Dräger X-zone 5000

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Contents

For Your Safety

Strictly follow the Instructions for Use
Any use of the device requires full understanding and strict observation of these Instructions for Use. The device is only to be used for the purposes specified here.

Maintenance
The device must be inspected and serviced regularly by trained service personnel. Repair of the device may only be carried out by trained service personnel.
We recommend that a service contract be obtained with Dräger and that all repairs also be carried out by Dräger. Only genuine Dräger parts should be used for maintenance.
Strictly follow the instructions in the chapter "Maintenance intervals" on Page 18.

Accessories
Do not use accessory parts other than those specified in the order list Page 24.

Safe coupling with electrical devices
Electrical connections to devices which are not listed in these Instructions for Use should only be made following consultation with the respective manufacturers or an expert.

Use in areas subject to explosion hazards
Devices or components for use in explosion-hazard areas which have been tested and approved according to national, European or international Explosion Protection Regulations may only be used under the conditions specified in the approval and with consideration of the relevant legal regulations.
The equipment or components may not be modified in any manner. The use of faulty or incomplete parts is forbidden. The appropriate regulations must be observed at all times when carrying out repairs on these devices or components.

Safety symbols used in these Instructions for Use
These Instructions for Use contain a number of warnings for risks and hazards which might occur when using the instrument. These warnings contain signal words which will alert you to the degree of hazard you may encounter. These signal words and corresponding hazards are as follows:

⚠ DANGER
Indicates an immediate hazardous situation which, if not avoided, could result in death or serious injury.

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

⚠ CAUTION
Indicates a potential hazardous situation which, if not avoided, could result in injury or damage to property. It may also be used to alert against unsafe practices.

NOTICE
Additional information on how to use the device.

Intended Use

The Dräger X-zone 5000 is an explosion-proof, portable alarm amplifier for the quasi-stationary monitoring of hazard areas. The Dräger X-zone 5000 can be used in combination with the Dräger X-am 5000/5600 gas detection instruments. Several Dräger X-zone 5000 devices can operate in a self-crosslinking network.

NOTICE
The Dräger X-zone 5000 is intended for detection in ambient air. Any increased exposure to certain hydrocarbons can result in restrictions in the detection quality of the electrochemical sensors.

Description

The Dräger X-zone 5000 alarm amplifier is intended for use under industrial conditions within a specified temperature range for an uninterrupted operating period of up to 5 days.
Via a wireless connection and/or communication cable, several Dräger X-zone 5000 devices can be grouped to form an alarm chain. In the event of an alarm, all connected Dräger X-zone 5000 devices will issue the alarm.
The alarm is generated using the gas detection instrument
Dräger X-am 5x00. The Dräger X-am 5x00 is connected via an infrared interface
to the Dräger X-zone 5000. In addition to alarm generation, the Dräger X-am 5x00 is used as the user interface for the Dräger X-zone 5000. When the Dräger X-am 5x00 generates a gas alarm, this is transmitted to the Dräger X-zone 5000 and amplified acoustically and optically.
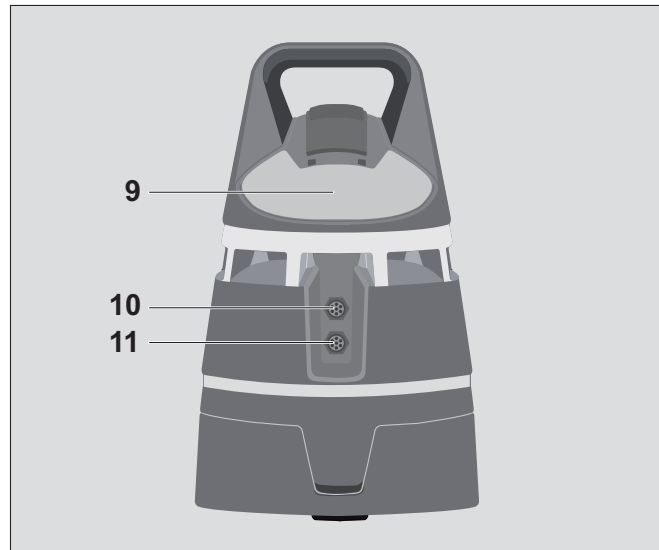
3

What is what

Front

1 Carrying handle
2 LED indicators
3 LED alarm ring
4 Inductive charging station
5 Lock
6 Device receptacle
7 Dräger X-am 5x00 holder diffusion mode
**8** Dräger X-am 5x00 holder pump mode (optional)
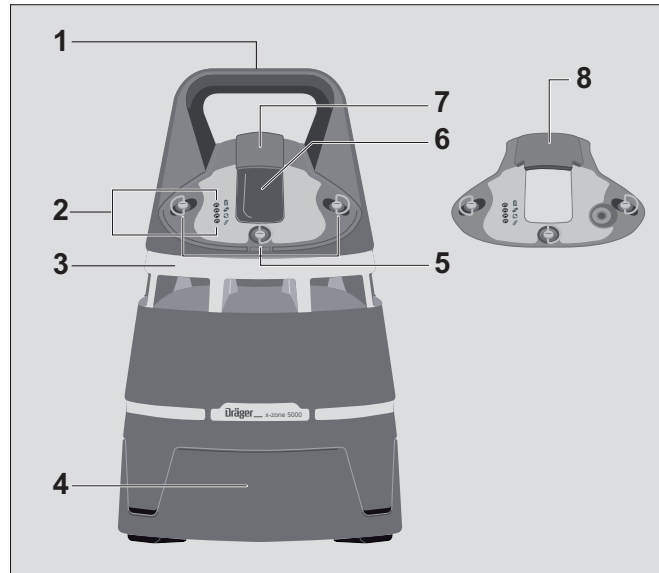
Rear side

9 Quick-reference guide
10 Switch relay connection / RS485 connection
11 Charging port connection / RS485 connection

Display

12 IR interface
13 Battery LED
14 Data transmission LED
15 Pump LED
16 Grouping LED
17 ⊕/wireless network key
18 ⊛ key
19 Power contacts for Dräger X-am 5x00
20 Pump inlet (optional)
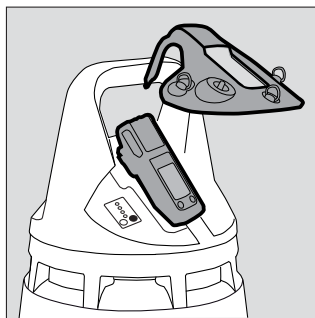**21** Pump outlet (optional)
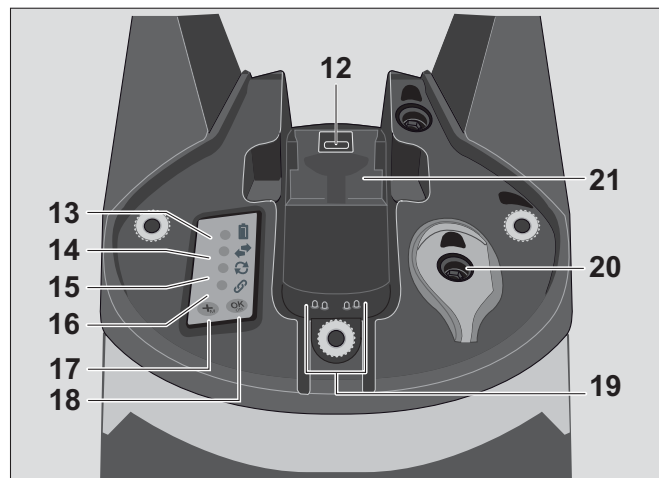
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Operation

Switching on the instrument

STANDBY mode

- Release the lock on the holder.
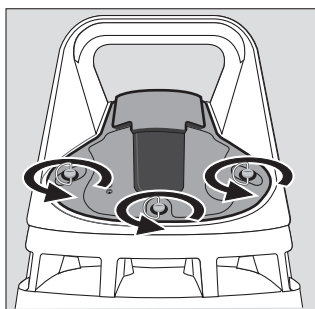
- Remove the holder.
- Hold down the ⊛ key on the Dräger X-zone 5000 for approx. 3 seconds.
- The battery LED will be lit in green, red/green or red (refer to "Status LED Overview" on page 21) depending on the battery capacity.
- The Dräger X-zone 5000 is in the STANDBY mode.

- Place the Dräger X-am 5x00 into the device receptacle.

NOTICE

The Dräger X-am 5x00 must be equipped with a NiMH battery.
The clip on the Dräger X-am 5x00 must be connected.

- Place the holder onto the housing.
- Fasten the lock at the holder.

ON mode

> ⚠ **CAUTION**
>
> When switching on the Dräger X-zone 5000, Dräger recommends wearing hearing protection or using the alarm-attenuation ring (order no. 83 20 110) as the acoustic alarm is activated for a brief period.

- Switch on the Dräger X-am 5x00 in accordance with the instructions for use.
- The visual and the audible alarm will be activated for a short time.
- The Dräger X-am 5x00 switches to the X-zone mode (refer to "X-zone mode:" on page 5).
- The visual and acoustic life signal (green LED ring and single tone) is issued depending on the configuration (1 - 60 seconds; default setting: 2 seconds).
- The Dräger X-zone 5000 is in the ON mode and ready for operation.
- In ON mode, the alarm signals of the Dräger X-am 5x00 are evaluated, processed, and, if applicable, transmitted to other Dräger X-zone 5000 devices.

X-zone mode:

- The battery symbol █ on the Dräger X-am 5x00 is replaced by the X-zone mode symbol ═ on the Dräger X-zone 5000.
- The Dräger X-am 5x00 is supplied via the Dräger X-zone 5000 battery.
- If the activated Dräger X-am 5x00 is removed from the Dräger X-zone 5000, the device will exit X-zone mode again after max. 10 seconds.

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Dräger X-am 5x00 info mode

- Press and hold the ⊛ key of the Dräger X-am 5x00 for approx. 3 seconds in detection mode.
– Press the ⊛ key successively for the next display. The peak values and the exposition values TWA and STEV as well as additional X-zone information will be displayed.
  If there are warnings or faults, the corresponding notes or error codes (e. g. X01) are displayed (refer to "Fault messages" on page 17).

Info window for Dräger X-am 5x00:
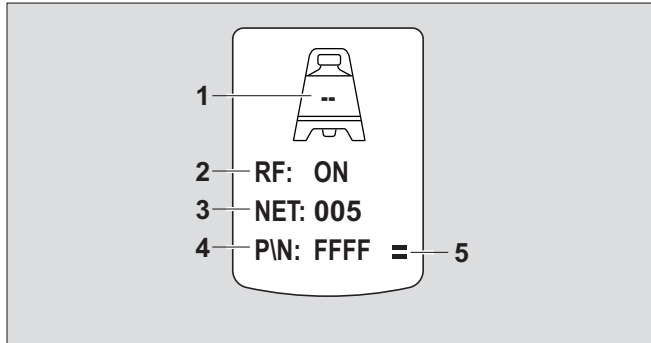
1 **Station number in grouping mode:**
  The station number is not currently supported by the Dräger X-zone 5000.
2 **Wireless status: ON/OFF:**
  Displays whether the wireless function of the Dräger X-zone 5000 is switched on or off.
  The wireless function can be switched on and off using the Dräger CC-Vision PC software (refer to "Device configuration" on page 14).
3 **Network number:**
  If independent radio networks are required, different network numbers must be assigned (refer to "Establishing a wireless connection" on page 8).
  The network number can be set using the Dräger CC-Vision PC software (refer to "Device configuration" on page 14).
4 **Grouping ID:**
  The grouping ID is not currently supported by the Dräger X-zone 5000.
5 **X-zone mode symbol**
  Displays whether or not there is a connection between the Dräger X-zone 5000 and the Dräger X-am 5x00.

– If no key is pressed for 10 seconds, the Dräger X-am 5x00 returns automatically to detection mode.

Switching off the device

> **⚠ CAUTION**
>
> When switching off the Dräger X-zone 5000, Dräger recommends wearing hearing protection or using the alarm-attenuation ring (order no. 83 20 110) as the acoustic alarm is activated for a brief period.

STANDBY mode

- Switch off the Dräger X-am 5x00 in the Dräger X-zone 5000 in accordance with the instructions for use.
– The visual and the audible alarm will be activated for a short time before the Dräger X-zone 5000 switches off.
– The Dräger X-zone 5000 switches to the STANDBY mode.

OFF mode

- Release the lock at the holder.
- Remove the holder.
- If necessary, remove the Dräger X-am 5x00 from the device receptacle.
- Press the ⊛ key and the ⊕ key on the Dräger X-zone 5000 and hold down for approx. 3 seconds.
– The battery LED goes off.
– The Dräger X-zone 5000 is switched off (OFF mode).

Power supply for the Dräger X-am 5x00 with NiMH battery in the Dräger X-zone 5000:

Device mode	Power supply for the Dräger X-am 5x00
Dräger X-zone 5000: ON mode Dräger X-am 5x00: Switched on	Dräger X-am 5x00 is permanently supplied with power.
Dräger X-zone 5000: STANDBY mode Dräger X-am 5x00: Switched off	Dräger X-am 5x00 is supplied with power via trickle charging.
Dräger X-zone 5000: OFF mode Dräger X-am 5x00: Switched off	Dräger X-am 5x00 is not supplied with power.

Perform a function test with gas

> **⚠ CAUTION**
>
> A function test must be carried out on every device before use.

The function test can be carried out in two ways.

Function test for the Dräger X-am 5x00:

● Perform a function test in accordance with the instructions for use for the gas detection instrument before using with the Dräger X-zone 5000.

Function test on the Dräger X-am 5x00 in combination with the Dräger X-zone 5000:

> **NOTICE**
>
> The function test can only be carried out with the Dräger X-am 5x00 holder diffusion mode (order no. 83 20 636).
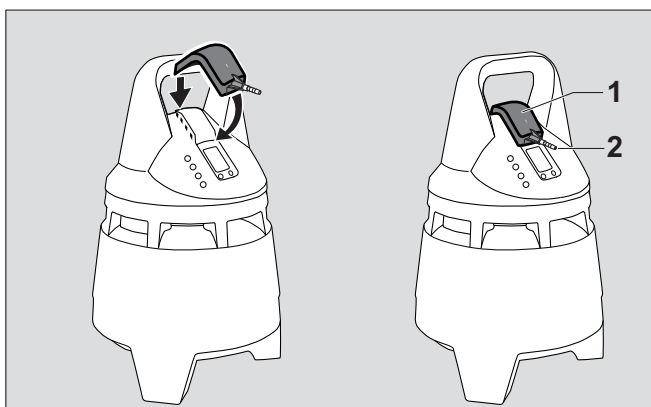
● Switching on Dräger X-zone 5000 (refer to "Switching on the instrument" on page 5).
● Place adapter (1) (order no. 83 20 108) on the holder (diffusion).
● Connect the test gas cylinder to the adapter (2).
● Open the test gas cylinder valve to let test gas flow over the sensors.
● Wait until the instrument displays the test gas concentration with sufficient tolerance:
    Ex: ±20 %[1]
    O_2: ±0.8 Vol.-%[1]
    TOX: ±20 %[1].
– Depending on the test gas concentration, alarm **A1** or **A2** is issued when the alarm thresholds are exceeded.
● Close the test gas cylinder valve and remove the adapter from the holder.

If the displays are outside of the above-mentioned ranges: Have the Dräger X-am 5x00 calibrated by service personnel.

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1) Upon application of the Dräger mixed gas (order no. 68 11 130) the displays should be within this range. Different concentrations can be set using the Dräger CC-Vision PC software provided.
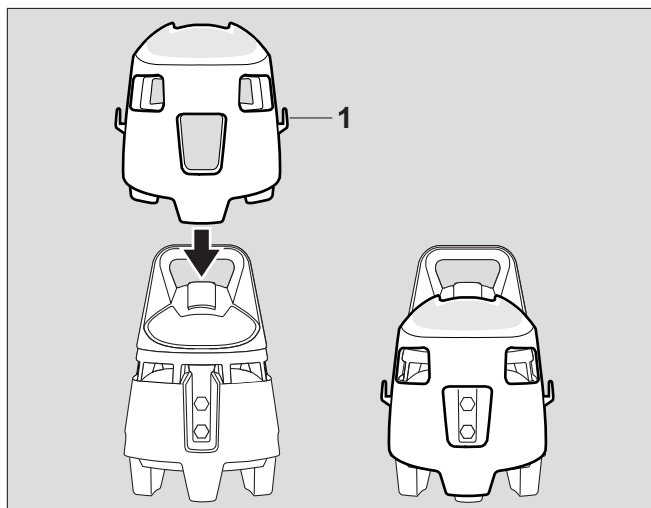
Perform a connection test

The connection test can be used to check the correct connection to all Dräger X-zone 5000 devices.
● Press the ⊛ key on of the the Dräger X-am 5x00 devices being used three times in succession.
A signal via a horn and LED ring is issued three times on every device connected wirelessly or via a cable.
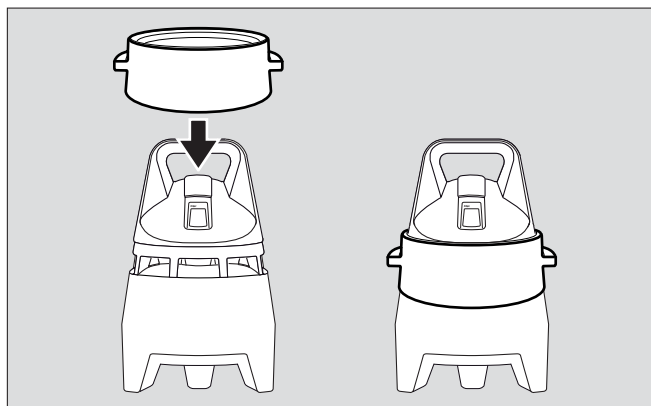
Safety housing

In exceptionally rough environments, and in very strong sunlight and high temperatures (> +40 °C), the use of the safety housing (order no. 83 21 519) is recommended.

1 Hose/cable holder

Alarm-attenuation ring

> **⚠ WARNING**
>
> The alarm-attenuation ring must not be used in explosion-hazard areas!

When switching on and off and during the function test of the Dräger X-zone 5000, Dräger recommends wearing hearing protection or using the alarm-attenuation ring (order no. 83 20 110) as the acoustic alarm is sounded for a short time.

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Establishing a wireless connection

> **⚠ WARNING**
>
> A maximum of 25 Dräger X-zone 5000 devices may be connected on a wireless network as otherwise it is not possible to ensure a reliable connection and alarm forwarding.

> **⚠ CAUTION**
>
> FCC and IC:
>
> This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
>
> – this device may not cause harmful interference, and
>
> – this device must accept any interference received, including interference that may cause undesired operation.
>
> Modifications not expressly approved by this company could void the user's authority to operate the equipment. The internal / external antennas used for this mobile transmitter must provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter. This device and its antenna must not be co-located or operating in conjunction with any other antenna or transmitter.

> *NOTICE*
>
> If the devices are in ON mode, they automatically establish the wireless connection.

Up to 25 devices can be connected on a wireless network via a wireless connection.

The typical radio range is up to 100 m in industrial surroundings (environmental factors may affect the range).

The devices can be operated in a chain, star or ring topology. It is possible to establish an open radio network or independent radio networks. All devices within radio range are automatically connected.

Open wireless network (standard configuration):

With an open wireless network, any number of Dräger X-zone 5000 devices (up to 25) can be added to or removed from a wireless network number.

Independent radio networks:

If independent radio networks are required, different network numbers need to be assigned for the relevant radio networks (refer to "Device configuration" on page 14).

Example:

Two independent radio networks each with three Dräger X-zone 5000 devices should be created. To do this, the Dräger CC-Vision PC software should be used to set NET:001 with three Dräger X-zone 5000 devices and NET:002 for three further Dräger X-zone 5000 devices.

Sub-networks:
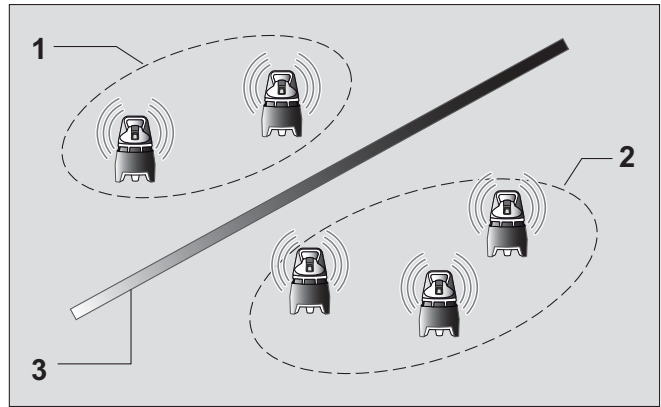
1   Sub-network 1
2   Sub-network 2
3   e. g. steel wall, wall, HGV, etc.

Sub-networks are created via an unintentional division of the open network into two or more radio networks. This can occur if the user is running two **activated** Dräger X-zone 5000 (with the same network number). This means that the devices have permanently interconnected wireless connection (data transmission LED is lit in green). This means that the user can no longer tell whether or not the wireless connection is already set up with the devices already installed. To avoid sub-networks, the Dräger X-zone 5000 devices should always be set up and switched on in succession.

Positioning the device:

> **⚠ CAUTION**
>
> Before positioning the devices, a function test (refer to "Perform a function test with gas" on page 7) must be conducted on every device.
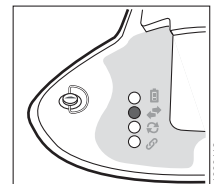
> *NOTICE*
>
> The gas supply must be connected at an angle of 360°. If required, use base (order no. 83 20 645) to raise the detection position by approx. 30 cm.

> *NOTICE*
>
> When positioning the devices, ensure that sub-networks are avoided.

● Switch on the first Dräger X-zone 5000 (refer to "Switching on the instrument" on page 5) and position at the relevant location.

● Switch on the second Dräger X-zone 5000 and position at a distance so that the data transmission LED is lit in green.

– The wireless connection is established and the data transmission LED indicates the connection to at least one device within radio range.

● Position other Dräger X-zone 5000 devices using the same process.
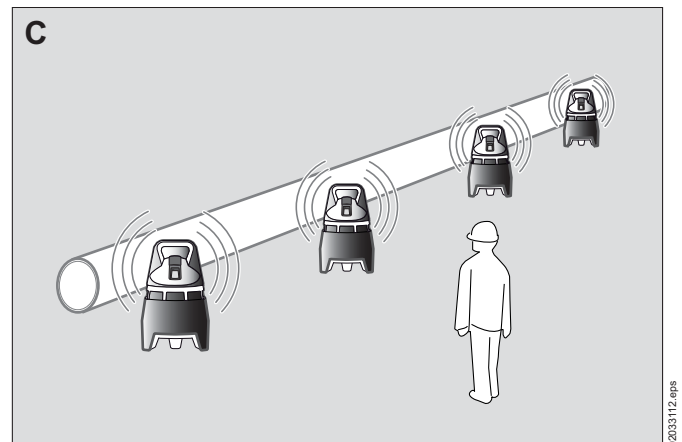
Examples of use:

Setting A:
Monitoring industrial tanks
(Wireless alarm chain)
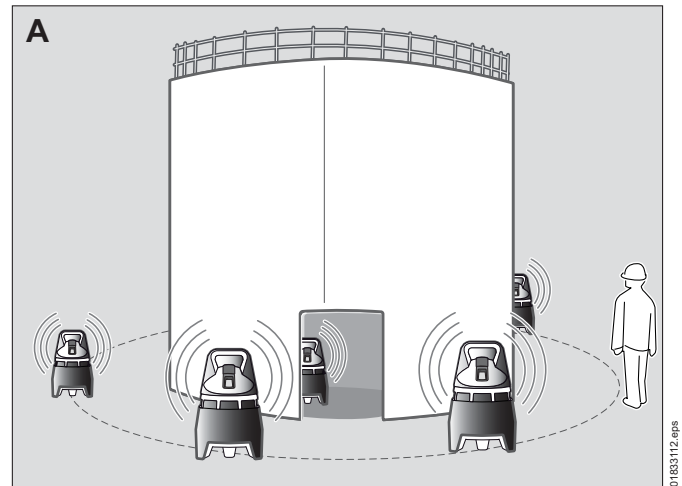
Setting B:
Area monitoring with pump
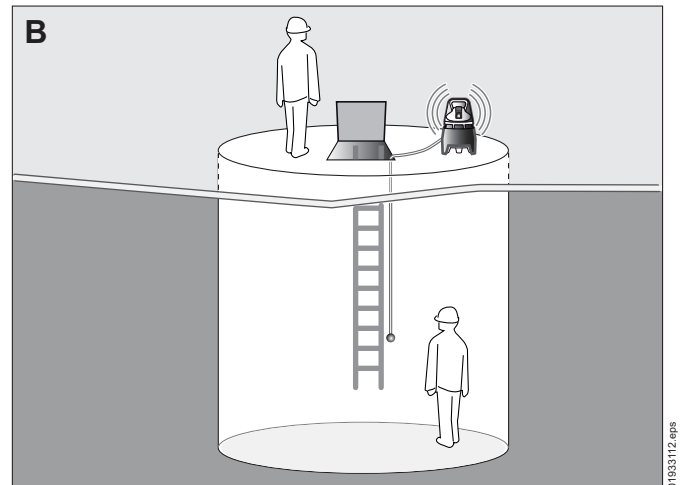
Setting C:
Radio monitoring of pipelines
(Wireless alarm chain)

Examples of use:

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Connecting devices via a cable connection

> **⚠ CAUTION**
> Before positioning the devices, a function test (refer to "Perform a function test with gas" on page 7) must be conducted on every device.
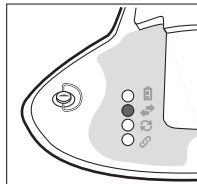
> *NOTICE*
> Due to widely differing customer-specific requirements, Dräger does not provide any communication cables. All relevant cable parameters are described in this chapter.

If radio connections are not allowed or blocked, the devices can be connected via communication cable. The maximum cable length between two devices is 25 m.

> *NOTICE*
> Combined wireless and cable operation is possible.
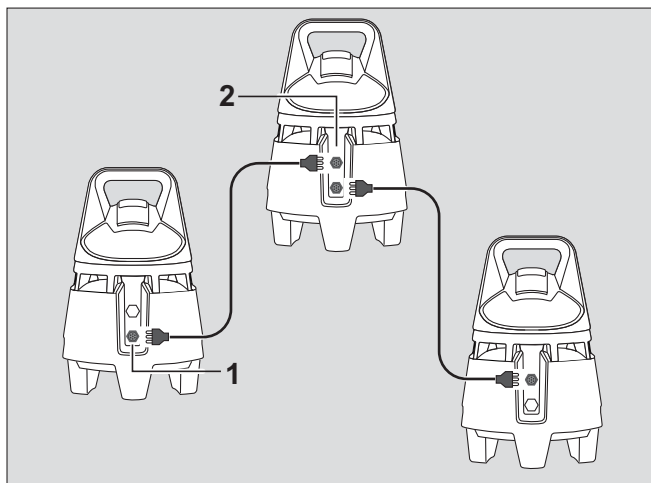
- Switching on Dräger X-zone 5000 (refer to "Switching on the instrument" on page 5).
- Plug the communication cable into the charging port/RS485 connection (1) on the rear side of the device.
- Connect the end of the communication cable to the switch relay/RS485 connection (2) of the second device.
– The data transmission LEDs of the coupled devices light green.

> **⚠ WARNING**
> If the data transmission LED is lit in red, check the cable connection.

- If required, connect further devices via communication cable as described above.

> *NOTICE*
> Dräger recommends performing a function test (refer to "Perform a connection test" on page 7) after positioning all the devices.

Pin configuration XEXT1 / XEXT2 on the device:

XEXT2 (male)
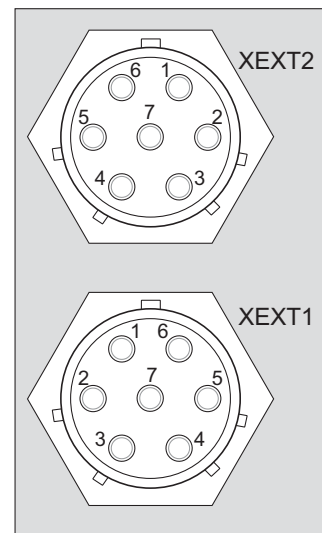
RS485
1 PLUS
2 MINUS
3 GND

Relay output
4 Normally Closed (NC)
5 Normally Open (NO)
6 Closed Only (CO)
7 GND

XEXT1 (female)
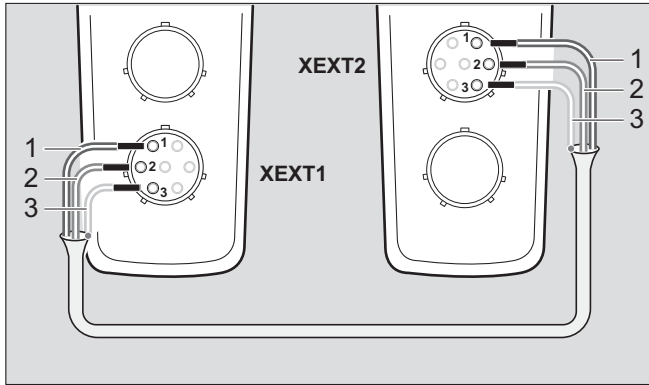
RS485
1 PLUS
2 MINUS
3 GND

Charger
4 Additional voltage (U-I_n)
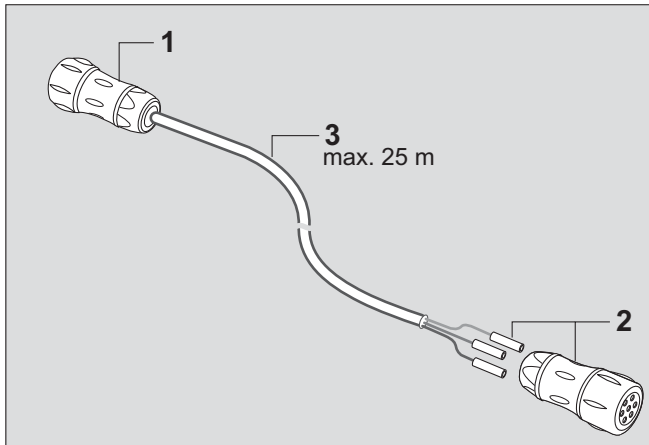5 GND2

RS485 connection:

⚠ CAUTION
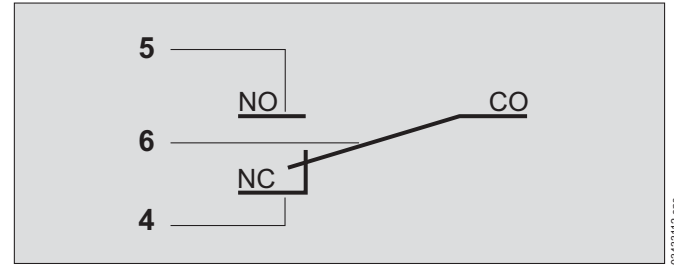
Ensure that the cable strands are not crossed!

1 Plug (male):
   Housing: Souriau UTS6JC147P (male)
   Contacts: Souriau RM20M12K (male)
2 Plug (female):
   Housing: Souriau UTS6JC147S (female)
   Contacts: Souriau RC20M12K (female)
3 Cable type: Belden 3107A, 2 x 2 AWG 22
   Cable length: max. 25 m between 2 devices

Relay output:

The relay output is intended for connection to an isolation amplifier with intrinsically safe output.
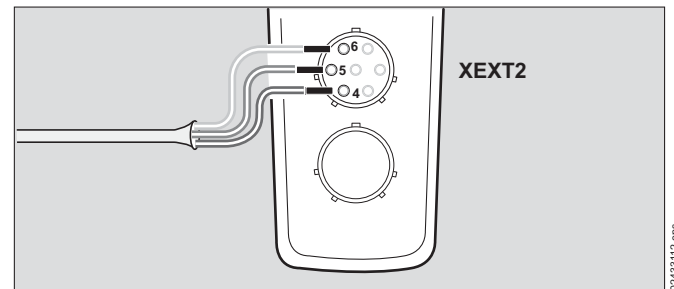
⚠ WARNING

It is essential that the parameters of the relay outputs are observed to prevent the circuit from jeopardising the intrinsic safety of the device.
Only intrinsically safe circuits are permitted for connection.

NOTICE

The person responsible for the use of the Dräger X-zone 5000 must prepare a system document to verify the intrinsic safety level.
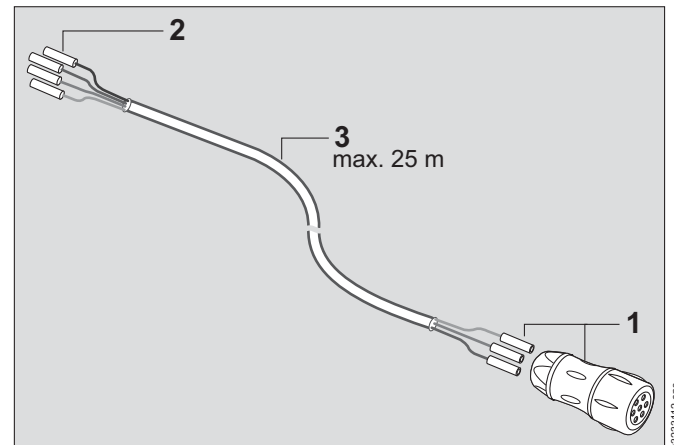
1 Plug (female):
   Housing: Souriau UTS6JC147S (female)
   Contacts: Souriau RC20M12K (female)
2 Configure the pin assignment separately depending on the application
3 Cable type: Belden 3107A, 2 x 2 AWG 22
   Cable length: max. 25 m between 2 devices

Connection of the relay output

Maximum voltage (U_i):	20 V
Maximum continuous current (I_i):	0.15 A
Maximum switching capacity (P_i):	3 W
For ohmic loads only:	
Reactances:	$C_i \leq 100$ pF $L_i \leq 10$ μH

During operation

During operation the values for each gas detected are displayed on the inserted Dräger X-am 5x00.

NOTICE
The displays on the Dräger X-am 5x00 are described in the instructions for use for the gas detection instrument being used.

The visual and acoustic life signal (LED ring green and single tone) is issued depending on the configuration (1 - 60 seconds; default setting every 2 seconds). The life signal can be configured using the Dräger CC-Vision PC software (refer to "Device configuration" on page 14).
In the event of an alarm, the visual and the audible alarm will be activated (refer to "Alarms (default settings)" on page 11).
The Dräger X-zone 500 will amplify the visual and audible alarm and will permanently transmit the alarm information, via a wireless connection or via cable, to further Dräger X-zone 5000 devices.

Alarms (default settings)

NOTICE
The alarm settings (e. g. self-latching/ acknowledgeable) can be configured using the Dräger CC-Vision PC software. The configuration of the Dräger X-am 5x00 is critical for the correct response of the Dräger X-zone 5000.

The Dräger X-zone 5000 is equipped with two different alarm generators:
– Visual signal: LED ring (360°);
  Colours red, green; pulsing.
– Acoustic signal: Intense horn (108 dB (A) in 1 m distance/120 dB (A) in 30 cm distance).

Triggering device:
As soon as a device detects an increased gas concentration, this device will become the triggering device.
The triggering device forwards the alarms to all connected devices wirelessly and/or via communication cable.

Receiving device:
All devices that receive an alarm from the triggering device become receiving devices. The receiving devices generate a seconary alarm. If the receiving device does not receive any information from the triggering device, the secondary alarm on the receiving devices is cancelled after 10 seconds.

NOTICE
The alarm-triggering device and the receiving devices give a different visual alarm.

Concentration pre-alarm A1

The alarm is indicated by an intermittent alarm message:

Display » A1 « and measured value alternating: not for O2!

– The pre-alarm A1 is not self-latching and stops when the concentration has dropped below alarm threshold A1.

The triggering device at A1:
– A single tone sounds and the LED ring flashes red (main alarm).

The receiving device at A1:
– A single tone sounds and the LED ring flashes red/green (seconary alarm).

Acknowledging the pre-alarm:
● Press ⊛ key on the Dräger X-am 5x00 of the triggering
Dräger X-zone 5000.
– Only the audible alarm will be switched off.

Concentration main alarm A2

⚠ DANGER
Danger to life! Leave the area immediately. A main alarm is self-latching and cannot be acknowledged (see Dräger X-am 5x00 Instructions for Use).

The alarm is indicated by an intermittent alarm message:

The triggering device at A2:
– A double tone sounds and the LED ring flashes red twice (main alarm).

A receiving device at A2:
– A double tone sounds and the LED ring flashes red/green twice (seconary alarm).

For O$_2$: A1 = lack of oxygen
A2 = excess oxygen

⚠ WARNING
Before the area may be entered again, a clearance measurement must be performed!

Only after the concentration has dropped below the alarm threshold A2:
● Press ⊛ key on the Dräger X-am 5x00 of the triggering
Dräger X-zone 5000.
– The alarm messages will be switched off.

Battery pre-alarm

The alarm is indicated by an intermittent alarm message:

Acknowledging the pre-alarm:
– The Battery LED flashes red.
● Press ⊛ key on the Dräger X-am 5x00 of the Dräger X-zone 5000, only the acoustic alarm is switched off.
– After the first battery pre-alarm the battery will last for another approx. 15 minutes.

Battery main alarm

The alarm is indicated by an intermittent alarm message:

The battery main alarm cannot be acknowledged acoustically:
– The Battery LED flashes red.
– The device automatically switches off after 10 seconds.
The visual and the audible alarm will be activated for a short time before the device switches off.

Device alarm

NOTICE
Indicates a malfunction of the Dräger X-zone 5000 or the Dräger X-am 5x00.

The alarm is indicated by an intermittent alarm message:
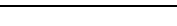
– The device or one or more sensor channels are not ready for operation.
– Remedies, refer to "Faults, Cause, Remedy" on page 15
● If necessary, commission the Dräger Safety Service Centre to eliminate the error.

Acknowledge the device alarm
● Press the ⊛ key on the Dräger X-am 5x00 or on the Dräger
X-zone 5000.

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Operation with pump (optional)

The Dräger X-zone 5000 is equipped with a pump as an option (refer to "Order List" on page 24.)

Commissioning and performing the measurement

> **⚠ CAUTION**
>
> Pump operation only with filter (order no. 83 19 359)! Otherwise there is a risk of damage to the pump.
> If no filter is used during pump operation, the warranty on the pump becomes invalid.

- Release the lock on the holder.
- Remove the holder.
- Press the ⊛ key of the Dräger X-zone 5000 and hold it for approx. 3 seconds.
- The Dräger X-zone 5000 is in STANDBY mode.
- Place the Dräger X-am 5x00 into the device receptacle.
- Place the holder (pump) onto the housing.
- Fasten the lock at the holder (pump).
- Switch on the Dräger X-am 5x00 in accordance with the instructions for use.
- If the device is in the ON mode, the pump will be automatically switched on via a switching contact on the holder (pump).
- Pump LED flashes red/green.

- Connect the sampling hose with the water trap for the hose set (order no. 68 05 473) and screw the connecting bush onto the filter in a clockwise direction.
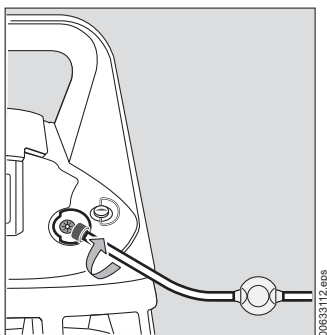
- A pump test will then need to be performed. The pump test will start automatically.

> **NOTICE**
>
> The pump test must be performed within 60 seconds otherwise a device alarm is issued.
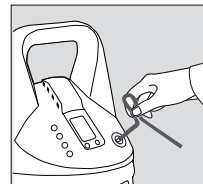
Pump test

> **NOTICE**
>
> Pump test is performed in the same way as for the Dräger pump
> X-am 1/2/5000. During the pump test, in the default setting the acoustic alarm is automatically reduced to 80 dB (A).
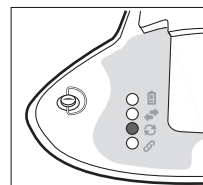
- The pump LED flashes red/green, accompanied by a signal tone.
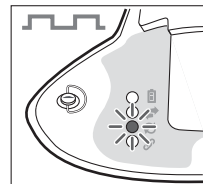
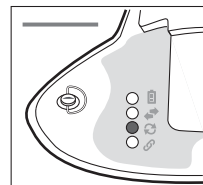- Seal or kink the intake flange or sampling hose for approx. 2 seconds.

- The pump LED lights red.
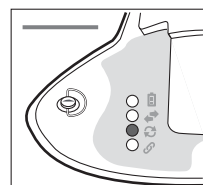- Unblock the intake flange/ sampling hose.

If the test was successful:

- The pump LED lights green, accompanied by an acoustic acknowledgment signal.

If the test was not successful:

- The pump LED lights red, accompanied by a continuous tone.
- The pump switches off automatically.

Ending operation

- Switch off the Dräger X-am 5x00 in accordance with the instructions for use.
- The visual and the audible alarm will be activated for a short time before the device switches off.
- The Dräger X-zone 5000 switches to STANDBY mode.
- Unscrew the sampling hose or the Dräger probe from the filter.
- Remove the holder (pump) by releasing the lock.
- The pump switches off.
- Place the holder onto the housing.
- Fasten the lock at the holder.

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## Observe the following during measuring mode with pump

- Wait for the flushing time to elapse:
  Before every measurement, flush the Dräger sampling hose or the Dräger probes with the air sample to be measured.
- A flushing phase is necessary to eliminate or minimise all effects associated with the use of a sampling hose or a probe, e. g. absorption in the hose, 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. Generally, when using a sampling hose (new, dry, clean), a typical flushing time of approx. 10 seconds is required for each metre. This flushing time applies in addition to the sensor response time (see the Instructions for Use for the gas detection instrument used).

Example:
- In the case of a 10 m sampling hose, the flushing time is approx. 100 seconds and the sensor response time is in addition approx. 60 seconds. Therefore, the total time before reading the gas detection instrument is approx. 90 seconds.
- The flow-rate alarm is delayed by 10 to 30 seconds depending on the length of the hose.

Replacing the filter

- Unscrew the connecting bush from the filter.
- Unfasten the lock at the holder (pump).
- Remove the holder (pump).

- Unscrew the filter anti-clockwise.
- Screw a new filter (order no. 83 19 359) onto the device in a clockwise direction.
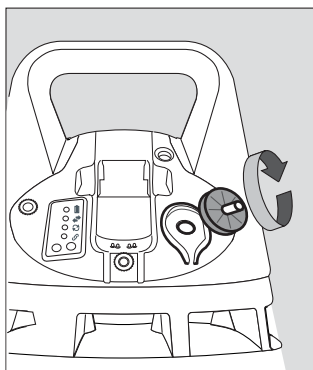
- Place the holder (pump) onto the housing.
- Fasten the lock at the holder (pump).
- Screw the connecting bush onto the new filter.

Device configuration
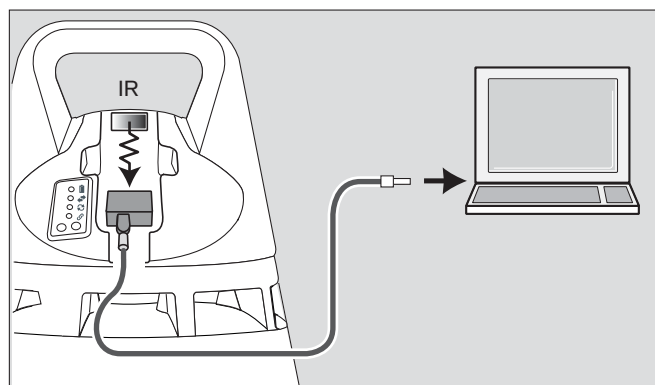
To individually configure a standard-configuration device, connect the device to a PC.
Communication is carried out via the USB DIRA dongle (order no. 83 17 409).

The Dräger CC-Vision PC software is used to perform the configuration.
The following settings can be configured, among others:
- Horn volume
- Wireless function
- Alarm frequencies
- Alarm pattern
- Alarm forwarding
- Life signal (light pattern, horn volume)
- Bump test volume
  (Default setting: 80 dB (A))
- Actions of the switch relay

NOTICE
Observe the documentation and online help of Dräger CC Vision PC software.

NOTICE
A Dräger CC Vision version, which can be used for Dräger X-zone 5000 PC software, is supplied with the device on CD-ROM.

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Faults, Cause, Remedy

Fault	Cause	Remedy
Dräger X-zone 5000 cannot be loaded.	Charging unit plug is not in correct contact with the Dräger X-zone 5000.	Ensure that the charging unit plug is correctly plugged in. Check the battery LED.
Battery service life is low.	Battery is not fully charged.	Load battery for at least 12 h.
	Battery not regularly charged.	Charge battery regularly even when switched off, at least every 2 months.
	Outdoor temperature is too low.	Warm up Dräger X-zone 5000.
	Outdoor temperature is very high.	Use safety housing where appropriate.
	Battery is faulty.	Have the battery checked by the Dräger service department.
	Inductive charging is not functioning correctly as the distance between the Dräger X-zone 5000 and the charging station is too great.	Check the distance, remove any dirt if necessary.
No wireless connection between the Dräger X-zone 5000 devices.	Wireless function is not activated.	Activate the wireless function using the Dräger CC-Vision PC software (refer to "Device configuration" on page 14).
	Dräger X-zone 5000 devices are very far apart.	Position the Dräger X-zone 5000 devices more closely together. Position additional devices in the chain. Place Dräger X-zone 5000 at a higher position, use base (order no. 83 20 645) where appropriate.
	The wireless connection is made more difficult by an industrial environment: e. g. steel walls.	Position the Dräger X-zone 5000 devices more closely together. Position additional devices in the chain.
		Connect the Dräger X-zone 5000 with a communication cable (refer to "Connecting devices via a cable connection" on page 9).
	Dräger X-zone 5000 are covered by conductive materials (e. g. metal grids).	Ensure there are no obstructions.
	Network number of the Dräger X-zone 5000 is different.	Use Dräger X-zone 5000 devices with the same network numbers. The network number can be configured using the Dräger CC-Vision PC software (refer to "Device configuration" on page 14).
	Wireless frequency of the Dräger X-zone 5000 devices is different.	Use Dräger X-zone 5000 devices with the same radio frequency.
Cable connection is not functioning.	Cable plug is not correctly plugged in, cable assignment is incorrect or cable is broken.	Check cable connection and assignment. Ensure that the cable plug is correctly plugged in.
Alarm contact is not switching.	Cable plug is not correctly plugged in, cable assignment is incorrect or cable is broken.	Check cable connection and assignment. Ensure that the cable plug is correctly plugged in.
Pump operation is not functioning.	Incorrect holder (diffusion) in position.	Position the holder (pump).

Fault	Cause	Remedy
Pump fault during operation.	Condensate formation with cold and damp intake air.	Use hose set with water trap (order no. 83 21 527).
	Pump outside the specified range.	Have the pump checked by the Dräger service department.
Function test has failed.	Incorrect holder (pump) in position.	Use holder (diffusion).
	Adapter is incorrectly positioned on the holder (diffusion).	Position adapter correctly on the holder (diffusion) (refer to "Perform a function test with gas" on page 7).
Flow test has failed.	Flow test has not been performed.	Perform flow test, repeat if necessary.
	Holder (pump) is not correctly positioned.	Re-position holder (pump) and check that it is correctly fitted.
Horn is too quiet.	Volume is set too low.	Set the volume using the Dräger CC-Vision PC software (refer to "Device configuration" on page 14).
Optical alarm signals not visible or poorly visible.	Configuration or pattern incorrectly set.	Configure the alarm signals using the Dräger CC-Vision PC software (refer to "Device configuration" on page 14).
Life signal is not functioning.	Configuration is set incorrectly.	Configure the life signal using the Dräger CC-Vision PC software (refer to "Device configuration" on page 14).
Gas detection instrument not detected.	IR interface dirty.	Clean IR interface.
	Incompatible gas detection instrument.	Use Dräger X-am 5x00.
	Incorrect software version in the gas detection instrument.	Have a software update performed by the Dräger service department.
	IR interface faulty, clip on gas detection instrument not correctly positioned.	Close clip on Dräger X-am 5x00.
	Holder is not correctly positioned.	Re-position holder and check that it is correctly fitted.
Dräger X-am 5x00 switches off quickly; no power supply.	Power contacts dirty or damp.	Clean power contacts.
Device defect displayed.	Dräger X-am 5x00 moved away from Dräger X-zone 5000 during operation.	Acknowledge alarm on Dräger X-zone 5000, switch off Dräger X-zone 5000.

Fault messages

Special symbol » ⊠ « and displayed numerical code:	Cause	Remedy
01	Dräger X-am 5x00 with alkali supply unit.	Insert Dräger X-am 5x00 with battery power pack.
02	Communication interrupted with Dräger X-zone 5000.	Check IR interface on Dräger X-zone 5000 and on Dräger X-am 5x00.
03	Communication error with battery controller Dräger X-zone 5000.	Contact Dräger service department.
04	Main battery alarm Dräger X-am 5x00.	Check charging contacts on Dräger X-zone 5000 and on Dräger X-am 5x00.
05	Battery pre-alarm Dräger X-am 5x00.	Check charging contacts on Dräger X-zone 5000 and on Dräger X-am 5x00.
06	Dräger X-am 5x00 charging current too low.	Check charging contacts on Dräger X-zone 5000 and on Dräger X-am 5x00.
07	Holder (pump) detected, but no pump fitted.	Use holder for diffusion mode.
08	Flow fault	Check intake hose.
09	Holder status change (pump) during operation.	Check that the holder (pump) is securely positioned.
10	Check sum error program code	Contact Dräger service department.
11	Check sum error operating parameter	Contact Dräger service department.
12	Check sum error operating parameter	Contact Dräger service department.
13	Check sum error operating parameter	Contact Dräger service department.
14	Working memory test error	Contact Dräger service department.
15	Faulty ADC conversion.	Contact Dräger service department.
16	No contact with switch box in grouping mode.	Check wireless connection to switch box.
17	Charging electronics faulty.	Contact Dräger service department.
18	Battery completely discharged.	Charge Dräger X-zone 5000.
19	Battery main alarm of the Dräger X-zone 5000.	Charge Dräger X-zone 5000.
20	Battery pre-alarm of the Dräger X-zone 5000.	Charge Dräger X-zone 5000.
21	Dräger X-am5x00 device error.	Check Dräger X-am 5x00.
22	Dräger X-am5x00 alarm pattern faulty.	Contact Dräger service department.
23 - X28	-	-
29	Battery main alarm	Charge Dräger X-zone 5000.
30	Battery completely discharged.	Charge Dräger X-zone 5000.
31	Charging electronics faulty.	Contact Dräger service department.
32	Communication error with battery controller Dräger X-zone 5000.	Contact Dräger service department.

Maintenance

Maintenance intervals

The device should be inspected annually by suitably qualified personnel.
- Charge the lead battery after each application, at the latest however after the battery alarm has been triggered.
- Maintenance by suitably qualified personnel – 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 Safety and that repairs also be carried out by Dräger.

NOTICE
For the gas detection instruments used, the maintenance intervals specified in the relevant instructions for use apply.

Replacing the batteries

⚠ **WARNING**
Explosion hazard! Do not replace the batteries in areas subject to explosion hazard! Batteries are part of the Ex approval.

Only the following types may be used:
– Battery pack, small - order no. 83 20 644
– Battery pack, large - order no. 83 20 646

- Switch off the device (refer to "Switching off the device" on page 6).

- Unfasten the screws (M5 cylinder-head screw with internal hexagon) on the bottom side of the housing.
- Lift the upper part of the housing and disconnect the plug connection from the bottom plate.
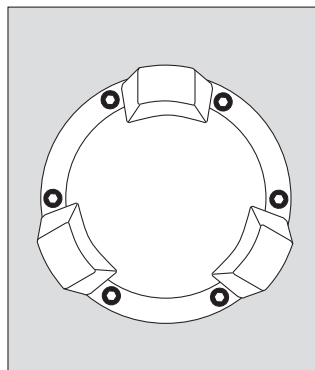
- Release the four M5 nuts.
- Disconnect the cable connections from the bottom plate.
- Replace the old battery block with a new one.
- Re-establish the cable connection to the bottom plate.
- Check the correct position of the O-ring.
- Tighten the four M5 nuts.
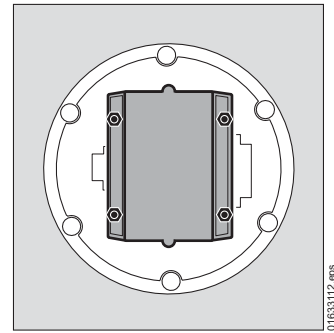
- Establish plug connection to the bottom plate.
- Place the upper part of the housing on the bottom part
  (Note preferred position).
- Tighten the screws (M5 cylinder-head screw with internal hexagon) at the housing bottom (120 Ncm ±20 Ncm).

NOTICE
It is recommended to fully charge the device after the battery block has been replaced.

⚠ **WARNING**
Explosion hazard! Do not throw used batteries into a fire and do not open them with force. Dispose of the batteries in accordance with national regulations.

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Charging the batteries

> **⚠ WARNING**
>
> Explosion hazard!
> Do not charge underground or in explosion-hazard areas.
> The chargers are not designed in accordance with the guidelines for firedamp and explosion protection.

> **⚠ CAUTION**
>
> Mains powered charging station should only be handled by persons wearing implants if the pacemakers and active implants conform to the relevant legal requirements. Dräger only guarantees conformity with Directive 2004/108/EC.

> *NOTICE*
>
> The transmitter coil of the inductive charging station generates a weak magnetic alternating field. During operation, all requirements of the relevant standards regarding electromagnetic faults are observed. The legal requirements of Directive 2004/108/EC are met.

> *NOTICE*
>
> The warranty on the battery becomes null and void if the device is not fully charged at least every 2 months when not in use.
> Dräger recommends storing devices in the charging station (order no. 83 20 626) even when not in use.

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 is automatically interrupted and automatically continued after the temperature range has been reached again.

During the charging, the battery LED flashes red, red/green or green, depending on the battery status, at a frequency of one Hz. As soon as the charging is completed, the battery LED will permanently light green.

Inductive charging

- Connect the charging station to the mains using the power pack.
- Place the device onto the charging station.
- The charging time is typically < 10 hours.

Cabled charging

- Plug the charging cable into the charging port on the rear side of the device.
- Connect the power pack to the mains.
- The charging time is typically < 14 hours.

> *NOTICE*
>
> Dräger recommends storing devices that are not in use in the charging station (order no. 83 20 626).

Care

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.
- Carefully dry the device using a cloth.

Disposing of the device

Disposing of electric and electronic equipment:

EC-wide regulations for the disposal of electric and electronic appliances which have been defined in the EC Directive 2002/96/EC and in national laws have been effective since August 2005 and apply to this instrument.

Special collecting and recycling options have been established for households. However, as this device has not been registered for household usage, it must not be disposed of through these means. The device can be returned to your national Dräger Sales Organisation for disposal. Please do not hesitate to contact the above if you have any further questions on this issue.

Technical Data

Dimensions:	approx. 490 x 300 x 300 mm (H x W D)	**Relay output:**	
Weight:		Max. voltage (U_i):	20 V
with battery, 12 Ah	approx. 7 kg	Max. switching current (I_i):	0.25 A / 0.25 A
with battery, 24 Ah	approx. 10 kg	Max. continuous current:	3 W
Ambient conditions:		Max. switching capacity (P_i):	$C_i \leq 100$ pF; $L_i \leq 10$ µH
During operation	-20 °C to +50 °C		
During storage	-20 °C to +70 °C	For ohmic loads only: Reactances	Capacitive or inductive loads
	700 to 1300 hPa		
	max. 95% relative humidity	No connection with:	
Alarms:			
Visual, 360° LED	green life signal; red life signal; green/red subsidiary alarm	**Approvals:**	
		ATEX:	I M1 Ex ia I Ma
			II 1G Ex ia IIC T3 Ga
Audible, 360°	108 dB (A) at 1 m distance		
	120 dB (A) at 30 cm distance	IECEx:	Ex ia I Ma
Battery:			Ex ia IIC T3 Gb
Operating time, 12 Ah (≥ 20 °C)	60 Hours at 15 minute alarm per day and , fully equipped Dräger X-am 5x00	**Detection range:**	see the Technical Manual for Dräger X-am 5x00
Operating time, 24 Ah (≥ 20 °C)	120 hours		
Charging time, 12 Ah	< 6 hours		
Charging time, 24 Ah	< 10 hours		

Frequency ranges:

Country, region	Frequency range (MHz)
EU, Switzerland, Norway, Turkey	868
South Africa	868
USA/Canada	915
Singapore	868
Australia	915
India	915
Japan	429
Russia	433

Pump: up to 30 m hose 0.5 l/min

Networking of devices: Only service department can switch the frequency 429/433/868/915 MHz with a typical range of 100 m in industrial surroundings (environmental factors may affect the range).

Automatic establishment of wireless connection.

Up to 25 devices can be connected on a wireless network.

Combined wireless/cable operation possible.

Key allocation of Dräger X-zone 5000

The following key functions refer to the keys of the Dräger X-zone 5000 located underneath the holder.

Action	Meaning
Pressing ⊛ key once	Acknowledges Dräger X-zone 5000 device defect
Pressing ⊛ key once	Acknowledges Dräger X-zone 5000 battery pre-alarm
Pressing and holding ⊛ key for 3 sec	Switches from OFF to STANDBY mode.
Pressing ⊕ key once	- Switches to grouping mode, possible in ON or STANDBY mode. - During grouping mode: Exits grouping mode.
Pressing and holding ⊛ and ⊕ key for 3 sec	Switches to the OFF mode.
Pressing and holding ⊕ key for 3 sec	Deletes the grouping information.

Status LED Overview

🔋 Battery LED

(Indicates the battery status.)

Colour	LED status	Device mode	Meaning
● 🔋 off	off	OFF mode	Device is switched off.
● 🔋 green			Battery capacity of more than 66 %.
◕ 🔋 red/green	on	ON/STANDBY mode	Battery capacity of more than 33 %.
● 🔋 red			Battery capacity of less than 33 %.
☀ 🔋 red	⎍‾⎍‾⎍	ON/STANDBY mode	Battery pre-alarm
☀ 🔋 red	⎍⎍⎍⎍⎍		Battery main alarm; Dräger X-zone 5000 switches off after 10 sec.
☀ 🔋 red	⎍⎍⎍⎍⎍	OFF mode	Attempt to switch on in OFF mode when the battery is empty (on for 10 s).
☀ 🔋 red	⎍⎍⎍⎍‾		Dräger X-Zone 5000 **is being charged**, battery capacity less than 33 %.
☀ 🔋 red/green	⎍⎍⎍⎍‾	ON/STANDBY mode in charging station	Dräger X-Zone 5000 **is being charged**, battery capacity between 33 % and 66 %.
☀ 🔋 green	⎍⎍⎍⎍‾		Dräger X-Zone 5000 **is being charged**, battery capacity greater than 66 %.
● 🔋 green	‾‾‾⎍‾‾		Dräger X-zone 5000 is **fully charged**.

⇄ Data transmission LED

(Indicates the connection status if multiple devices are coupled via wireless connection or communication cable.)

Colour	LED status	Device mode	Meaning
● ⇄ off	off	ON/STANDBY mode	Wireless connection deactivated.
● ⇄ green			At least 1 other Dräger X-zone 5000 coupled via wireless connection or cable is detected.
● ⇄ red	on	ON mode	No other Dräger X-zone 5000 coupled via wireless or cable connection is detected.

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↻ Pump LED

(Indicates the pump status.)

Colour	LED status	Device mode	Meaning
● ↻ off	off	STANDBY mode	Device is in STANDBY mode.
● ↻ off			No pump adapter detected.
☀ ↻ red/green	⎍⎍⎍⎍		Flow test required.
☀ ↻ red	⊓⊓⊓⊓⊓⊓	ON mode	Performing flow test.
● ↻ green	on		Flow test successful/pump is running.
● ↻ red			Flow error (e. g. due to lack of volume flow or no flow test).

🔗 Grouping LED

Not currently active - for use with future functions!

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Overview of LED Ring and Horn Signals

Signal name	LED ring	Horn
OFF mode	Off	Off
Switch-on signal and switch-off signal	All red LEDs on for 1 s, then all green LEDs on for 1 s and all status LEDs on for 1 s.	Continuous tone for 1 s with reduced[1] volume
Dräger X-zone 5000 device defect, triggering device[2]	Intermittent triple flashing of the red LEDs	Intermittent triple tone at full [3] volume
Concentration main alarm, triggering device[2]	Intermittent double flashing of the red LEDs	Intermittent double tone at full volume[3]
Concentration pre-alarm, triggering device[2]	Intermittent single flashing of the red LEDs	Intermittent single tone at full [3] volume
Dräger X-zone 5000 device defect, receiving device[4]	Intermittent triple flashing of the red+green LEDs[5]	Intermittent triple tone at full [3] volume [5]
Concentration pre-alarm, receiving device[4]	Intermittent double flashing of the red and green LEDs[5]	Intermittent triple tone at full [2] volume [5]
Concentration main alarm, receiving device[4]	Intermittent single flashing of the red and green LEDs[5]	Intermittent triple tone at full [1] volume [5]
Acknowledgment signal	-	Sustained single tone at full [1] volume
Prompting signal	-	Intermittent (1 Hz) single tone at reduced[1] volume
Life signal (suppressed in pump test)	Intermittent single flashing of the green LEDs	Intermittent single tone at full [3] volume[6]
Switching on at battery capacity < battery main alarm	-	Intermittent triple tone at reduced[1] volume
Battery pre-alarm of the Dräger X-zone 5000	Intermittent triple flashing of the red LEDs	Intermittent triple tone at full [3] volume
Battery main alarm of the Dräger X-zone 5000	Intermittent triple flashing of the red LEDs for 10 s, after that the Dräger X-zone 5000 switches to the OFF mode	Intermittent double tone with full[3] volume for 10 s, afterwards the Dräger X-zone 5000 does to OFF mode
Flow test prompt	1 Hz red	Intermittent (1 Hz) single tone.
flow test running	-	-
Flow test successful	LED ring green for 2 s	-

1) Reduced volume for hearing protection: 80 dB (A) (default setting), the reduced volume must not exceed the "full" volume configured by the customer.
2) Device that triggered the alarm.
3) Full volume: Maximum volume configured by the customer (e. g. 108 dB (A)).
4) Device that has received the alarm from the triggering device.
5) If user has activated the forwarding of defects from the receiving device.
6) Frequency according to the user configuration.

Order List

Name and Description	Order No.
Dräger X-zone 5000, 868 MHz, 12 Ah	83 20 740
Dräger X-zone 5000, 868 MHz, 24 Ah	83 20 741
Dräger X-zone 5000, 868 MHz, 12 Ah, pump	83 20 742
Dräger X-zone 5000, 868 MHz, 24 Ah, pump	83 20 743
Dräger X-zone 5000, 915 MHz, 12 Ah	83 20 744
Dräger X-zone 5000, 915 MHz, 24 Ah	83 20 745
Dräger X-zone 5000, 915 MHz, 12 Ah, pump	83 20 746
Dräger X-zone 5000, 915 MHz, 24 Ah, pump	83 20 747
Dräger X-zone 5000, 433 MHz, 12 Ah	83 20 104
Dräger X-zone 5000, 433 MHz, 24 Ah	83 20 105
Dräger X-zone 5000, 433 MHz, 12 Ah, pump	83 20 106
Dräger X-zone 5000, 433 MHz, 24 Ah, pump	83 20 107
Dräger X-zone 5000, 429 MHz, 12 Ah	83 20 710
Dräger X-zone 5000, 429 MHz, 24 Ah	83 20 711
Dräger X-zone 5000, 429 MHz, 12 Ah, pump	83 20 712
Dräger X-zone 5000, 429 MHz, 24 Ah, pump	83 20 713

Name and Description	Order No.
Chargers:	
Inductive charging station	83 20 626
Plug charger	83 20 749
Accessories:	
Battery pack, small (Dräger X-zone 5000)	83 20 644
Battery pack, large (Dräger X-zone 5000)	83 20 646
Alarm-attenuation ring (Dräger X-zone 5000)	83 20 110
Safety housing (Dräger X-zone 5000)	83 21 519
Base (Dräger X-zone 5000)	83 20 645
Holder Dräger X-am 5x00 - Diffusion (Dräger X-zone 5000)	83 20 636
Holder Dräger X-am 5x00 - Pump (Dräger X-Zone 5000)	83 20 704
Adapter (Dräger X-zone 5000)	83 20 108
Cap for charging and communication socket	18 93 632
USB DIRA with USB cable (USB infrared adapter for Dräger X-zone 5000 – PC communication)	83 17 409
Pump accessories	
Hose set (water trap, 10 cm Viton hose, filter)	83 21 527
Filter, pump	83 19 359
Water trap	68 05 473
Float probe with accessories	83 18 371
Viton hose	12 03 150
Rubber hose (not suitable for H_2S)	11 80 681
Tygon hose	83 20 395