Dräger Polytron 8000
Instructions for Use

WARNING

Strictly follow the Instructions for Use.
The user must fully understand and strictly observe the instructions. Use the product only for the purposes specified in the Intended use section of this document.

Contents

1 For your safety

1.1 General safety instructions

- Before using the product, carefully read the Instructions for Use.
- Strictly follow the Instructions for Use. The user must fully understand and strictly observe the instructions. Use the product only for the purposes specified in the Intended use section of this document.
- Do not dispose of the Instructions for Use. Ensure that they are retained and appropriately used by the product user.
- Only fully trained and competent users are permitted to use this product.
- Comply with all local and national rules and regulations associated with this product.
- Only trained and competent personnel are permitted to inspect, repair and service the product as detailed in these Instructions for Use. Further maintenance work that is not detailed in these Instructions for Use must only be carried out by Dräger or personnel qualified by Dräger. Dräger recommend a Dräger service contract for all maintenance activities.
- Properly trained service personnel must inspect and service this product as detailed in the Maintenance section of this document.
- Use only genuine Dräger spare parts and accessories. Otherwise, the proper functioning of the product may be impaired.
- Do not use a faulty or incomplete product, and do not modify the product.
- The flameproof threads for the explosion proof enclosure do not conform to the minimum/maximum values in EN/IEC 60079-1. The threads must not be modified by the user.
- The measuring function of the gas measurement transmitter for explosion protection according to Annex II, Sections 1.5.5, 1.5.6 and 1.5.7 of Directive 94/9/EC is not covered at present.
- Exchanging components may compromise the intrinsic safety. This only applies if the device is intrinsically safe.
- Only operate the product within the framework of a risk-based alarm signaling concept.

Safe connection to 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 devices 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.

1.2 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:

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.

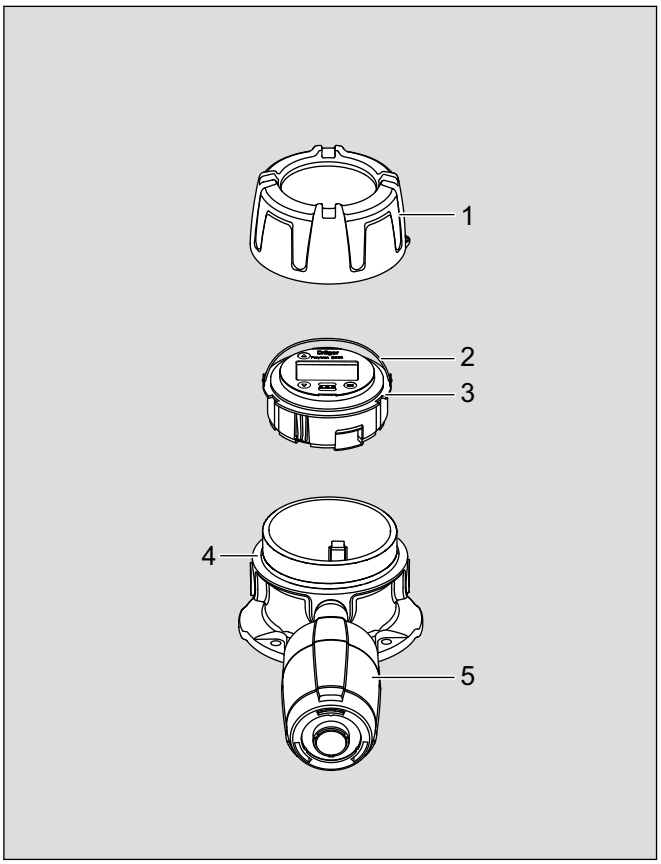
NOTICE

Indicates additional information on how to use the product.

2 Description

2.1 Product overview

2.1.1 Explosion proof device



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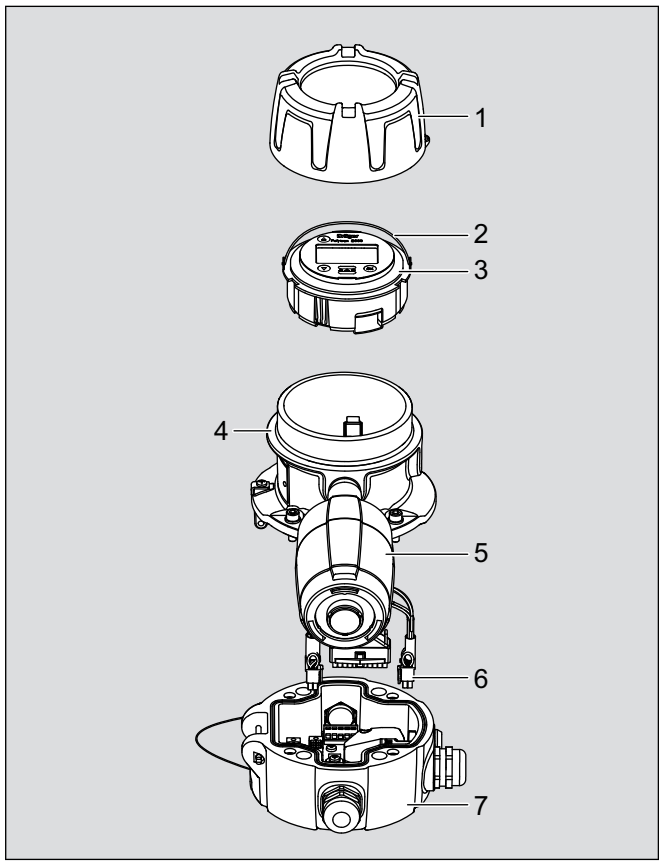
1 Housing cover
2 Handle
3 Enclosure with main electronics (and optional relay)
4 Lower part of housing
5 Sensor
6 Assembled device

2.1.2 Explosion proof device with e-Box for increased safety



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1 Housing cover
2 Handle
3 Enclosure with main electronics (and optional relay)
4 Lower part of housing
5 Sensor
6 Feed through cable
7 e-Box
8 Assembled device

2.2 Functional description

2.2.1 Principle of operation of the DrägerSensor® [1] EC

The electrochemical DrägerSensor EC are electrochemical transducers for measuring the partial pressure of a gas under atmospheric conditions.

The ambient air diffuses through a membrane in the liquid electrolyte of the sensor. A measuring electrode, a counter-electrode and a reference electrode are in the electrolyte. An electronic potentiostat circuit maintains a constant electrical voltage between the measuring electrode and the reference electrode. The voltage, the electrode and the electrode material are selected to enable the monitored gas to be electrochemically converted at the measuring electrode. The electrons flowing during the reaction are a gauge for the gas concentration. There is an electrochemical reaction with oxygen from the ambient air at the counter electrode at the same time.

2.3 Intended use

The Dräger Polytron 8000 is an explosion-proof device for continuous monitoring of toxic gases or oxygen in the ambient air, corresponding to the integrated DrägerSensor. The housing for the device consists of robust, non-corroding stainless steel or aluminum and is suitable for indoor or outdoor applications. The unit can be connected to a Dräger monitoring system or a programmable logic controller (PLC) by means of a sealed conduit or an appropriately approved cable gland. With the optionally integrated relay module, the device can be operated without a central controller (with additional local alarm signaling). The device is designed for fixed installation and is approved for use in potentially explosive atmospheres, see chapter 2.5 on page 6.

WARNING

Not tested in environments with an elevated oxygen content (>21 % O_2).

Danger of explosions! Do not use in environments with an elevated oxygen content. None of the Polytron 8000 instruments is certified or approved for operation in environments with an elevated oxygen content.

2.4 Intended area and conditions of use

Hazard areas classified into zones:
The device is only designed for use in Zone 1 or Zone 2 potentially explosive atmospheres for which a temperature range as specified on the device must be observed and in which gases of Explosion Groups IIA, IIB or IIC and Temperature Classes T4 or T6 (depending on maximum ambient temperature) or dust of Groups IIIA, IIIB or IIIC may occur. The temperature range specified for the device must be observed.

Hazard areas classified into divisions:
The device is only designed for use in potentially explosive atmospheres of Classes I&II, Div. 1 or 2, in which gases or dust of Groups A, B, C, D or E, F, G and Temperature Classes T4 or T6 (depending on maximum ambient temperature) may occur. The temperature range specified for the device must be observed.

2.5 Approvals

See printed version for device marking.

2.6 Device marking

The device marking is supplied with the device as a copy on a separate document.

Key to the Serial Number: The third letter of the Serial Number specifies the year of manufacture: D = 2012, E = 2013, F = 2014, H = 2015, J = 2016, K = 2017 etc.
Example: Serial Number ARDH-0054: The third letter is D, i.e. the device was manufactured in 2012.

1 DrägerService® is a registered trademark of Dräger.

3 Installation

3.1 General information for the installation

The selection of a suitable mounting location is crucial for the effectiveness and performance of the entire system. Every detail of the installation must be thoroughly thought out. The following must be noted in particular:

- The local and national rules and regulations for the installation of gas measuring systems.
- The applicable regulations for running and connecting power and signal cables to gas measuring systems.
- The full extent of environmental influences to which the device will be subjected.
- The physical properties of the gases and vapors to be measured.
- The details of the particular application (e.g., potential leaks, air movements/flows, etc.).
- accessibility for required maintenance activities.
- The geometric of the accessories that are used with the system.
- All other limiting factors and stipulations that may affect the installation of the system.
- For installation without a conduit, an approved cable gland (e.g. Hawke A501/421/A/¾" NPT or equivalent) must be used (see chapter 12 on page 31). To increase the RF interference immunity, it may be necessary to connect the cable screen to the cable gland and to the control unit.
- The explosion proof enclosure has three ¾" NPT connections, which can be used for field wiring, the direct attachment of a sensor or wiring an external sensor. Unused openings must be closed off with a plug. For the correct tightening torques for cable bushings, plugs, sensors and connectors, see chapter 12 on page 31.
- The secondary circuit is supposed to be supplied from an isolating source (does not apply to relay contacts).
- The optional e-Box has up to four 20 mm connections, which can be used for field wiring or wiring an external sensor. The permissible cable diameter is 7 to 12 mm.
- If the device is installed in locations where ambient temperatures of over 55 °C prevail, appropriate cables which are specified for use at temperatures of 25 °C above the maximum ambient temperature must be used.
- Strip back the insulation on conductors by 5 to 7 mm.
- Connect the cable as shown in chapter 3.5 on page 8 (shown here also with protective ground) or chapter 3.6 on page 9.
- The connecting wires for the optional relay module must be selected and fused according to the rated voltages, currents and environmental conditions.
- When stranded conductors are used, an end ferrule must also be used.

3.2 Restrictions on the installation

- The device requires a DC voltage between 10 and 30 V. The minimum supply voltage of 10 V and the cross-section of the conductors used determine the distance of the device from the supply or the central controller (see chapter 12 on page 31). The device is designed for cables of size 12 to 24 AWG (0.2 to 2.5 mm^2). Use a three-wire, screened cable as a minimum.
- The device must not be subjected to any radiant heat (e.g. direct sunlight) as this will result in a temperature rise above the specified thresholds (see chapter 12 on page 31). The use of a reflective screen is recommended.
- The housing is weather resistant and suitable for outdoor applications. The use of the optional splash guard is recommended to protect the sensor from water and dust.
- The device must be installed and operated in an environment which conforms to the stated specifications (see chapter 12 on page 31).
- To insure proper operation of the device, the impedance of the 4 to 20 mA signal loop must not exceed 500 ohms. Depending on the operating voltage and according to the application (e.g. HART operation), certain minimum impedances must be adhered to (see chapter 3.3 on page 7). The conductors for the power supply must have an adequately low resistance to insure the correct supply voltage at the device.

NOTICE

A dust cap can be fitted to the cable entry of the device. This cap is only used for transport purposes and must be removed before the device is connected to a sealed conduit.

3.3 Impedance range of the signal loop

Devices with a HART interface can be operated with HART communication or in HART Multidrop mode.

Operating mode	Impedance range of signal loop as function of supply voltage
Operation without HART communication	Minimum 0 Ω in the range from 10 to 30 V DC
	Maximum 230 Ω at 10 V DC linear with supply voltage rising to maximum 500 Ω for ≥ 16 V DC
Operation with HART communication (HART mode)	Minimum 230 Ω in the range from 11 to 30 V DC
	Maximum 270 Ω at 11 V DC linear with supply voltage rising to maximum 500 Ω for ≥ 16 V DC
HART Multidrop operation	230 to 500 Ω 11 to 30 V DC

3.4 Mechanical installation

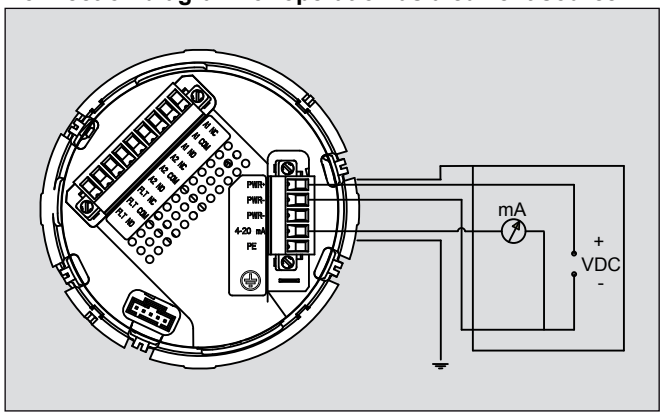
- Use the supplied drilling template for mounting on a wall.
- The mounting surface should be even and free of sharp edges.
- Dräger recommends using M6 Allen bolts.
- The openings must be readily accessible to the surrounding atmosphere.

3.5 Electrical installation without e-Box

CAUTION

First connect the cables for the relays and make the connections to the sensor before connecting the device to the power supply.

Connection diagram for operation as a current source



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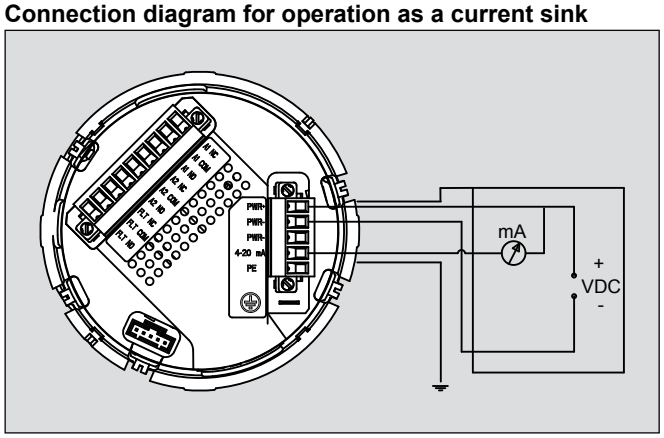
Connection diagram for operation as a current sink



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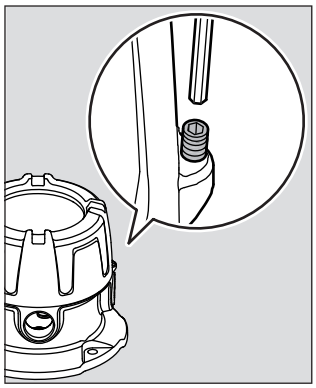
3.5.1 Power and signal cables



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1. Release the set screw and unscrew the housing cover from the device.
2. Lift the handle and remove the enclosure with the main electronics.
3. Connect the device electrically to the protective ground.
4. Turn over the main electronics and disconnect the 5-way plug.
5. Connect the three cables for the power supply and the signal to the corresponding terminals (see following table of connections for the 5-way plug).

Connections for 5-way plug (power supply and signal):

5-way plug (power supply and signal)					
Terminal	1	2	3	4	5
Ident.	PWR+	PWR-	PWR-	4 to 20 mA signal	PE
Function	V+	V-	V-	4 to 20 mA signal (Operation as source or sink)	PE

6. For operation without a central controller: connect Terminal 3 to Terminal 4.
7. Fit the plug back in the socket and tighten the screws.
8. The screen of the cable must only be connected to the control unit.
9. Insert the main electronics back in the housing.
10. Screw the cover on again and tighten the set screw.

3.5.2 Version with relays

WARNING

At voltages >30 V AC or >42.4 V DC, the relay cables must be enclosed in protective tubing, or double-insulated cables must be used.

When the relay module is fitted, the wires for the alarm device are connected to the 9-way plug.

1. Disconnect the 9-way plug on the rear of the main electronics.
2. Connect the wires for Alarm Relay 1, Alarm Relay 2 and the Fault relay to the corresponding terminals, (see following table of connections for the 9-way plug).
3. The relays are energized when the default settings are used and in the measurement mode. This insures "fail-safe" operation. The terminal assignments in the connection table below apply when the default settings are used and when in measuring mode (see chapter 4.6 on page 14).
4. Fit the plug back in the socket and tighten the screws.
5. Fit the enclosed protective cover over the plug and secure it with cable ties if necessary.

NOTICE

For clear and far-ranging detection of a device fault, an alarm device should be switched through the fault relay.

Connections for 9-way plug (relays):

9-way plug (relays)									
	Fault relay			A2 relay			A1 relay		
Terminal	1	2	3	4	5	6	7	8	9
Ident.	FLT NO	FLT C	FLT NC	A2 NO	A2 C	A2 NC	A1 NO	A1 C	A1 NC

(NO = Normally open, NC = Normally closed, C = Common)

3.6 Electrical installation with e-Box

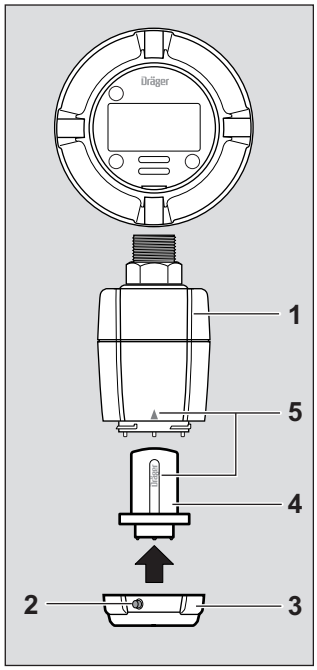
- Install the e-Box in accordance with the Installation Instructions for the Polytron 5000/8000 e-Box (order no. 90 33 242).

NOTICE

The e-Box can be pre-installed, wired and closed off with the supplied cover. As soon as the installation is ready for commissioning, the device is connected to the e-Box and put into operation. This prevents the device from being damaged during the construction phase.

3.7 Installing sensor

1. Unscrew bayonet ring (3) and remove blank.
2. Remove sensor from packaging.
3. Insert sensor or MEC sensor adapter (4) into the opening. The Dräger label on the sensor must point to the mark on the sensing head housing (5).
4. Lock sensor with bayonet ring.
5. Screw in the set screw (2; 2 mm Allen screw) of the sensor bayonet ring until the bayonet ring is locked to prevent accidental loosening.



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NOTICE

The EC sensing head is automatically recognized by the transmitter.

3.8 Installation of EC sensing head remote

3.8.1 Wall-pipe mounting set

CAUTION

Note the full range of environmental influences to which the sensing head may be exposed. Avoid external influences such as splashwater, oil, corrosive aerosols (salt spray) etc. and the possibility of mechanical damage.

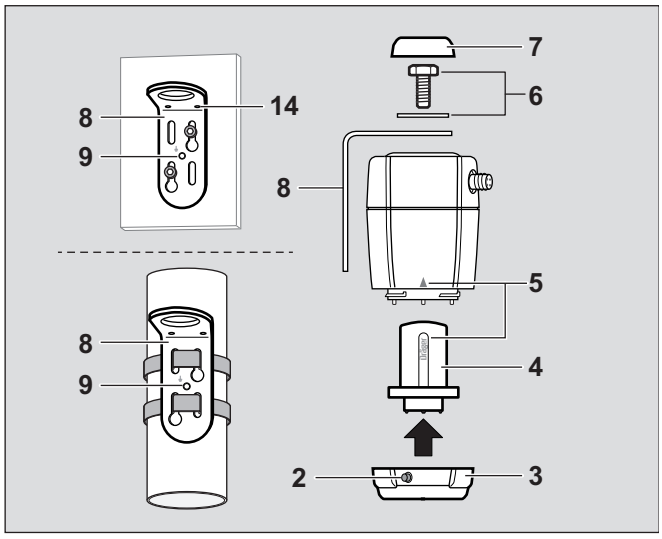
The gas inlet area of the sensor must be protected from water, dust and mechanical damage and kept clear of dirt. Do not allow paint to block the gas inlet if painting is conducted in the area.

Multiple EC sensing heads remote must not be connected in series.

NOTICE

The EC measuring sensor wall and pipe mounting accessory set (order no. 45 44 213) is required to mount the EC measuring sensor on a wall or pipe.

The sensing head should be mounted at a low-vibration location at even a temperature near a potential leakage point (avoid direct sunlight).



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1. Install wall-pipe mount (8) as specified by the assembly instructions.
2. Screw the EC sensing head to the wall mount with the included screw and washer (6).

NOTICE

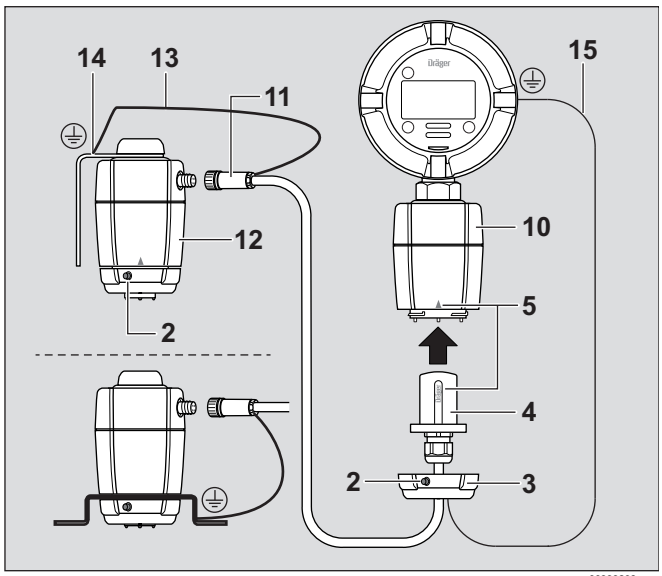
Observe the direction of the remote connector!

3. Select the appropriate protection cap (7) and place on the screw.

3.8.2 Installing sensor

1. Unscrew bayonet ring (3) from EC sensing head and remove blank.
2. Remove sensor from packaging.
3. Insert sensor or MEC sensor adapter (4) into the opening. The Dräger label on the sensor must point to the mark on the sensing head housing (5).
4. Lock sensor with bayonet ring.
5. Screw in the set screw (2; 2 mm Allen screw) of the sensor bayonet ring until the bayonet ring is locked to prevent accidental loosening.

3.9 Connecting to the Polytron 8000



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1. Attach remote cable plug (11, order no. see chapter 13 on page 34) to the EC sensing head remote (12) and lock by rotating the ring clockwise.
2. Screw the cable terminal of the shield (13) to the hole (M5 thread) on the wall mount (14) for the ground.
3. Unscrew bayonet ring (3) from EC sensing head local and remove blank. The black bayonet ring can be replaced with the silver bayonet ring for an improved appearance.
4. Insert the remote adapter (4) in the opening of the EC sensing head local. The Dräger label on the sensor adapter must point to the mark on the sensing head housing (5).
5. Lock sensor adapter with bayonet ring.
6. Fasten the cable terminal of the remote cable to the device housing for a ground (15).
7. Screw in the set screw (2; 2 mm Allen screw) of the sensor bayonet ring until the bayonet ring is locked to prevent accidental loosening.

NOTICE

The EC sensing head is automatically recognized by the transmitter.

3.10 Connecting the device to a Dräger control unit

NOTICE

Information on connection can be found in the Instructions for Use accompanying the particular Dräger control unit (e.g. Regard, QuadGard).

Electrical connections to the control unit

- Connect the screen for the wires to the grounding point in the control unit (e.g., chassis, grounding rail).

3.11 Connecting the device to a PC

The separately available Polytron 5000/8000 IR connection kit is intended for use with the Polytron 5000/8000 and enables communication between the Polytron 5000/8000 and a PC.

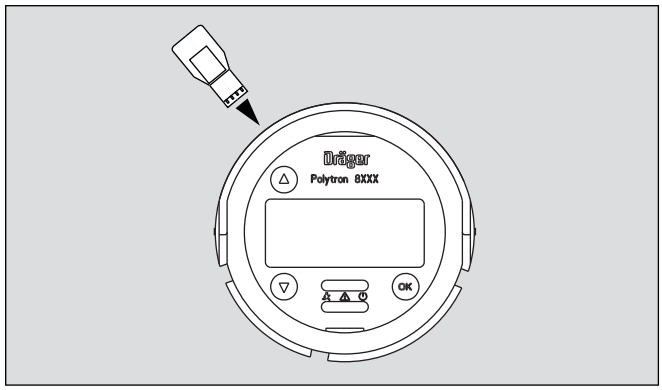
3.12 PolySoft 8000 PC software (optional)

The PolySoft 8000 PC software is used to display device information, edit configuration settings and read out from the measurements memory.

3.13 Installing software dongles

The following SW dongles are available for the Polytron 8000:

Sensor test dongle 83 17 619	Activates the sensor test (for certain sensors only)
Diagnostic dongle 83 17 860	Enables the sensor self test, the display of the remaining sensor activity and the sensor diagnostic function (for certain functions only)



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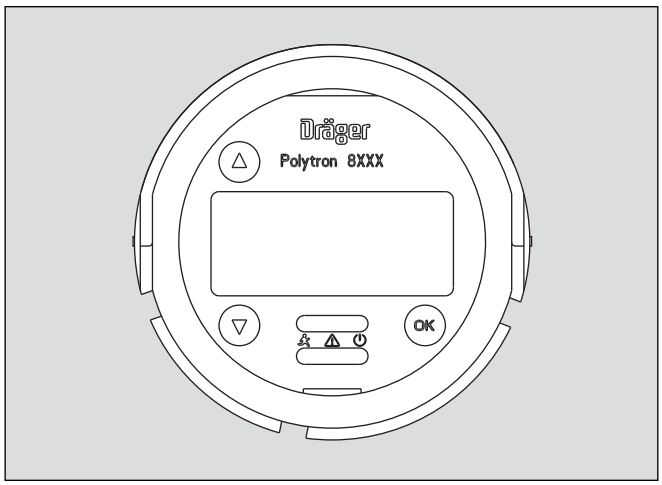
To install a SW dongle:

1. Switch off the power to the unit or declassify the area according to the local regulations.
2. Release the set screw and unscrew the housing cover from the device.
3. Lift the handle and remove the enclosure with the main electronics.
4. Insert the dongle in the slot with the Dräger lettering facing upwards.
5. Insert the main electronics back in the housing.
6. Screw the cover on again and tighten the set screw.
   The dongle is installed.
7. Switch on the power.

4 Operation

4.1 Operating fundamentals

4.1.1 Menu navigation



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It is possible to scroll through he menu items by tapping the ▲ and ▼ symbols with the magnetic wand (Part Number 4544101, blue). OK confirms a function.

NOTICE

The housing cover should be fitted when using the magnetic wand. If the housing cover is not fitted, the magnetic wand might activate two or more buttons at the same time (crosstalk).

Graphic symbols facilitate navigation in the various menus.

- With the text " back ", " Menu " etc. close menu or 1 step back.
- Closed folder
  Further functions or sub-menus are located under this item.
- Opened folder
  The functions and sub-menus available here are listed under this item.
- Function
  When activated, functions can be executed in one or more steps.
- Selection activated
  For functions that can be selected and activated, the activation is initiated by touching " OK ".
- List closed above / complete
  There are no further functions, menus or sub-menus listed above.
- List can be scrolled upwards
  There are further functions, menus or sub-menus listed above.
- List closed below / complete
  There are no further functions, menus or sub-menus listed below.
- List can be scrolled downwards
  There are further functions, menus or sub-menus listed below.
- Next
  Perform context-related action.
- 3/3 Number / total number of steps (screens) within the function.
- 2/2 Entry
  Enter data with " ▲ " and " ▼ ".

4.1.2 Changing parameter values or the parameter status

1. Select the desired menu item with ▲ and ▼.
2. Confirm the menu item with OK.
   The current value or status will be displayed.
3. Using ▲ and ▼, the value of a numerical parameter can be changed or preset values can be selected.
4. As soon as the desired value or the selection is displayed, tap OK to validate/confirm the new parameter.
5. Tap OK to access the next higher level.

- If exiting using **Back to menu** or **Previous**, all changes will be discarded.

4.1.3 Exiting menus

- ▲ Tap **Back to measurement** and OK to exit the menu.

4.2 Display and LEDs

In measurement mode, the current gas concentration, the name of the gas and the measurement units are shown on the display. The green LED is lit.

In addition, the following symbols may be displayed:

- " ⇈↑↑↑ ", if the measurement range is exceeded.
- " **- - - -** " and " **X** " in the event of a malfunction. The yellow LED is lit, (see chapter 4.2.2 on page 13).
- "SIL", when SIL status is activated.

When the optional relay PCB is used:

- If the first alarm has been triggered, the red LED flashes single and A1 is displayed.
- If the second alarm has been triggered, the red LED flashes double and A2 is displayed.

4.2.1 Special symbols

The following special symbols, which indicate the device state, may be displayed on the right hand side in measurement mode.

- Warning message present –
  To display warnings, see chapter 7.1.1 on page 18.
  Information can be retrieved in Info mode, see chapter 4.3 on page 13.
- Fault message present –
  To display the fault, see chapter 7.1.2 on page 18
- Maintenance signal will be generated on the interface, see chapter 8.3.2 on page 22.
- Measurement range of analog interface exceeded
- Measurement less than range of analog interface
- Analog interface is set to a fixed value (e.g. Multidrop HART communication) and is not transmitting any measurements.
- "Preventive" maintenance: The sensor is ready for operation
- "Preventive" maintenance: The sensor is ready for operation but is close to the end of its life cycle.
- "Preventive" maintenance: The sensor is still ready for operation but should be changed as soon as possible.
- The datalogger is active in rolling mode.
  To activate/deactivate, see chapter 8.5.2 on page 26.
- The datalogger is active in stacking mode.
  To activate/deactivate, see chapter 8.5.2 on page 26.

SIL SIL is activated (observe Safety Manual - Order Number 9033307).

4.2.2 LED symbols

Symbol	LED	Description
	red	Alarm triggered
	yellow	Malfunction / Warning
	green	Switched on Measurement mode

NOTICE

The alarm triggering function is only available when the optionally integrated relay module is used.

When the optional relay PCB is used:

- If the first alarm has been triggered, the red LED will single flash. A1 relay is activated.
- If the second alarm has been triggered, the red LED will double flash. A2 relay is activated.
- If an alarm can be acknowledged and is acknowledged, the LED stops flashing and is lit continuously instead until the alarm condition is no longer present. The corresponding relay is deactivated.

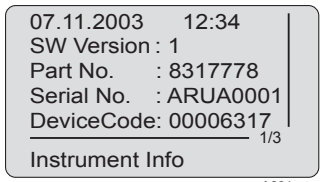
4.3 Activating the Info mode

The Info mode is used to present information about the central device settings and states.

- Tap ▲ and hold for 3 seconds.
  The device information appears on several sreens. No changes can be made.
- Tap ▲ or ▼ briefly to switch between the screens.
- The Info mode can be ended at any time by selecting OK.
- If no button is selected within 30 seconds, the device reverts automatically to the measurement mode.

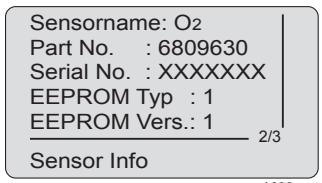
Example of the Info mode
(Screens vary depending on sensor):

1. Screen - Device information:



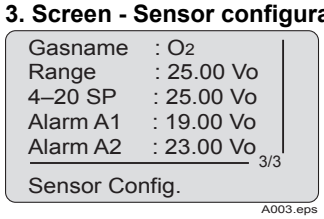
- Date and Time
- Software version
- Part number of the device
- Serial number of the device
- Device code

2. Screen - Sensor information:



- Sensor description
- Part number of sensor
- Serial number of the sensor
- Software version
- Software revision

3. Screen - Sensor configuration:



- Gas description
- Maximum measurement range and measurement units for the sensor
- Measurement range and measurement units for the analog interface. Only displayed when the 4-20 mA interface is enabled.
- A1 Alarm limit and measurement units[1]
- A2 Alarm limit and measurement units[1]

1 Only displayed when relay is configured.

4.4 Switching to the Quick Menu mode

- Tap ⏷ and hold for 1 to 2 seconds.
  The Quick Menu will open. This menu is displayed without any password request. No changes can be made.
  The selected information about status and device settings can be retrieved (e.g. warning messages, error messages, installed modules and calibration data).

4.5 Switching to Menu mode (password protected)

1. Tap ⏷ and hold for longer than 3 seconds.
   The password request appears.
2. **Enter the password** and confirm.
   The screen for password entry appears.
3. Set the password and confirm the entry.
   The menu hierarchy corresponding to the entered password will open.

- An error message appears if the entered password is invalid.

Password presets:
Password for the **Calibration** menu: _ _ _ 1
Password for the **Settings** menu: _ _ _ 2

4.6 Measurement mode

WARNING

The configuration and calibration settings must be checked before the device is operated in measurement mode.

- Switch on the power.
  - The device runs through a start-up sequence (LCD test by inverting the display, LED test, software version and initialization) and starts the warm-up phase. The display indicates that the sensor will be ready to operate in hh:mm:ss (the countdown begins) and the Polytron 8000 sends the Maintenance signal.
  - After the warm-up phase, the device enters into the measurement mode.
  - The current gas concentration, the selected gas and the units of measure appear on the display.
  - The ⏻ LED is lit green.
  - The sensor is ready to measure.

NOTICE

The correct date and time settings are important for many functions (see chapter 8.2.3 on page 20).

4.6.1 Analog signals

In measurement mode the output current of the device is between 4 and 20 mA and is proportional to the target gas concentration.

The device uses various current values to indicate different operating modes. This conforms to the NAMUR NE43 recommendation. The 4 to 20 mA interface on the device can be customized and configured to individual requirements. The device is provided with suitable standard settings factory default (see chapter 12.3 on page 32).

5 Calibration

Repeat the calibration of the device at regular intervals as specified in the respective sensor data sheet.

CAUTION

Danger to health! Do not inhale the test gas. Observe the hazard information in the corresponding safety data sheets. Provide venting into a fume hood or outside the building.

Always calibrate the zero point first before the sensitivity. Otherwise the calibration will be faulty!

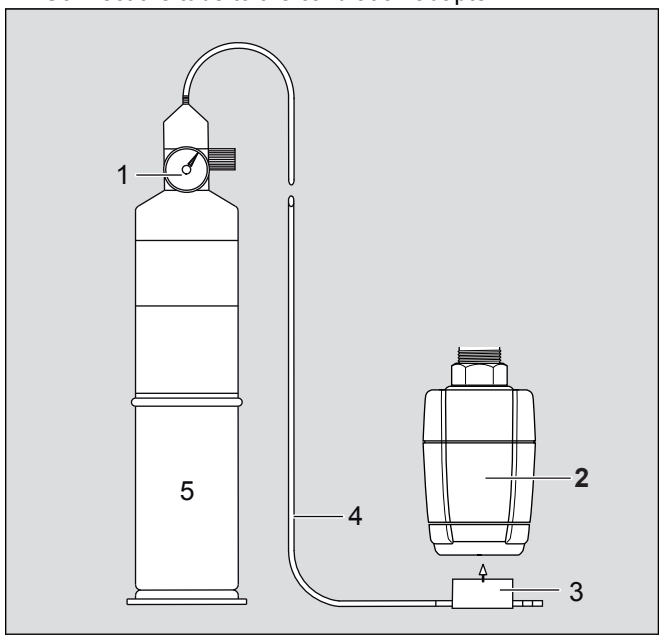
NOTICE

Calibration is not possible if the date and time are not set (see chapter 8.2.3 on page 20).

Dräger recommends calibrating devices with target gas. This method of target gas calibration is more accurate than a surrogate gas calibration. A surrogate gas calibration may only be performed as an alternative if a target gas calibration is not possible.

5.1 Calibrating the device

1. Connect the pressure regulator to the test gas cylinder.
2. Attach the calibration adapter to the sensor.
3. The gas flow should be approx. 0.5 L/min.
4. Connect the tube to the calibration adapter.



1 Pressure regulator
2 EC sensing head
3 Calibration adapter
4 Tube
5 Test gas cylinder

5.1.1 Zero point calibration

NOTICE

Ambient air can also be used instead of nitrogen or synthetic air to zero the sensor, provided it is insured that the ambient air contains no target gas or any other gas for which the sensor may be cross-sensitive to (see the details in the sensor data sheet). In this case, neither a test gas cylinder nor a calibration adapter is required for the zero point calibration.

The zero point cannot be calibrated for the O_2 sensor and exclusively Nitrogen must be used for testing.

1. Select **Calibration > Zero Calibration** and confirm.
   The Maintenance signal is transmitted.
   The message **Apply zero gas** appears.
2. Apply zero gas (synthetic air or nitrogen) to the sensor.
3. Select **Next** and confirm.
   The current measured value is displayed.

After the displayed value is stable:

4. Confirm with **OK**.
   The message **Please wait…** appears.
   The actual value is displayed.

- Actual value within the permissible range:
  - Select **Next** and confirm.
  - Shut off the test gas and remove the calibration adapter from the sensor or disconnect the hose.

5.1.2 Span calibration

1. Select **Calibration > Span calibration** and confirm.
   The parameters of the selected test gas are displayed.
   Example EC H_2S sensor

Cal. gas:	H_2S
Unit:	ppm
Conc.:	000025

   The unit and the test gas concentration can be changed. The test gas can also be changed for some sensors (e.g. DrägerSensor OV).
   To change the test gas:
   a. Select **Cal.Gas** and confirm.
   b. Select the required test gas and confirm.
   To change the unit:
   a. Select **Unit** and confirm.
   b. Select the required unit and confirm.
   To change the test gas concentration:
   a. Select **Conc.** and confirm.
   b. Select the desired test gas concentration and confirm.
2. Select **Next** and confirm.
3. Apply test gas (e.g. 50 ppm H_2S).
   The current value is displayed.

After the displayed value is stable:

4. Confirm the value.
5. Shut off the test gas and remove the calibration adapter from the sensor or disconnect the tube.

5.2 Performing Auto Calibration

The device offers the option of an automatically sequenced calibration. This reduces the number of otherwise manual interactions with the device. The auto calibration is only suitable for experienced users, as calibration errors can occur here as a result of tightened procedures.

NOTICE

Not all of the available sensors and gases support auto calibration. If the function is not available, a manual calibration must be performed.

1. Select **Settings > Sensor > Autocal. set.** to enable or disable the function.
2. Supply fresh air or apply nitrogen or compressed air to the sensor at a flow rate of 0.5 L/min.

WARNING

It must be insured that during the zero point calibration, no target gas is present in the supplied test gas. Particularly with a fresh air calibration, Dräger recommends performing a second, independent measurement. Some sensors may only be calibrated with synthetic air or nitrogen (see respective sensor data sheets).

3. Select **Calibration > Auto cal.** and confirm.
   - **Please wait...** is displayed and a calibration of the zero point is performed automatically.
   - After a successful zero point calibration, the span calibration is started.
   - The test gas concentration, the units and, where appropriate, the calibration gas are displayed and can be changed.
4. Start the calibration with **Next**; **Back to menu** aborts the calibration.

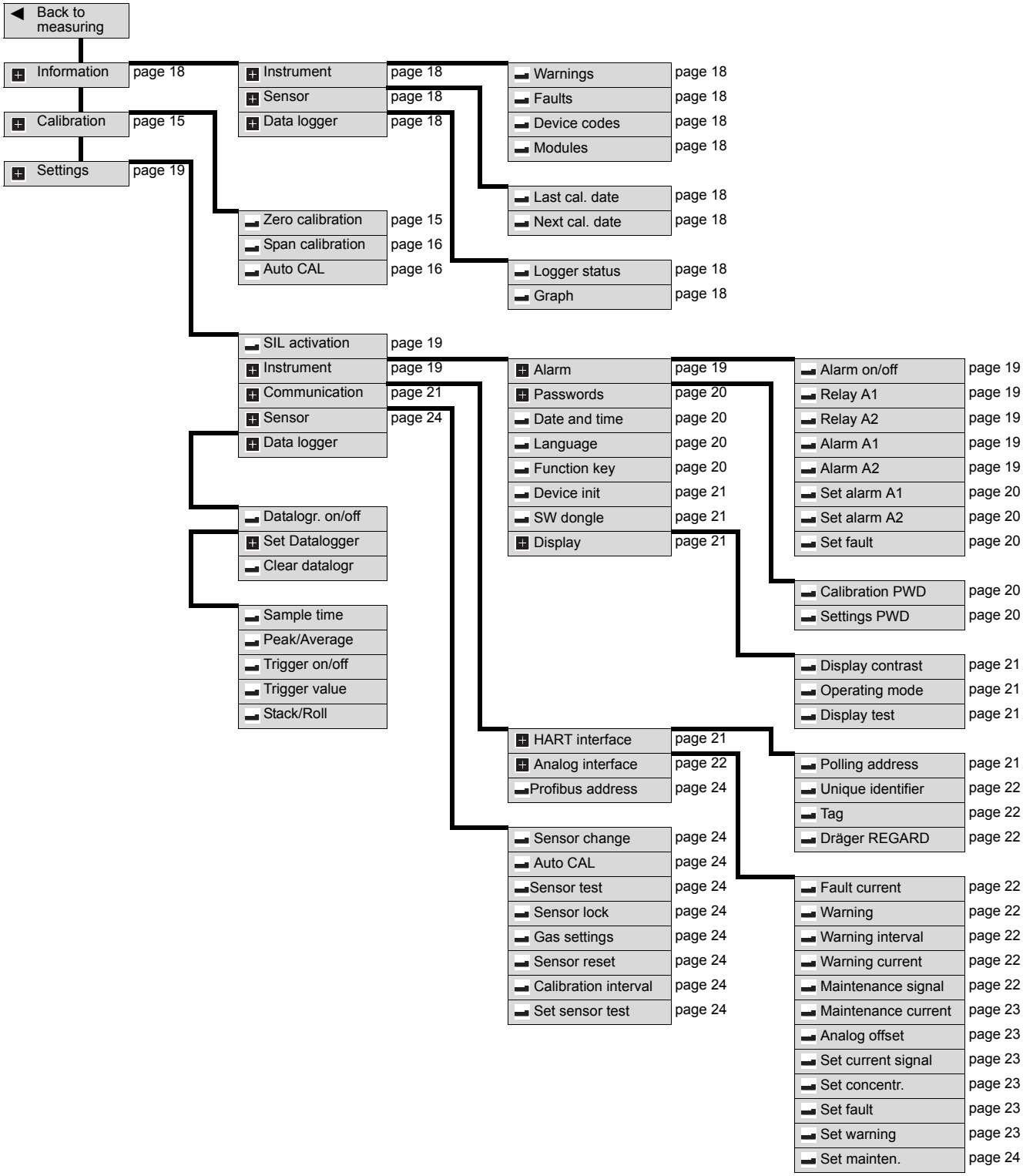
NOTICE

After 10 minutes, without confirmation the device reverts to measurement mode without performing a calibration.

5. Apply the test gas to the sensor at a flow rate of 0.5 L/min.
   - When the measured value is stable, the device performs the calibration automatically.
   - After a successful calibration, the measurement and the message **Value OK?** are displayed
6. When the value is stable, shut off the test gas and wait until the measurement is below any possible alarm thresholds again.

- The calibration is performed again with **Redo**.
- Complete the calibration with **Accept value**
  The device returns to the measurement mode.

6 Menu overview



7 Information menu

Specific data about the device, the sensor used and the target gas are summarized in this menu. The menu can be accessed without a password. Changes to the data are not possible.

7.1 Device settings

7.1.1 Displaying warning messages

To display warnings in plain text with warning numbers, see chapter 9 on page 27.
The ! symbol is displayed when there is a warning present.

- Select **Information > Instrument > Warnings** and confirm.
  Warnings are displayed in plain text.
  If several warnings are present, this is indicated in the upper right-hand corner of the display, e.g., 1/3 = Screen 1 of 3.

7.1.2 Displaying fault messages

To display faults present in plain text with fault numbers, see chapter 9 on page 27.
The ⊠ symbol is displayed when there is a fault present.

- Select **Information > Instrument > Faults** and confirm.
  Faults are displayed in plain text.
  If several faults are present, this is indicated in the upper right-hand corner of the display, e.g., 1/2 = Screen 1 of 2.

7.1.3 Displaying device codes

Display of codes for faults/warnings in a numerical table (hexadecimal).
The ⊠ symbol is displayed when there is a fault present.

- Select **Information > Instrument > Device codes** and confirm.
  Faults are displayed as a hexadecimal numerical code in tabular form. If all the numerical groups are displayed as **00**, there are no faults or warnings present.

NOTICE

The fault code is very helpful for technical support and should always be stated in full in the event of a fault.

7.1.4 Displaying installed modules

Display of the installed hardware modules.

- Select **Information > Instrument > Modules** and confirm.
  A list of all possible modules is displayed. The installed modules are identified by a ■, those not installed by a □.
- Mark a module and request detailed information with OK.

7.2 Sensor information

This menu contains the functions for retrieving the calibration data.

7.2.1 Display last calibration date

Display the date of the last calibration.

- Select **Information > Sensor > Last cal. date** and confirm.
  The date of the last calibration is displayed.

7.2.2 Display next calibration date

Display the date of the next calibration.

- Select **Information > Sensor > Next cal. date** and confirm.
  The date when the next calibration of the sensor is due is displayed.

7.3 Datalogger information

This menu contains the functions for querying the datalogger.

7.3.1 Displaying the datalogger status

- Select **Information > Datalogger > Logger status** and confirm.
  The current status of the datalogger is displayed: Datalogr.: on or off (datalogger on or off).
- To switch the datalogger on/off, see chapter 8.5.1 on page 26.

7.3.2 Displaying a graph of measured values

Show the measurements from the sensor on a 15-minute time axis.

- Select **Information > Datalogger > Graph** and confirm.

8 Settings menu

This menu contains all the functions that are required for the individual configuration of the device.

8.1 Switching SIL lock on or off

NOTICE

If the SIL lock is to be switched on, the sensor test must be activated (see chapter 8.4.3 on page 24).

SIL lock is only available for certain sensors (see also the sensor data sheets or the Dräger Polytron 8X00 Safety Manual).

With this function, the device can be protected against unauthorized changes to the configuration with a password. Changing the configuration (e.g., changing the measurement range from 100 ppm to 50 ppm) will cause the device to display all the safety-relevant parameters to the user once more before it returns to the measurement mode. The correctness of the parameters and settings must be confirmed.

1. Select **Settings > Instrument > Set SIL**.
2. Select the desired state **On** or **Off** and confirm.

NOTICE

When SIL is activated, the device displays all the important parameters and setting before returning to measurement mode. Check the parameters and settings carefully and confirm.

8.2 Device settings

8.2.1 Alarm settings (only with installed relay module)

Alarms issued via relays and LEDs.

CAUTION

In the normal state, the relays in the relay module are energized. That is, the relays change their state if the power supply is interrupted!

Switching the alarm on or off

1. Select **Settings > Instrument > Alarm > Alarm on/off**.
2. Select the desired state **On** or **Off** and confirm.

CAUTION

If the alarm is inactive, the alarm state will not be issued by the LEDs or the relay interface! A warning message will be shown on the display!

Configuring Relay A1 or A2

This function is used to define whether the alarm relay is energized in standard operation or in an alarm state. If the configuration of the relay is set to "Normally energized", the corresponding relay contact is closed in the normal case and drops out in the event of an alarm. This configuration results in an alarm being triggered in the event of a loss of power to the transmitter (fail-safe). The fault relay is factory-configured to "Normally energized" and cannot be changed.

1. Select **Settings > Instrument > Alarm > Relay A1** or **Relay A2** and confirm.
2. Select **Normal energy supply** or **Energy supply during alarm** and confirm.

Configuring Alarm A1 or A2

1. Select **Settings > Instrument > Alarm > Alarm A1** or **Alarm A2** and confirm.
2. Select the line for entering the alarm limit and confirm.
3. Set the threshold and confirm.
   The setting for the alarm threshold is displayed.
4. Select **Next** and confirm.
   The setting for the alarm direction is displayed.
5. Select **Rising** or **Falling** and confirm.
6. Select **Next** and confirm.
   The setting for the alarm direction is displayed.
7. Select **Latching** or **Non-latching** and confirm.
8. Select **Next** and confirm.
   The setting for the acknowledgement is displayed.
9. Select **Acknowledgeable** or **Not acknowledgeable** or **PreAcknowledgeable** and confirm.
10. Select **Next** and confirm.
    The function for setting the A1 hysteresis is opened.

NOTICE

This function permits the setting of a zone within which a triggered relay maintains its status until the gas concentration is outside the zone. This function prevents relays from chattering at an alarm threshold.
Example: A2 at 20 ppm H_2S
Hysteresis: 3 ppm
Alarm activation at measured values ≥20 ppm
Alarm deactivation at measured values ≤17 ppm
(20 ppm - 3 ppm)

11. Select the line for entering the hysteresis and confirm.
12. Set the hysteresis for A1 and confirm.
    The hysteresis setting for A1 is displayed.
13. Select **Next** and confirm.
    The settings for A1 are displayed.
14. Select and confirm with **Confirm**.
    The settings for the A1 alarm are now complete.

The functional relationship between the various settings is explained in the following table:

Latching and acknowledgeable	The alarm must be acknowledged manually. The alarm can be acknowledged when the alarm condition is still present.
Latching and not acknowledgeable	The alarm must be acknowledged manually. The alarm can only be acknowledged when the alarm condition is no longer present.
Latching and pre-acknowledgeable	The alarm must be acknowledged manually. The alarm can be acknowledged when the alarm condition is still present but will only be reset when the alarm condition is no longer present.
Non-latching and acknowledgeable	The alarm is acknowledged automatically when there is no longer any alarm condition present, or it can be acknowledged manually.
Non-latching and not acknowledgeable	The alarm is acknowledged automatically when there is no longer any alarm condition present. The alarm cannot be acknowledged manually.
Non-latching and pre-acknowledgeable	Corresponds to the alarm behavior for "Non-latching" and "Not acknowledgeable".

Testing Alarm A1

NOTICE

When the function **Set Alarm A1** is exited in the menu, the Polytron 8000 reverts automatically to measurement mode.

This function simulates the A1 alarm status.

1. Select **Settings > Instrument > Alarm > Set Alarm A1** and confirm.
2. Select **On** or **Off** and confirm.

When the function is activated, the relay and the interface are set to the A1 alarm status and the red LED will single flash.

Testing Alarm A2

NOTICE

When the function **Set Alarm A2** is exited in the menu, the Polytron 8000 reverts automatically to measurement mode.

This function simulates the A2 alarm status.

1. Select **Settings > Instrument > Alarm > Set Alarm A2** and confirm.
2. Select **On** or **Off** and confirm.

When the function is activated, the relay and the interface are set to the A2 alarm status and the red LED will double flash.

Testing Fault status

NOTICE

When the function **Set fault** is exited in the menu, the Polytron 8000 reverts automatically to measurement mode.

This function simulates the Fault alarm.

1. Select **Settings > Instrument > Alarm > Set fault** and confirm.
2. Select **On** or **Off** and confirm.

When the function is activated, the Fault relay and the 4-20 mA interface are set to the fault current and the yellow LED lights.

8.2.2 Changing passwords

The passwords for calibration (zero and span calibrations) and for the settings (full configuration) can be defined in this menu.

1. Select **Settings > Instrument > Passwords > Calibration/ Settings PWD** and confirm.
2. Select the line for the password settings and confirm.
3. Set the password and confirm.
   The setting for the password is displayed.
4. Select **Confirm** and confirm.

8.2.3 Setting the date and time

1. Select **Settings > Instrument > Date and time** and confirm.
2. Select the desired line and confirm in order to switch to the Change mode.
3. If necessary, set day, month and year and confirm every setting.
4. Select **Confirm** and confirm.

8.2.4 Changing the display language

1. Select **Settings > Instrument > Language** and confirm.
2. Select the desired language from the list and confirm.

8.2.5 Configuring the function key

This function is used to assign a predefined function to the ▲ key. The selected function is activated by briefly touching the ▲ key.

1. Select **Settings> Instrument > Function key** and confirm.
2. Select the desired function and confirm.

- Repeating the confirmation deactivates the selected function.
- If **Bumptest** is selected:
  The maintenance symbol is shown on the right hand side of the display and the maintenance signal is generated. Repeating the confirmation ends the bump test and the device reverts to the normal measurement mode.
- In measurement mode, the selected function can be activated by briefly taping ▲.

Selection options:

Graph (only with datalogger)	The measurements from the sensor are displayed graphically on a time axis (see chapter 7.3.2 on page 18).
Faults	Faults are displayed in plain text (see chapter 7.1.2 on page 18).
Warnings	Warnings are displayed in plain text (see chapter 7.1.1 on page 18).
Bump test	The bump test allows gas to be applied without an alarm being issued. The maintenance signal is generated on the 4-20 mA output.
Sensor vitality (only with diagnostic dongle)	Shows the remaining sensor vitality (only available for certain sensors).

8.2.6 Resetting the device to factory settings

The following device parameters are reset to the factory settings with this function (see chapter 12.3 on page 32).

- Alarm parameters
- Passwords
- Language
- Function key
- HART interface
- Data logger
- Analog interface
- Relay configuration

1. Select **Settings > Instrument > Device init.** and confirm.
2. Select **Confirm** and confirm in order to reset the device to the factory settings.

8.2.7 Deactivating the software dongle

This function allows the SW dongles to be deactivated before they are removed or in the event of a fault.
A dongle can only be reactivated by switching the power to the device off and on.

1. Select **Settings > Instrument > SW dongle > Dongle datalogger/Dongle sensortest/Dongle diagnostic** and confirm.
2. Select **Deactivate function** and deactivate Dongle datalogger/Dongle sensortest/Dongle diagnostic with OK.

8.2.8 Display settings

Changing the contrast

1. Select **Settings > Instrument > Display > Display contrast** and confirm.
2. Change the contrast and confirm.

Changing the display mode
The display of measured values can be turned on or off with this function.

1. Select **Settings > Instrument > Display > Display mode** and confirm.
2. Select **Standard** or **Non display** and confirm.

If "Non display" has been selected, the display shows the start screen and the symbols.

If the relay option is set and an alarm is triggered, the display shows the current gas concentration and the red LED flashes, regardless of the selected display mode.

Switching the display test on or off
The function of the display and the LEDs is tested with this function.

1. Select **Settings > Instrument > Display > Displaytest** and confirm.
2. Select **On** or **Off** and confirm.

When this function is activated, the display is shown inverted and all the LEDs are lit.

8.3 Communication settings

8.3.1 Settings for the HART interface (only for devices with the optional HART interface)

This group contains the setting functions for the HART interface.

Setting the polling address
The polling address configures the device for analog operation (4 to 20 mA) or multidrop operation. Analog operation (4 to 20 mA) is activated by setting the polling address to 0. For multidrop operation the polling address must be configured to a value between 1 and 15, which will result in the analog interface being deactivated and set to a constant current of approx. 1 mA. To allow the control unit to request the Unique Identifier (unique HART address) with HART command #0, all the devices on a line must be configured with different polling addresses. It is advisable to choose a sequence starting with 1 and incrementing continuously.
This setting corresponds to HART command #6 (Write Polling Address).

1. Select **Settings > Communication > HART interface > Polling address** and confirm.
2. Select the address line for the entry and confirm in order to switch to the Change mode.
3. Set the polling address and confirm.
4. Select **Confirm** and confirm.

Displaying the Unique Identifier
This function enables reading of the Unique Identifier (unique HART address), which has to be known for almost all the HART addressing commands. However this information is only required for those systems that are not able to read back the Unique Identifier using HART command #0 in Short-Frame Format or HART command #11. The display corresponds to the address for HART command #0 (Read Unique Identifier) or #11 (Read Unique Identifier associated with Tag).

- Select **Settings > Communication > HART interface > Unique Identifier** and confirm.
  The Unique Identifier is displayed.

Changing the tag name
The tag can be used to identify special devices. It can contain up to 8 alphanumeric characters. The tag can also function as an address for reading the unique identifier from the device using HART command #11 (Read Unique Identifier Associated With Tag), even when the polling address is unknown.
This requires that a unique tag has previously been configured.

1. Select **Settings > Communication > HART interface > Tag** and confirm.
2. Select the tag line for the entry and confirm.
3. Set the tag and confirm.
4. Select **Confirm** and confirm.

Selecting Dräger REGARD
This function enables switching between different HART protocols.

NOTICE

REGARD SW 2.0 is the standard setting. REGARD SW 1.4 must be set on REGARD controllers with SW 1.4.

1. Select **Settings > Communication > HART interface > Dräger REGARD** and confirm.
2. Select **REGARD SW 2.0** or **REGARD SW 1.4** and confirm.

8.3.2 Settings for the analog interface

The test and setting functions for the analog interface are summarized in this menu.

Setting the fault current
This function is used to set the current for the fault signal on the analog interface.

1. Select **Settings > Communication > Analog interface > Fault current** and confirm.
2. Select the fault current line and confirm.
3. Set the current and confirm.
4. Select **Confirm** and confirm.

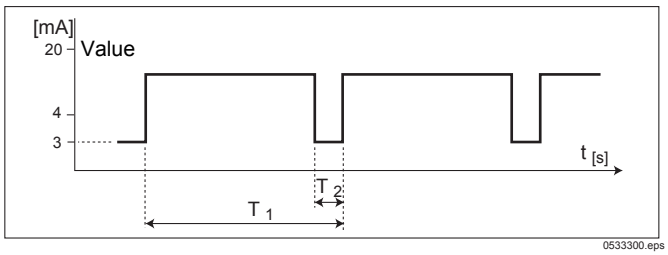
Switching the warning signal on or off
This function is used to switch the warning signal on the analog interface on and off. If an existing warning is to be output over the analog interface, the warning signal must be turned on. During a warning, the current on the analog interface is switched to the "Warning" status for one second. The measurement is transmitted for the rest of the time. The interval between warning signals and the analog signal phase can be customized.

To switch the warning signal on or off:

1. Select **Settings > Communication > Analog interface > Warning** and confirm.
2. Select **On** or **Off** and confirm.

Setting the warning interval
This function is used to set the interval between the warning signals and the measured value output.

1. Select **Settings > Communication > Analog interface > Warning interval** and confirm.
2. Select line **T1** for the entry and confirm.
3. Set the time and confirm.
   The setting for Time T1 is displayed.
4. Select **Next** and confirm.
5. Select line **T2** for the entry and confirm.
6. Set the time and confirm each setting.
   The setting for Time T2 is displayed.
7. Select **Confirm** and confirm.



Setting the warning current
This function is used to set the current for the warning signal on the analog interface.

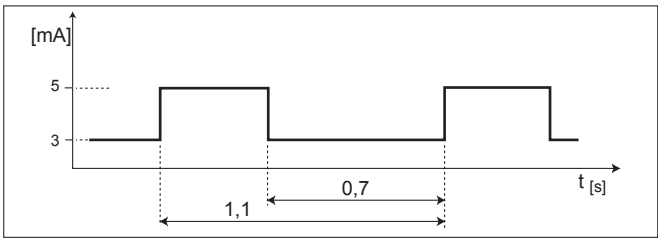
1. Select **Settings > Communication > Analog interface > Warning current** and confirm.
2. Select the current line for the entry and confirm.
3. Set the current and confirm.
   The setting for the warning current is displayed.
4. Select **Confirm** and confirm.

Changing the maintenance signal type
This function sets the type of signal used on the analog interface for the maintenance signal.

1. Select **Settings > Communication > Analog interface > Maint. signal** and confirm.
2. Select **static** or **dynamic** signal type and confirm.

NOTICE

The **static** signal type is a constant current. The current can be configured.
The **dynamic** signal type is a square wave signal with the following characteristics:



Setting the maintenance current
This function is used to set the current for the maintenance signal on the analog interface.

1. Select **Settings > Communication > Analog interface > Maint. current** and confirm.
2. Select the current line for the entry and confirm.
3. Set the current and confirm.
   The setting for the maintenance current is displayed.
4. Select **Confirm** and confirm.

NOTICE

The maintenance current can only be set if the maintenance signal has been set to static. This function is not available otherwise.

Setting the 4 to 20 mA offset
This function adds an adjustable offset current to the analog interface. The offset is constant over the entire range of the output signal.

1. Select **Settings > Communication > Analog interface > Analog offset** and confirm.
2. Select the current line for the entry (max. range: –0.2 to 1.5 mA) and confirm.
3. Set the current and confirm.
   The setting for the 4 to 20 mA offset is displayed.
4. Select **Confirm** and confirm.

Test functions for the analog interface

NOTICE

Alarms in the central controller may be triggered by these functions! If necessary, the alarms in the central controller must be disabled beforehand.

Setting current signals
Using this function, various currents in the range from 0 to 22 mA can be set on the analog interface.

1. Select **Settings > Communication > Analog interface > Set current signal** and confirm.
2. If the alarm in the control unit is disabled, confirm the message **suppress all alarm settings**.
3. Select the current line for the entry and confirm.
4. Set the current and confirm.
   The setting for the current is displayed.
5. Select **Next** and confirm.
6. Select **Set current out** or **Current off** and confirm.
7. Select **Next** and confirm. The function is terminated.
8. After the alarm settings in the control unit have been re-enabled, confirm the **Enable all alarm settings** message.

Setting the concentration
This function is used to set various concentrations in the range between 0 and 100 % of the selected unit of measure. The current output is set to correspond to the selected concentration.

1. Select **Settings > Communication > Analog interface > Set concentr.** and confirm.
2. If the alarm in the control unit is disabled, confirm the message **suppress all alarm settings**.
3. Select the concentration line for the entry and confirm.
4. Set the concentration and confirm.
   The setting for the concentration is displayed.
5. Select **Next** and confirm.
6. Select **Define concentration output** or **Conc. off** and activate.
7. Select **Next** and confirm. The function is terminated.
8. After the alarm settings in the control unit have been re-enabled, confirm the **Enable all alarm settings** message.

Testing the Fault signal
This function is used to set the analog interface to the error signal.

1. Select **Settings > Communication > Analog interface > Set fault** and confirm.
2. Select **On** or **Off** and confirm.
   The current for the Fault signal will be transmitted on the analog interface.

Testing the warning signal
This function is used to set the analog interface for the warning signal.

1. Select **Settings > Communication > Analog interface > Set warning** and confirm.
2. Select **On** or **Off** and confirm.
   The current for the warning signal will be transmitted on the analog interface.

Testing the maintenance signal
This function is used to set the analog interface for the maintenance signal.

1. Select **Settings > Communication > Analog interface > Set mainten.** and confirm.
2. Select **On** or **Off** and confirm.
   The current for the maintenance signal will be transmitted on the analog interface.

8.3.3 Profibus address

Not yet active - for future functions.

8.4 Sensor settings

8.4.1 Sensor change

A sensor can be changed during operation with this function without triggering a fault signal at the central controller. It also ensures that all sensor data in the microprocessor can be saved in sensor memory (EEPROM) before disconnecting the sensor.

A sensor can be changed at any time. However, for safety reasons a fault alarm is generated when the sensor is disconnected until a new sensor is connected.

1. Select **Settings > Sensor > Sensor change** and confirm.
   The maintenance signal is generated at the analog interface, the display shows: "Please remove the sensor".
2. Replace old sensor with a new sensor, see chapter 8.4.1 on page 24.

When the new sensor is installed:
Display: "Loading data, please wait".

When the sensor data are loaded:
Display: "Data loaded".

3. Select **Back to menu** and confirm.
   The maintenance signal at the analog interface remains pending until the sensor is warmed-up.

The warm-up time depends on the type of sensor and its history. For example, if the sensor was already warmed-up at another transmitter and operation only interrupted for a short time, the warm-up time can be shorter than the time specified in the Instructions for Use for the sensor.

Maximum warm-up time of a new sensor: see the Instructions for Use for the sensor.

If an identical sensor (with the same part number) was installed immediately before, the transmitter configuration is retained (gas type, measurement range, test gas, calibration interval). Otherwise the preset values of the sensor (see Instructions for Use for the sensor) are uploaded to the transmitter if the sensor lock function (see chapter 8.4.4 on page 24) is deactivated.

8.4.2 Switching Auto CAL on or off

NOTICE

The auto-calibration from the **Calibration** menu is only available if this function is enabled.

1. Select **Settings > Sensor > Set Auto CAL** and confirm.
2. Select **On** or **Off** and confirm.

8.4.3 Sensor test (only with sensor test dongle)

Switching automatic sensor test on or off

When the sensor test is enabled, the transmitter continuously checks the sensor to ensure reliable functioning. If the sensor does not pass the test, an appropriate warning or fault indication is issued.

1. Select **Settings> Sensor > Sensor test** and confirm.
2. Select **On** or **Off** and confirm.

Manually triggering the sensor test
The sensor test is started manually with this function:

1. Select **Settings > Sensor > Set sensor test >** and confirm.

If a sensor test can be triggered depending on the sensor or transmitter status:

2. Select **Start sensor test** and confirm.
   The result of the sensor test is displayed after a few seconds.

8.4.4 Sensor lock

If the sensor lock is to be switched on or off for the sensor:

1. Select **Settings > Sensor > Sensor lock** and confirm.
2. Select **Activate** or **Deactivate** and confirm.

Activate	=	The transmitter will only accept a new sensor if the Part Number (= Dräger Order Number), and hence the sensor type, is identical to that of the previous sensor.
Deactivate	=	The transmitter will also accept other sensor types and with thus upload the default settings for the sensor, i.e., in this case the configuration of the transmitter will be altered.

8.4.5 Changing the gas settings

Settings for gas type, measuring range and measurement units can be made in this menu.

1. Select **Settings > Sensor > Gas setting** and confirm.
2. Select the target gas from the list and confirm.
   The measurement units display will be shown.
3. Select the measurement units and confirm.
   The full scale reading display will be shown.
4. Set the full scale reading and confirm.
   The setting for the full scale reading is displayed.
5. Select **Next** and confirm.
   an overview of the new gas settings is displayed.

- Return to the previous view with **Previous** or confirm the settings with **Confirm**.

Information about measurement units
The Polytron 8000 represents the measured value in various optional units. The following are available:

- ppb
- ppm
- vol. %
- %LEL
- %LIE
- %UEG
- hPa
- kPa
- L/m^3
- mbar
- mg/L
- mg/m^3
- mL/L
- mL/m^3
- ubar
- ug/L
- ug/m^3
- uL/L
- uL/m^3
- Pa

The Polytron 8000 automatically calculates the correct value.

Information about the 20 mA measuring range
The maximum range can be set with this function. At the maximum range set, the device outputs 20 mA on the 4-20 mA interface.

8.4.6 Resetting the sensor to factory settings

This function resets all the sensor parameters to the factory default settings (see chapter 12.3 on page 32).

1. Select **Settings > Sensor > Sensor reset** and confirm.
2. Select **Confirm** and confirm.

8.4.7 Setting the calibration interval

NOTICE

The calibration interval can be set between 0 and 720 days.

1. Select **Settings > Sensor > Calibration interval** and confirm.
2. Set the calibration interval and confirm.

8.5 Datalogger

The datalogger has a storage capacity of approx. 3000 measurements. At a sampling interval of 1 minute, this would allow monitoring for approx. 50 hours. The monitoring time can be significantly increased if the **Trigger** function is enabled.

The results in the datalogger can only be evaluated with the PolySoft 8000 PC software. An evaluation of the datalogger contents over the last 15 minutes is available in the menu under **Information > Datalogger > Graph** (see chapter 7.3.2 on page 18).

8.5.1 Switching the datalogger on or off

1. Select **Settings > Datalogger > Datalogr. on/off** and confirm.
2. Select **On** or **Off** and confirm.

8.5.2 Setting up the datalogger

Setting the sampling interval

1. Select **Settings > Datalogger > Datalogr. on/off > Sample time** and confirm.
2. Select the sample time and confirm.

Setting peak/average

1. Select **Settings > Datalogger > Set datalogger > Peak/average** and confirm.
2. Select the desired function and confirm.

Peak value	The measured maximum value (for O_2, the minimum value) of the concentration within the selected sampling interval is stored.
Average	The average value of all the concentrations measured within the selected sampling time is stored.

Switching the trigger on or off

1. Select **Settings > Datalogger > Set datalogger > Trigger on/off** and confirm.
2. Select **On** or **Off** and confirm.

On	Concentrations will only be stored if they exceed (relative to the last stored value) a threshold set under Trigger Value.
Off	The measurements made within the set sampling time are always stored.

Setting the trigger threshold

The trigger threshold is specified as a percentage of the maximum range.
Example: A trigger threshold of 2 % is entered for a maximum range of 500 ppm. Consequently the datalogger will only store measurements if they deviate (relative to the last stored value) by 10 ppm.

1. Select **Settings > Datalogger > Datalogr. on/off > Trigger value** and confirm.
2. Set the trigger value and confirm.

Setting the storage mode

1. Select **Settings > Datalogger > Set Datalogger > Stack/Roll** and confirm.
2. Select the desired condition and confirm

Overwrite	When the capacity of the datalogger is used up, the older data will be overwritten.
Hold	When the capacity of the datalogger is used up, no more data can be stored. An appropriate warning is issued.

8.5.3 Clearing the datalogger

1. Select **Settings > Datalogger > Clear Datalogr.** and confirm.
2. To clear the datalogger, select **Confirm** and confirm.

9 Troubleshooting

9.1 Fault reference

Fault number	Cause	Remedy
#001 #003 #004 #005 #011 - #014 #020 - #024 #043 #060 #067	Serious device fault, various causes.	Have the device checked by DrägerService®[1].
#002 #025 - #027 #030 - #034 #041 #042 #044 #050 #052 #081 #085	Serious data error in the device, various causes.	Reset the device to factory settings (see chapter 8.2.6 on page 21). If this fault occurs again: Have the device checked by DrägerService.
#010	4-20 mA interface cable not connected.	Disconnect the power supply, connect the 4-20 mA interface and reconnect the power supply. For operation without controller, connect terminal 3 with terminal 4 (see chapter 3.5.1 on page 8).
#045	Device not detecting any sensor.	Check contacts. If this fault occurs again: Have the device checked by DrägerService.
#051 #054	Faulty zero-point.	Perform zero-point calibration (see chapter 5.1.1 on page 15).
#055	Faulty span calibration was performed.	Perform new span calibration (see chapter 5.1.2 on page 16).
#076 #080 - #084	Device fault.	Check contacts. If this fault occurs again: Have the device checked by DrägerService.
#105	Device fault.	Have the device checked by DrägerService.
#137	Device fault.	Restart. If this fault occurs again: Have device checked by DrägerService.

1 DrägerService® is a registered trademark of Dräger.

9.2 Warning reference

Warning number	Cause	Remedy
#101	Datalogger in Stack mode is 100 % full and is not logging any more data.	Read out the data, clear the datalogger and start again.
#102	Datalogger in Stack mode is 90 % full.	Read out the data as soon as possible, clear the datalogger and start again.
#103 #106	Data error in the device. Functions such as the datalogger or dongle functions may no longer be available.	Reset the device to factory settings (see chapter 8.2.6 on page 21). If this fault occurs again: Have the device checked by DrägerService.
#104	No valid date or time set.	Set time and date (see chapter 8.2.3 on page 20).
#107	Battery almost used up.	Have the device checked by DrägerService.
#110 #111 #112	SW dongle has been removed without logging out.	Disable SW dongle (see chapter 8.2.7 on page 21).
#113	Alarms disabled.	Enable alarms (see chapter 8.2.1 on page 19).
#164 #165	Sensor warm-up phase has not ended yet. Increased measurement error must be expected.	Wait until the sensor has warmed up.
#167 #170	Calibration interval expired.	Recalibrate the device (see chapter 5.1 on page 15).

10 Maintenance

10.1 Maintenance intervals

10.1.1 During commissioning

- Check calibration.
- Check signal transmission to controller and triggering of alarms.

10.1.2 Every 6 months

- Inspection by trained service personnel.

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.
Contact DrägerService if you wish to take out a service contract and have any repairs carried out.

10.1.3 As required

- Change the sensor, see chapter 10.2 on page 29.

10.2 Changing the sensor

WARNING

As a matter of principle, always check a newly installed sensor with target gas to insure correct operation.

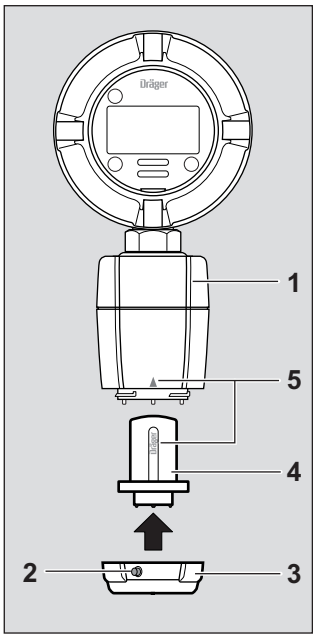
CAUTION

When the sensor is changed, all settings and parameters must be checked for correctness.

The sensor can be replaced in the hazardous, classified area, without interrupting the power supply.

The sensor is changed as follows:

1. Select **Settings > Sensor > Sensor change** and confirm (see chapter 8.4.1 on page 24).
2. Unscrew bayonet ring (3) from EC sensing head.
3. Remove sensor from packaging.
4. Insert sensor or MEC sensor adapter (4) into the opening. The Dräger label on the sensor must point to the mark on the sensing head housing (5).
5. Lock sensor with bayonet ring.
6. For operation in zone 22 screw in the set screw (2; 2 mm Allen screw) of the sensor bayonet ring until the bayonet ring is locked to prevent accidental loosening.
7. If necessary, mark the transmitter with the label included with the sensor. This allows the gas type to be identified immediately even if the power has failed.
8. Check function of sensor.



00433243.eps

If an identical sensor (with the same part number) was installed immediately before, the transmitter configuration is retained (gas type, measurement range, test gas, calibration interval). Otherwise the preset values of the sensor (see Instructions for Use for the sensor) are uploaded from the transmitter if the sensor lock function (see chapter 8.4.4 on page 24) is deactivated.

10.3 Changing the main electronics

CAUTION

When the main electronics is changed, all settings and parameters must be checked for correctness.

1. Switch off the power to the device or declassify the area according to the local regulations.
2. Loosen the set screw and unscrew the housing cover from the device.
3. Lift the handle and remove the enclosure with the main electronics.
4. Remove the protective caps for the connectors.
5. Unscrew the connector screws for the power supply and relay and withdraw the connector.
6. Change the main electronics.
7. Plug the sensor cable and the connector for the power supply and relay into the corresponding sockets and tighten them.
8. Re-fit the dust caps for the connectors.
9. Re-fit the sensor electronics and enclosure.
10. Screw the housing cover on again and tighten the set screw.
11. Switch on the power to the device.
12. Check and adjust the configuration as required.
13. Calibrate the device if necessary (see chapter 5 on page 15).

11 Disposal

Disposal of electrical and electronic equipment:
EU-wide regulations governing the disposal of electric and electronic appliances which have been defined in the EU Directive 2002/96/EC and in national laws have been effective from August 2005 and apply to this device. Common household appliances can be disposed of using special collecting and recycling facilities. 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 Safety Sales Organization for disposal. Please do not hesitate to contact the above if you have any further questions on this issue.

Disposal of electrochemical sensors
In accordance with the material safety data sheet of the corresponding sensor.

WARNING

Danger of explosions! Do not dispose of in fire, risk of chemical burns! Do not open with force.

Observe the applicable local waste disposal regulations. For information consult your local environmental agency, local government offices or appropriate waste disposal companies.

12 Technical data

CAUTION

Specifications and restrictions in the Instructions for Use and/or data sheets for the sensors used must be observed. For SIL applications the Dräger Polytron 8X00 Safety Manual must be observed.

The measuring range and performance characteristics are dependent on the sensor installed, see the Instructions for Use and/or data sheets for the sensors used.

Signal transmission to the central controller	
Analog	
Output current	4 mA to 20 mA
Drift below zero-point	3.8 mA to 4 mA
Measuring range exceeded	20 mA to 20.5 mA
Device malfunction	≤1.2 mA (configurable)
Fault on analog output	>21 mA
Maintenance signal	3.4 mA (configurable) constant signal or 1 Hz modulation between 3 and 5 mA (selectable)
Supply voltage	
Operating voltage	3-wire shielded cable, 10 to 30 V DC
Inrush current	2.3 A for 0.8 ms at 24 V DC, 10 Ω conductor resistance
Operating current (max.)	80 mA at 24 V DC, no relay, sensor not remote 100 mA at 24 V DC, with relay, remote sensor
Relay design (optional)	Single-pole double throw, 5 A at 230 V AC, 5 A at 30 V DC, resistive load For safety-related applications (SIL2), the maximum contact rating is reduced (see also the Dräger Polytron 8X00 Safety Manual).
Housing	Copper-free aluminum or stainless steel 316L
Protection Class	IP 65/66/67, NEMA 4X
Dimensions (LxWxD)	
Without e-Box	Approx. 180 x 150 x 130 mm (7" x 5.8" x 5.1")
With e-Box	Approx. 185 x 180 x 190 mm (7.3" x 7.1" x 7.4")
Weight	
Without e-Box, aluminum	Approx. 2.2 kg (4.9 lbs.)
Without e-Box, stainless steel 316	Approx. 4.0 kg (8.8 lbs.)
With e-Box, aluminum	Approx. 3.5 kg (7.7 lbs.)
With e-Box, stainless steel 316	Approx. 5.4 kg (11.9 lbs.)
Display	Resolution 128 x 64 pixels, back-lit
Environmental conditions	Specifications for the sensor: see sensor data sheet
Pressure	700 to 1300 hPa (20.7 to 38.4 in. Hg)
Humidity	0 to 100 % R. H., non-condensing
Temperature	–40 to +65 °C (–40 to 149 °F)
Environmental influences	See respective sensor data sheets.

12.1 Torques

(The torques are valid for the aluminum and stainless steel 316 variants)

Part	Torque Lb. In.	Torque Nm
Housing cover	min. 266	min. 30
Sensors	min. 266	min. 30
Plug	min. 266	min. 30
Cable bushing	min. 443	min. 50
Device to e-Box	71	8

If an optional e-Box is being used, fasten the device securely to the e-Box with 4 screws and a tightening torque of 8 Nm.

12.2 Tightening torque and cable size for field wiring terminals

Terminals	Torque Lb. In.	Cable size in AWG	Cable size in mm^2
Power supply and signal	4.4 – 7.0 (0.5 – 0.8 Nm)	24 – 12	0.2 – 2.5
Relay	4.4 – 7.0 (0.5 – 0.8 Nm)	20 – 12	0.5 – 2.5

12.3 Factory settings

12.3.1 Alterable settings for the Polytron 8000

Menu	Standard setting
A1 Alarm	Depending on the sensor
A2 Alarm	
A1 Relay alarm: Direction	Rising (falling with DrägerSensor O_2)
A2 Relay Alarm: Direction	Rising
A1 latching mode	Non-latching
A2 latching mode	Latching
A1 Acknowledgement mode	Acknowledgeable
A2 Acknowledgement mode	Not acknowledgeable
A1 enrg / wired in e-Box	Energized / NO
A2 enrg / wired in e-Box	Energized / NO
Calibration password	_ _ _1
LCD setting	On
Configuration password	_ _ _2
SIL status	Off
Language	English
Fault current	1.2 mA
Warning current	3.0 mA
Warning	Off
Maintenance current	3.4 mA
HART address	0
Auto-cal.	Off
Calibration interval	Depending on sensor
Function key	Faults

12.3.2 Unchangeable settings

Fault	Meaning
Fault relay / wired in e-Box	Energized / NO
Yellow Fault LED	Lights when a fault is present (see chapter 9 on page 27).
Red Alarm LED	Gives single flashes when an A1 alarm is present. Gives double flashes when an A2 alarm is present. If an alarm is configured as acknowledgeable and the alarm is acknowledged, the LED lights. Alarm hierarchy: A2 has a higher priority for the LED than A1. However, the A1 and A2 relays operate independently of one another, i.e. if A1 is acknowledgeable and A2 is not and the gas concentration is so high that A1 and A2 are triggered, an acknowledgement results in the A1 relay dropping out. However the red LED continues to give double flashes as long as the A2 condition exists.

13 Order list

13.1 Dräger Polytron 8000

Name and description	Order Number
Dräger Polytron 8000 EC d A 4-20/HART	4544403
Dräger Polytron 8000 EC d A 4-20/HART relay	4544404
Dräger Polytron 8000 EC d S 4-20/HART	4544412
Dräger Polytron 8000 EC d S 4-20/HART relay	4544413
Dräger Polytron 8000 EC de A 4-20/HART	4544421
Dräger Polytron 8000 EC de A 4-20/HART relay	4544422
Dräger Polytron 8000 EC de S 4-20/HART	4544430
Dräger Polytron 8000 EC de S 4-20/HART relay	4544431
e-Box standard version (power only)	68 12 420
e-Box power / relay / remote version (with 2 cable glands)	68 12 275
Cable gland e-Box, 1x	68 12 868

13.2 Accessories

Name and description	Order Number
Magnetic wand with key chain	45 44 101
Sensor test dongle	83 17 619
Diagnostic dongle	83 17 860
Splash guard	68 12 510
Calibration adapter PE	45 09 314
Calibration adapter PE, Europe	68 06 978
Calibration adapter Viton	68 10 536
Pipe mounting kit, Polytron 5000/8000	45 44 198
Duct mount kit	68 12 725
EC Sensor Head Remote Polytron 8000 with wall-pipe mounting kit	68 12 684
Connector cable with plug Polytron 8000, 5 m (16 ft)	83 23 305
Connector cable with plug Polytron 8000, 15 m (49 ft)	83 23 315
Connector cable with plug Polytron 8000, 30 m (98 ft)	83 23 330
Duct Adapter, EC Sensor Head Remote	83 17 617
MEC sensor adapter Polytron 5000/8000	68 12 695
IR connection kit, 5000/8000	45 44 197
Dräger PolySoft 8000	83 23 406
Dräger PolySoft 8000 Premium	83 23 412

13.3 Replacement parts

Name and description	Order Number
Bucket Polytron 8000 4-20/HART, SPPT	45 44 781
Bucket Polytron 8000 4-20/HART Relay, SPPT	45 44 782
Cable bushing, 3-pin	45 44 182
Cable bushing, 9-pin	45 44 169
Cable bushing, 14-pin	45 44 168
Hardware set, housing	45 44 167
Hardware set, e-Box	68 12 838
Cable gland, e-Box	68 12 868
e-Box PCB	60 12 839
Galvanic Isolator	
Sensor circuit board (EC sensing head local)	
Sensor circuit board (EC sensing head remote)	
Bayonet ring	

14 Declaration of conformity

EG-Konformitätserklärung
EC-Declaration of Conformity

Dokument Nr. / *Document No.* SE23109-01

Wir / *we* Dräger Safety AG & Co. KGaA, Revalstraße 1, 23560 Lübeck, Germany

erklären in alleiniger Verantwortung, dass das Produkt
declare under our sole responsibility that the product

Gasmess-Transmitter Typ E/I/XTR 04/5 (Polytron 8**0)**
*Gas Detection Instrument type E/I/XTR 04/5** (Polytron 8**0)*

mit der EG-Baumusterprüfbescheinigung
is in conformity with the EC-Type Examination Certificate **PTB 11 ATEX 1005X**

ausgestellt von der benannten Stelle
issued by the Notified Body
PTB
Bundesallee 100
D-38116 Braunschweig

Kenn-Nr. der benannten Stelle
Identification Number of Notified Body **0102**

und mit den folgenden Richtlinien unter Anwendung der aufgeführten Normen übereinstimmt
and with the following directives by application of the listed standards

Bestimmungen der Richtlinie *provisions of directive*	**Nummer sowie Ausgabedatum der Norm** *Number and date of issue of standard*
94/9/EG: **ATEX-Richtlinie** *94/9/EC: ATEX Directive*	EN 60079-0:2009, EN 60079-1:2007, EN 60079-7:2007, EN 60079-11:2012, EN 60079-31:2009
2004/108/EG: **EMV-Richtlinie** *2004/108/EC: EMC Directive*	EN 50270:2006 (type 2), EN 61000-6-3:2007
2006/95/EG: **Niederspannungs-Richtlinie** *2006/95/EC: Low Voltage Directive*	EN 61010-1:2010

Überwachung der Qualitätssicherung Produktion durch
Surveillance of Quality Assurance Production by
DEKRA EXAM GmbH
Dinnendahlstraße 9
D-44809 Bochum

Kenn-Nr. der benannten Stelle
Identification Number of Notified Body **0158**

Lübeck, 2012-10-26

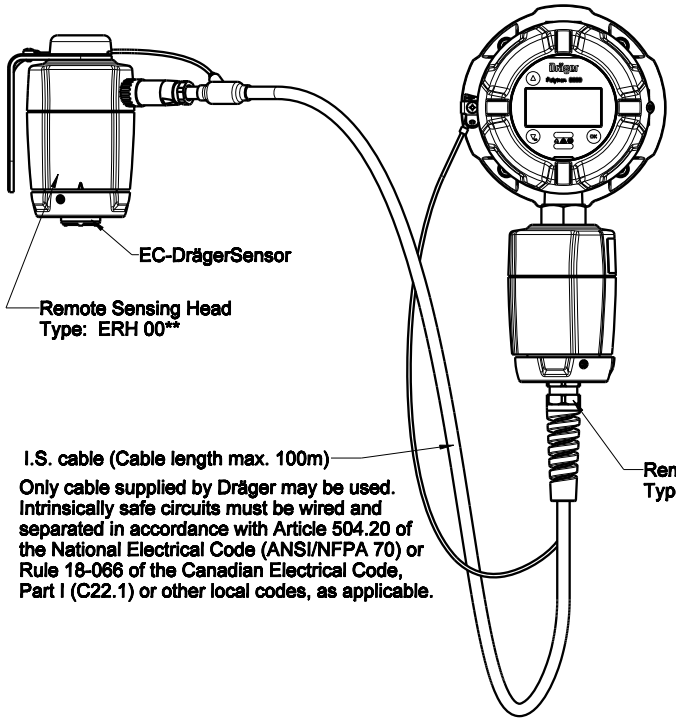
Ort und Datum (jjjj-mm-tt)
Place and date (yyyy-mm-dd)

Ingo Pooch
Leiter
Forschung & Entwicklung
Gasmessgeräte

Ingo Pooch
Manager
Research & Development
Gas Detection Instruments

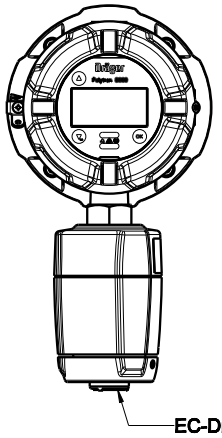
HAZARDOUS AREA: Class I, Div. 1, Groups A, B, C, D; Class II, Div. 1, Groups E, F, G

Gas Detection Transmitter
Type: ETR 04, ETR 05****
with Remote Sensor



Only cable supplied by Dräger may be used. Intrinsically safe circuits must be wired and separated in accordance with Article 504.20 of the National Electrical Code (ANSI/NFPA 70) or Rule 18-066 of the Canadian Electrical Code, Part I (C22.1) or other local codes, as applicable.

Gas Detection Transmitter
Type: ETR 04, ETR 05****
with Local Sensor



Non I.S. field wiring ratings

Supply: 10…30 VDC, 0.1…0.35 A
Um = 250 V (only for I.S. considerations)
Relays (optional): 5 A, 30 VDC or 230 VAC

Note: Suitability for installation in particular applications is at the discretion of the Authority Having Jurisdiction (AHJ).

PROJEKTIONSMETHODE 1 NACH DIN ISO 5456
FIRST ANGLE PROJECTION ACCORDING TO ISO 5456

Werkstoff / Material	Änderungstext / Modification Text

Allgemeintoleranzen / General Tolerance: ---

=EX=	=QA=	=QB=	=QC=	Fabr.-Nr./ Serial-No.	Reg./ Registration	Begr.-Lzeit/Age Monit.	Maßstab / Scale
--	--	--	--		Nein/No		7:20

Bearbeitung / Created by	Datum / Date (dd.mm.yyyy)	Verantwortlich / Checked by	Datum / Date (dd.mm.yyyy)	Abteilung / Department	DCC Nummer / DCC Number
Vornb&umen	25.10.2012	Treptow	25.10.2012	s15430	//

Dräger

Benennung / Description: Control Drawing ETR 04/5**

Kommt vor / Amends: 0X
Reifegrad / Status: Prep
Sachnummer / Part No. - ÄZ / Rev.: SE23161 - 00
Dokumententyp / Document Type: Pro/E A3 | Seite / Page: 1 | von / of: 1
Ersatz für/ Repl. for: SE23161-xx

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