

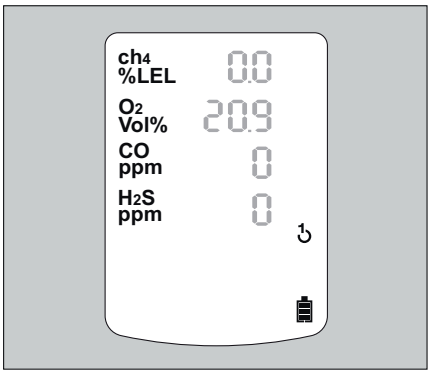
NOTICE
If no sensors are enabled for 1-button calibration by the Dräger CC Vision PC program, the 1-button calibration menu function will not be offered.

– All sensors that are enabled by the Dräger CC Vision PC program take part in the 1-button calibration.
– In the case of the 1-button calibration, the sensitivity of all sensors is set to the value of the test gas.
When using the test gas cylinder 68 11 130 = mixed gas with 50 ppm CO, 15 ppm H_2S, 2.5 vol. % CH_4, 18 vol. % O_2.
– If a mixed gas with another composition is used, the specified concentration values in the device must be changed to the target values of the mixed gas used using the PC software Dräger CC Vision.
• Connect the test gas cylinder with the calibration cradle.
• Vent the test gas into a fume cupboard or into the open air (with a hose connected to the second connector of the calibration cradle).

⚠ CAUTION
Health hazard! Do not inhale the test gas. Risk to health! Observe the hazard warnings of the relevant Safety Data Sheets.



- Switch on the device and insert it into the calibration cradle until it engages.
- Call the calibration menu, enter the password and select the 1-button calibration function, page 18.
- Press the (OK) key to start the 1-button calibration.



- Open the test gas cylinder valve to let test gas flow over the sensor.

– The currently displayed measured values start to flash.
The flashing stops after a static measured value has been reached.

– The calibration is now carried out automatically.

– The displayed measured values change to the values according to the gas supplied.

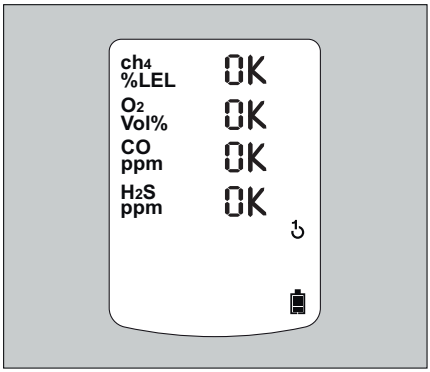
– The automatic stability monitoring can be overridden by pressing the OK key.
A calibration then takes place immediately. If it is detected that no test gas has been applied, the 1-button calibration will be aborted. The channels will then indicate **» n/a «**. If only one sensor is taking part in the 1-button calibration, a calibration will be performed in each case when the OK key is pressed.

When the calibration is completed and the displayed measured values have stabilized:

– The display containing the current gas concentration changes with the display **» OK «**.

- Press the (OK) key or wait for 5 seconds to quit the calibration.

– The device changes to the measuring mode

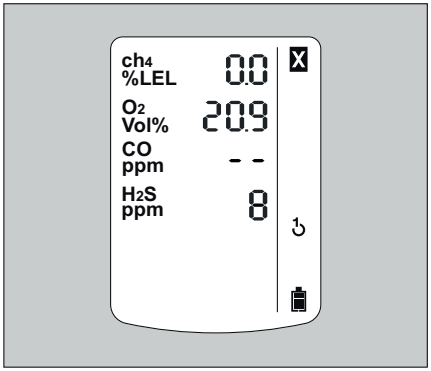


- Close the test gas cylinder valve and remove the device from the calibration cradle.

If a fault occurred during the 1-button calibration.

– The fault message » X « appears and » - - « is displayed for the respective sensor instead of the measured value.

- In this case, repeat the 1-button calibration or carry out a single gas calibration, refer to page 48.
- If necessary, replace the sensor, page 56.



Calibrating the sensitivity for an individual measuring channel

– The span calibration can be carried out specifically for individual sensors.
– In the case of the span calibration, the sensitivity of the selected sensor is set to the value of the test gas used.
– Use a standard test gas.
Allowed test gas concentration:

Ex: 40 to 100 %LEL

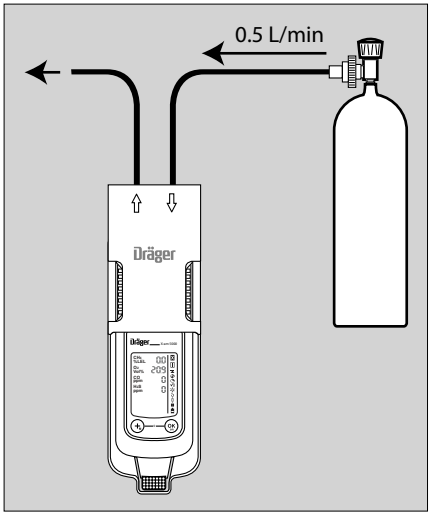
O_2: 10 to 25 vol. %

CO: 20 to 999 ppm

H_2S: 5 to 99 ppm

NO_2: 5 to 99 ppm

Test gas concentration of other gases: refer to the Instructions for Use of the respective DrägerSensors.

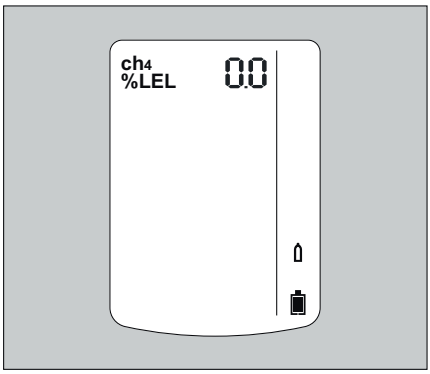


- Connect the test gas cylinder with the calibration cradle.
- Vent the test gas into a fume cupboard or into the open air (with a hose connected to the second connector of the calibration cradle).

⚠ CAUTION
Health hazard! Do not inhale the test gas. Risk to health! Observe the hazard warnings of the relevant Safety Data Sheets.

- Switch on the device and insert it into the calibration cradle.
- Press and hold the **[+]** key for 5 seconds to call the calibration menu, enter the password and select the single gas calibration function, page 18.
- Press the ⓞⓚ key to start the channel selection.

– The display flashes the gas of the first measuring channel, e.g., » Ex - %LEL «.



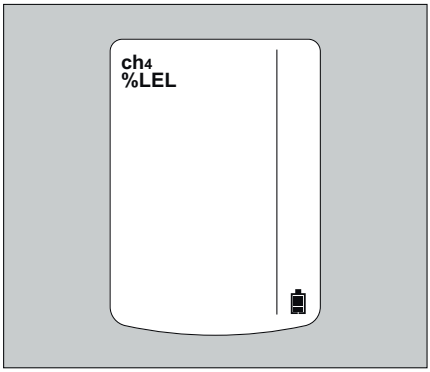
- Press the ⓞⓚ key to carry out the calibration of this measuring channel, or
- Use the ⊕ key to select another measuring channel (O_2 - vol. %, H_2S - ppm or CO - ppm).

Span calibration for CatEx

– If the measuring range end value < = 100%LEL, the adjustment for the heat tinting is offered.

Display in the case of channel selection:

- Open the test gas cylinder valve to let test gas flow over the sensor.
- Press the ⓞⓚ key to start the calibration for the heat tinting or press the ⊕-key to select the next sensor.



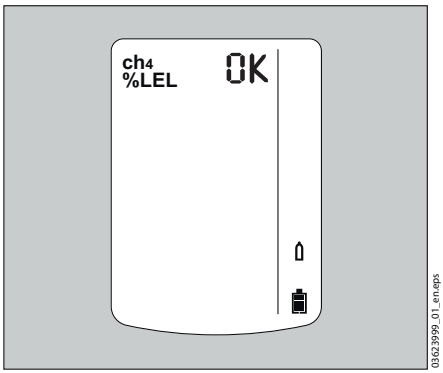
If the displayed measurement value is stable:

- Press the ⓞⓚ key to perform the calibration.

– The display containing the current gas concentration changes with the display **» OK «**.

- Press the ⓞⓚ key or wait for approx. 5 seconds to end the calibration of this measuring channel.

– The next measuring channel is offered for calibration.
– After the calibration of the last measuring channel, the device changes to measuring mode.

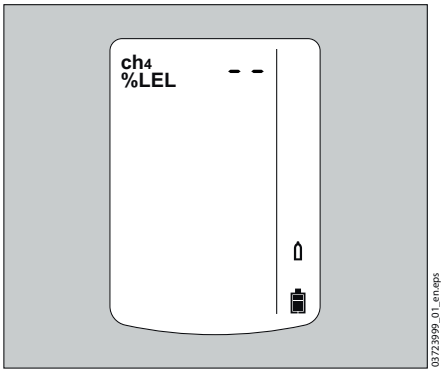


- Close the test gas cylinder valve and remove the device from the calibration cradle.

If a fault occurred during the span calibration.

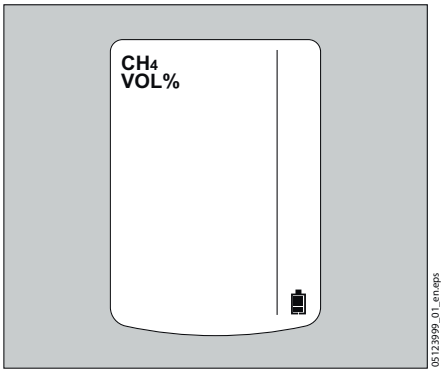
– The fault message » ☒ « appears and » – – « is displayed for the sensor instead of the measured value.

- In this case, repeat the calibration.
- If necessary, replace the sensor, page 56.

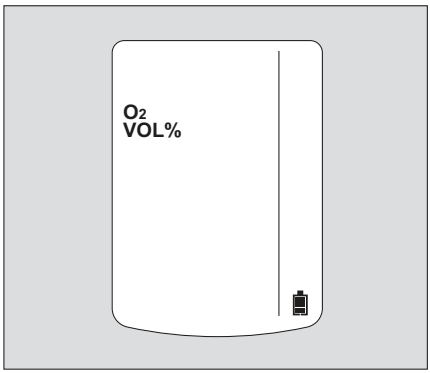


– If the gas CH_4 (measurement range up to 100 vol. %) is selected on the CatEx channel, the heat conductivity is calibrated, display with channelselection:

- Press the ⓞⓚ key to perform the calibration for heat conductivity.



- Press the ⊕ key to select the next sensor.



- Press the OK key to perform the calibration of the selected measuring channel.

– The test gas concentration is displayed.

- Press the OK key to confirm the test gas concentration or use the **[** + **]** key to change the test gas concentration and complete the process by pressing the OK key.

– The measurement value flashes.

- Open the test gas cylinder valve to let test gas flow over the sensor.

– The displayed, flashing measurement value changes to the value according to the supplied test gas.
– Press the ⊕ key to select the next sensor.

Note on the use in underground mining:
– When calibrating the Ex channel to methane as the measured gas, the indication on the instrument must be set to a value 5 % (relative) higher than the test gas concentration used.

Automatic fresh air calibration in the charging cradle (CatEx sensor only):
Calibrate the gas detector to fresh air, free of measured gases or other interfering gases. If the function is selected, a fresh air calibration of the CatEx sensor is performed automatically as soon as the gas detector is inserted in the charging cradle. This function can be selected or disabled using the CC-Vision PC software.

No calibration takes place if the warm-up is not yet complete:
- Alarm LED is illuminated red.
- The acoustic signal sounds twice followed by three short tones and the gas detector switches off.

Once the fresh air calibration has been successfully completed:
- Alarm LED is illuminated red.
- The acoustic signal sounds once followed by three short tones and the gas detector switches off.

If a fault has occurred during the fresh air calibration:
- The fault message ☒ appears and – – is displayed for the respective sensor instead of the measured value.
- In this case, repeat the fresh air calibration.
  If necessary, have the sensor replaced by qualified personnel.

Replacing the batteries / rechargeable batteries

⚠ WARNING

Explosion hazard! To reduce the risk of flammable or explosive atmospheres igniting, it is essential that the warning notices below are observed:
Do not throw used batteries into fire or try to open them by force.
Do not replace or charge batteries in areas at risk of an explosion hazard.
Do not mix new batteries with used batteries, and do not mix batteries from different manufacturers or of different types.
Remove batteries before maintenance work.
Batteries / rechargeable batteries are part of the Ex approval.
Only the following types may be used:
— Alkaline batteries – T3 – (non rechargeable!)
Panasonic LR6 Powerline,
Varta Type 4106[1)] (power one) or
Varta Type 4006[1)] (industrial)
— Alkaline batteries – T4 – (non rechargeable!)
Duracell Procell MN1500[1)], Duracell Plus Power MN1500[1)]
— NiMH rechargeable batteries – T3 – (rechargeable)
GP 180AAHC[1)] (1800) max. 40 °C ambient temperature.

1) Not subject to the Metrological Performance Test BVS10 ATEX E 080X and PFG 10 G 001X.

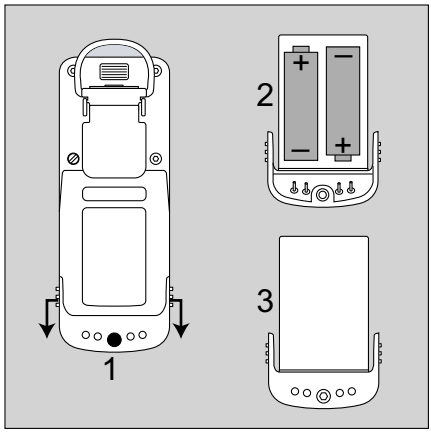
Switching off the device:
- Press and hold the OK key and the ⊕ key at the same time.

1 Loosen the screw (2.0 mm hexagon socket) on the power pack and remove the power pack.

2 Replace the alkaline batteries with new ones or the rechargeable NiMH batteries with charged ones – **ensure correct polarity**.

3 Completely replace the power pack T4 (with sealed rechargeable batteries, order no. 83 18 704).

- Insert the power pack into the device and tighten the screw, the device switches on automatically.



After replacing the power pack T4, it is recommended that a complete charging is carried out.

After the batteries have been replaced:
– The settings and data are stored when the battery is replaced. The sensors warm up again.

Charging the rechargeable batteries

⚠ WARNING

Explosion hazard! To reduce the risk of flammable or explosive atmospheres igniting, it is essential that the warning notices below are observed:
Do not charge underground or in explosion-hazard areas! Danger of explosion!
The chargers are not designed in accordance with the regulations for firedamp and explosion protection.
Charge NiMH power pack T4 (type HBT 0000) with the appropriate Dräger charger.
Ambient temperature during the charging process: 0 to +40 °C.

Even if the device is not used, we recommend that you store the device in the charger (Charging module X-am 1/2/5000, order no. 83 18 639)!

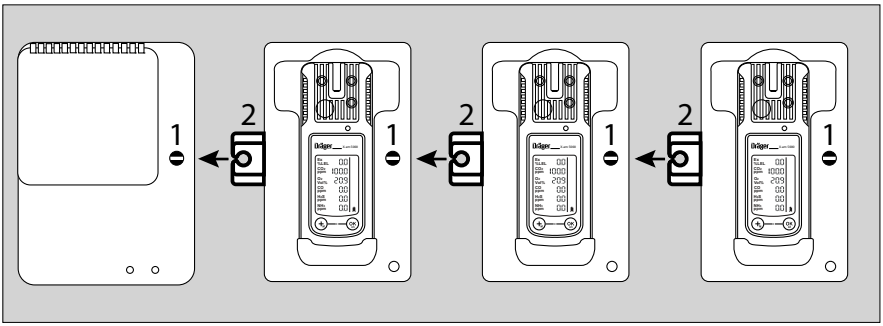
To maintain the lifetime of the batteries, charging is temperature controlled and only performed in a temperature range of 5 to 35 °C.
When this temperature range is left, the charging process is automatically interrupted and automatically continued after the temperature range has been reached again.
The charging time is typically 4 hours.
A new NiMH power pack reaches its full capacity after three complete charging/discharging cycles. Never store the device for extended periods without being connected to a power source (maximum of 2 months) because the internal buffer battery will drain.

Charging with the multiple charging station

– A maximum of 20 devices can be charged at the same time on the power pack (order no. 83 18 805) of the multiple charging station.
• When attaching the charging modules, disconnect the power pack from the mains supply!

Attaching charging modules

1 Turn the slots of the interlock into a horizontal position by using a screwdriver or coin.
2 Insert the projecting tongue of the charging module (at the same time, current entry) until it engages.
1 Close the interlock with a quarter turn (slot is positioned vertically).



- Attach additional charging modules in the same way.

– Always connect or disconnect the charging modules individually and not in groups in order to prevent the charging station from becoming damaged. During transportation, the power pack and the charging modules should also always be handled individually and without inserted devices.

- Position the device on an even and level surface.

- Connecting the power pack to the mains.

1 The green "Mains" LED lights.

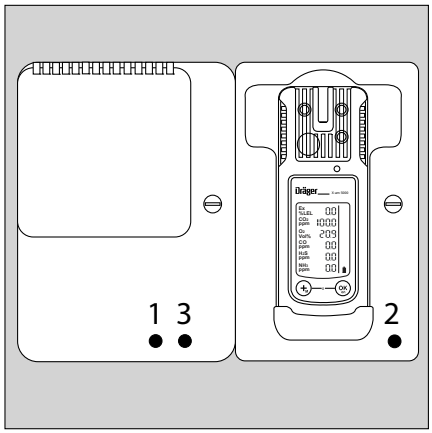
- Insert the device into the charging module.

2 Display LED on the charger:

Charge

Fault

Full



If a fault occurs:
Remove the device from the charging module and insert it again.
If the fault still occurs, have the charging module repaired.

It takes approx. 4 hours to fully charge an empty rechargeable battery.

A short circuit of the charging contacts in the charging modules, e.g., by metallic objects that have fallen in, does not result in damage to the charging station. It should, however, be avoided due to possible heating hazards and incorrect displays on the charging module.

In the event of a short circuit or if the power pack is overloaded:

3 The red "Overload" LED lights, and an audible alarm sounds.

– After the fault has been corrected, the alarm is switched off automatically and the charging process is restarted.

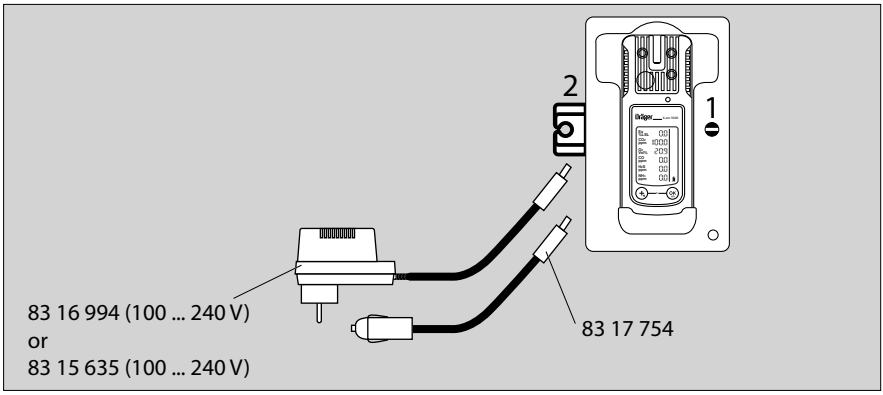
– In the event of a power failure, the devices already charged will be protected from discharging.

Charging with charging module and plug-in power pack or vehicle charging adapter

– When using the power pack (order no. 83 16 994), up to 5 devices can be charged at the same time, with power pack (order no. 83 15 635) up to 2 devices.

– The power pack contained in the rechargeable battery and charging set (order no. 83 18 785) is suitable for charging a device.

– When using the vehicle charging adapter (order no. 45 30 057) it is recommended that you supply every charging module separately.



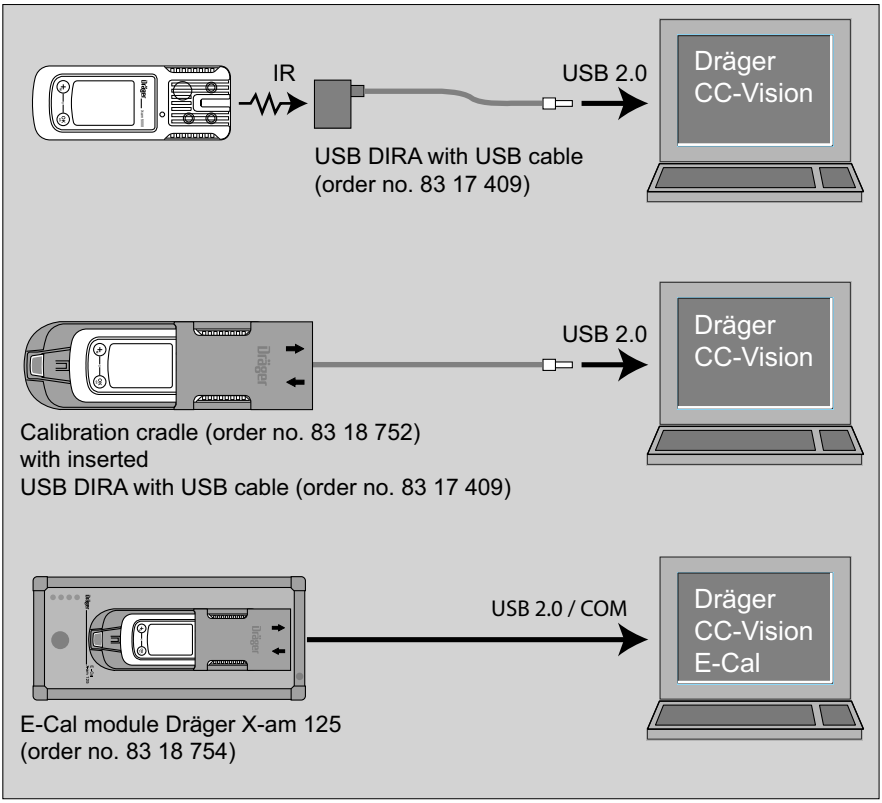
The charging process is carried out analog to charging with the multiple charging station.

Replacing the Sensors

⚠ CAUTION
Damage to components! There are components in the instrument that are sensitive to electric charge. Before opening the instrument to replace the sensor, ensure that the person performing the work is earthed to avoid damage to the device. Earthing can be safely ensured, e. g. via an ESD workstation (electrostatic discharge).

NOTICE
To open the instrument, unfasten the casing screws using a screwdriver (Torx T6).

- To replace the sensors of the device, connect the device with a PC.
- Replace the sensors using the PC program Dräger CC Vision.



Next:
- Carry out a fresh air calibration, page 44.

and then:
- Calibrate the sensitivity:
  either
  carry out 1-button calibration, page 45
  or
  carry out span calibration, page 48.

Electrochemical sensors

⚠ WARNING
Do not throw into fire, Do not force open. Danger! Acid burn risk! Sensors of type XXS O_3 and XXS NO_2 LC contain small quantities of nanomaterials.

Like batteries, only dispose of as special waste,
in accordance with local waste disposal regulations. Further information can be obtained from the relevant local authority and from appropriate waste disposal companies.

The DrägerSensor CatEx 125 PR should be disposed of as electronic waste.

Sensor warm-up acceleration

There is a function available for accelerating the warm-up procedure for selected EC sensors. The function shortens the time taken until the unit is ready to make measurements, i.e. the time taken to save the display and alarm evaluation of the measurements. The time to activate the calibration is not changed.
- In order to use the sensor warm-up acceleration function in the Dräger X-am 5000, at least one sensor suitable for the purpose must be fitted and registered in the unit using the Dräger CC-Vision PC software.
- After that, activate the function by ticking the "Accelerated warm-up" checkbox ("Device" menu) and updating the device data with Dräger CC-Vision.

NOTICE
A selection menu for activating the process will only be displayed after the device is restarted by plugging in a power pack.

- Restart the device by plugging in a power pack.

– All the display segments, including the visual, audible and vibration alarms, are activated for a short time.
– The software version is displayed.
– The instrument performs a self test.
– The sensor warm-up acceleration menu is displayed.
  The steps in the selection menu are limited by a 25-second time-out, which then changes to the standard setting of unaccelerated warm-up and proceeds with the device start-up procedure.

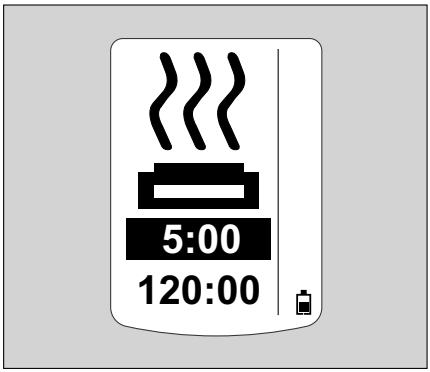
- It is necessary to select between two times for the sensor warm-up acceleration,

— the shortened time achievable as a result of the warm-up acceleration,
— the unshortened time required by the installed sensors to save the measurement display (measurement does not flash any more).

- Select the shortened warm-up time with the ⊕ button and confirm it with the OK button.

– The function for entering the password is called up.

- Enter the digits with the ⊕ button and confirm with the OK button.



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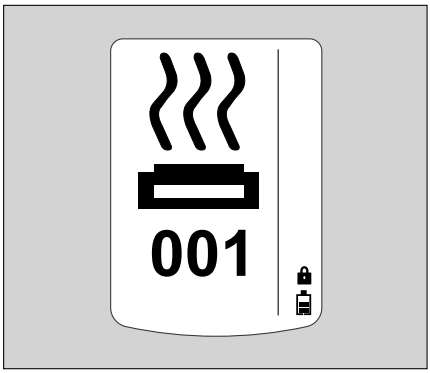

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– Start of the warm-up acceleration.
– The remaining time is displayed and decremented.

⚠ WARNING

This function requires that the device is in a gas-free environment. A warning screen is displayed and the remaining time during which no gas may be applied is shown It is essential to ensure that the sensor is in the fresh air during this time (for approx. 5 minutes)! Any gas applied during this period could later result in faulty alarms or suppressed alarms!

If the procedure is unsuccessful, e.g. as a result of a defective sensor, this will be indicated by error code **»** X07 **«** on the channel for the affected sensor (X). In the event of a fault, the device will also switch to the unaccelerated mode.

Dräger recommends that the device not be switched off and on again for a period of two hours when the accelerated warm-up is in use.

Cleaning

The device does not need any special care.

- Dirt and deposits can be removed from the device by washing it with cold water. A sponge can be used for wiping if necessary.

⚠ CAUTION

Abrasive cleaning implements (brushes etc.), cleaning agents and cleaning solvents can destroy the dust and water filters.

- Carefully dab dry the device using a cloth.

For information on suitable cleaning and disinfecting agents and their specification, see document 9100081 at www.draeger.com/ifu.

Storage

- Dräger recommends storing the instrument in the charger module (order no. 83 18 639).
- Dräger recommends checking the charge of the power supply at least every three weeks if the instrument is not stored in the charger module.

Disposal

This product must not be disposed of as municipal waste. This is indicated by the adjacent icon.
You can return this product to Dräger free of charge. For information please contact the national sales organisations and Dräger.

Batteries and rechargeable batteries must not be disposed of as municipal waste. This is indicated by the adjacent icon. Collect and dispose of batteries and rechargeable batteries at battery collection centres, in accordance with applicable regulations.

Technical Data

X-am 5000

Ambient conditions:	
during operation and storage	Temperature class T4 (-20 to +50 °C): NiMH power packs type: HBT 0000 Power pack type: ABT 0100 with alkaline single cell type: Duracell Procell MN 1500[1)], Duracell Plus Power MN 1500[1)] Temperature class T3 (-20 to +40 °C): Power pack type: ABT 0100 with NiMH single cell type: GP 180AAHC[1)] with alkaline single cell type: Panasonic LR6 Powerline Temperature class T3 (0 to +40 °C): Power pack type: ABT 0100 with alkaline single cell type: Varta 4006[1)], Varta 4106[1)]
Temperature range over a short period (ATEX & IECEx only)[1)]:	-40 to +50 °C Maximum 15 minutes with NiMH power pack T4 (HBT 0000) Prerequisite: storage of the instrument at room temperature (+20 °C) for at least 60 minutes in advance.
Air pressure	700 to 1300 hPa
Humidity	10 to 90 % (to 95 % briefly) relative humidity
Device data	
Protection class	IP 67 for devices with sensors
Alarm volume	Typically 90 dB (A) in 30 cm distance
Operation time	
– Alkaline battery	Typically 12 hours under normal conditions
– NiMH power pack: T4 (HBT 0000)	Typically 12 hours under normal conditions
Dimensions	approx. 130 mm x 48 mm x 44 mm (H x W x D)
Weight	approx. 220 g to 250 g
Storage time	
X-am 5000	1 year
Sensors	1 year
Position of use	any
Refresh interval for display and signals	1 s

1) Not part of the BVS 10 ATEX E 080 X and PFG 10 G 001 X technical suitability tests.

Order List

Name and description	Order no.
Dräger X-am 5000 Unlimited multi gas detector for 1 to 5 gases with replaceable sensors. With selectable special calibration. Default calibration for the ex-sensor: methane. With default alarm thresholds that can be adjusted specifically for each country.	**83 20 000**
Power supply units:	
NiMH power pack T4	**37 03 887**
Battery holder ABT 0100[1)] (without alkaline batteries)	**83 22 237**
Alkaline batteries T3 (2x)[1)]	**83 22 239**
Alkaline batteries T4 (2x)[1)]	**83 22 240**
Battery and charger set (includes NiMH power pack T4, charger module for Dräger X-am 1/2/5000 and plug-in power supply unit)	**37 03 889**
Chargers:	
Charging adapter for Dräger X-am 1/2/5000	**83 26 101**
Charger module for Dräger X-am 1/2/5000	**83 18 639**
Plug-in power supply unit 100–240 VAC; 6.25 A for charging up to 20 devices adapter required for 83 21 850	**8321850** **8325736**
Plug-in power supply unit (worldwide) for max. 5 Dräger X-am 1/2/5000 charger modules	**83 16 994**
Vehicle connection, 12 V/24 V for Dräger X-am 1/2/5000 charger module	**45 30 057**
Vehicle mount for 1 Dräger X-am 1/2/5000 charger module	**83 18 779**

Name and description	Order no.
Accessories The accessories are not part of BVS10 ATEX E 080X and PFG 10 G 001X.	
Pump accessories:	
Dräger X-am Pump	**83 27 100**
Case for Dräger X-am Pump	**83 27 104**
USB power supply unit (for Dräger X-am Pump)	**83 27 102**
USB cable (for Dräger X-am Pump)	**83 27 108**
Rubber ball pump	**68 01 933**
Manual pump adapter	**83 19 195**
Filter set for X-am 1/2/5000	**83 19 364**
Extension hoses and probes (excerpt):	
Measuring probe[2], 0.5 m	**64 08 238**
Measuring probe[2], 1.5 m	**64 08 239**
Telescopic probe[2], plug-in	**68 01 954**
Telescopic probe[2] 100 with accessories	**83 16 530**
Telescopic probe[2] 150 stainless steel	**83 16 533**
Bar probe[2] 90	**83 16 532**
Floating probe with accessories (transparent)	**83 18 371**
Fluoroelastomer hose (5 mm), sold by the metre, specify length when ordering	**12 03 150**
Hose CR-NR (rubber, 5 mm), sold by the metre, specify length when ordering	**11 80 681**
3 mm tube connection set[3]	**83 27 641**
5 mm tube connection set	**83 27 642**
Floating probe (3 mm), EPP, 3 m hose[3]	**83 25 831**
Floating probe (3 mm), EPP, 10 m hose[3]	**83 25 832**
Fluoroelastomer hose (3 mm) incl. adapter, 5 m[3]	**83 25 705**
Fluoroelastomer hose (3 mm) incl. adapter, 10 m[3]	**83 25 706**
Fluoroelastomer hose (3 mm) incl. adapter, 20 m[3]	**83 25 707**

Name and description	Order no.
Fluoroelastomer hose[4] (3 mm), sold by the metre, specify length when ordering	**83 25 837**
Hose (3 mm)[4], PVC, sold by the metre, specify length when ordering	**83 25 838**
Hose (rubber, 3 mm)[4], CR-NR, sold by the metre, specify length when ordering	**83 25 839**
Accessories for recording the measured values and for configuration:	
Dräger GasVision (trial version available at www.draeger.com/software)	
Dräger GasVision licence key (full version)	**83 25 646**
Dräger CC-Vision (full version available at www.draeger.com\software)	
USB DIRA with USB cable (USB infrared adapter for communication between Dräger X-am 1/2/5000 and PC)	**83 17 409**
Calibration accessories:	
Dräger X-dock, e.g. X-dock 5300 X-am 125	**83 21 880**
Bump test station, incl. mixed-gas cylinder	**83 19 130**
Calibration cradle for Dräger X-am 1/2/5000	**83 18 752**
Mixed-gas cylinder 2.5 vol.% CH_4, 18 vol.% O_2, 15 ppm H_2S, 50 ppm CO	**68 11 130**
Test gas cylinder, propane, 0.9 vol.% C_3H_8 in air	**68 11 118**
On-demand controller	**83 16 556**
Standard controller	**68 10 397**
Other accessories:	
Protective sleeve for Dräger X-am 1/2/5X00	**83 21 506**
Carrying bag	**83 18 755**

Name and description	Order no.
Spare parts	
DrägerSensor CatEx 125 PR, 0 to 100 %LEL (or 0 to 100 vol.% methane)	**68 12 950**
DrägerSensor Cat Ex 125 PR Gas, 0 to 100 %LEL	**68 13 080**
DrägerSensor XXS O_2, 0 to 25 vol.%[5)]	**68 10 881**
DrägerSensor XXS O_2 100, 0 to 100 vol.%	**68 12 385**
DrägerSensor XXS H_2S LC, 0 to 200 ppm	**68 11 525**
DrägerSensor XXS CO LC, 0 to 2000 ppm[1)]	**68 13 210**
Other DrägerSensors	**upon request [6)]**

1) Not part of the BVS10 ATEX E 080X and PFG 10 G 001X technical suitability test.
2) The filter set for X-am 1/2/5000 (order no. 83 19 364) includes a 5 mm tube connection set to connect the probe to the pump.
3) This accessory is optimised for the Dräger X-am Pump (market launch in 2017) (for hoses with 3 mm inner diameter).
4) 3 mm tube connection set (order no. 83 27 641) required.
5) Expected sensor life time: O_2, CO and H_2S >5 years, CatEx > 3 years.
6) Data sheets for all sensors that may be used with the device can be downloaded from the product page of the X-am 5000 on the following website: www.draeger.com.

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