Dräger Polytron 7000

Approved as type P3U and type P3FB

Instructions for use

Dräger. Technology for Life®

Contents

1 Safety-related information

1.1 General safety notes

- Before using this 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 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 (see chapter 8). 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 recommends a Dräger service contract for all maintenance activities.
- Only use genuine Dräger spare parts and accessories when performing maintenance work, or the proper functioning of the product may be impaired.
- Do not use a faulty or incomplete product. Do not modify the product.
- If a pump module is used, care must be taken when opening the gas detector. Through an existing glass tube there is risk of breakage and injury.
- If a pump module is used, do not block the lower gas inlet of the pump module. This can destroy the sensor.

1.2 Use in areas subject to explosion hazards

- Equipment and components which are used in explosion-hazard areas and which have been inspected and approved in accordance with international or European explosion-protection regulations may be used only under the specified conditions.
- In applications, which require devices of category 1G (zone 0) resp. EPL Ga, intensive electrostatic charging processes have to be prevented.
- Not for use in oxygen enriched atmospheres, i.e. more than 21 Vol% oxygen.
- If fitted at the time of delivery, or retrofitted at a later stage, with the relay module and/or the pump module, the device loses its explosion protection approval. Operation of the device with the pump module and/or the relay module installed is not permitted in explosion-hazard areas.
- When measured gas is aspirated from explosion-hazard areas, suitable explosion protection measures are required, e.g. use of flame arresters.

1.3 Electrical installation

- The relevant regulations for routing and connecting of power and signal lines to gas detection systems must be strictly adhered to.

- The electric network (gas detector and alarm devices) in which the gas detector is installed must be equipped with a circuit breaker or a fuse.
- The circuit breaker or fuse must be easily accessible and must be marked as belonging to the gas detector.
- Observe the operational temperature range of the cables. Electric strength of the cable insulation corresponding to the supply for the alarm devices that are connected to the relays.
- If the gas detector is not connected to a controller, an alarm signalling device must be connected to the fault relay.

2 Conventions in this document

2.1 Meaning of the warning notes

The following warning notes are used in this document to notify users of possible dangers. The meanings of the warning notes are defined as follows:

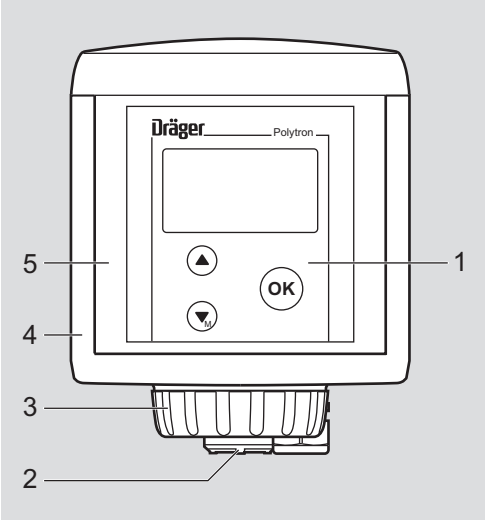
Alert icon	Signal word	Consequences in case of nonobservance
⚠	WARNING	Indicates a potentially hazardous situation. If not avoided, it could result in death or serious injury.
⚠	CAUTION	Indicates a potentially hazardous situation. If not avoided, it could result in physical injury. It may also be used to alert against unsafe practices.
	NOTICE	Indicates a potentially hazardous situation. If not avoided, it could result in damage to the product or environment.

2.2 Trade marks

- HART® is a registered trademark of the HART Communication Foundation.
- PROFIBUS® is a registered trademark of the PROFIBUS Nutzerorganisation e. V.
- FOUNDATION™ is a registered trademark of the Fieldbus Foundation.

3 Description

3.1 Product overview



1	Control panel with display (see section 4)
2	Sensor
3	Bayonet ring
4	Docking Station
5	Measurement module

3.2 Functional description

The Dräger Polytron 7000 is a stationary gas detector and is used for the monitoring of toxic gases and oxygen. The device converts the measured gas concentration into an electrical signal for further processing.

Frequency of the calculation of the measured value: 1 x per second (updating of the display, the 4-20-mA interface and the relays).

3.3 Configuration options

Ex works, the gas detector is configured with different interfaces and accessories.

3.3.1 Sensors

The gas detector is intended for the use of the DrägerSensor EC (electrochemical).

3.3.2 Interfaces

Interface	Type	Explosion protection approval
4-20 mA	P3U	Yes
4-20 mA/HART	P3U	Yes

Interface	Type	Explosion protection approval
PROFIBUS PA	P3FB	Yes
FOUNDATION Fieldbus H1	P3FB	Yes
LON (Local Operating Network)	–	No

3.3.3 Accessories

Accessories	Function	Explosion protection approval
Pump module (8317350)	Aspiration of measured gas	No
Relay module (8317360)	Local switching of actuators	No
Daisy chain installation kit (8317282)	Connection of multiple gas detectors to one bus line (multidrop installation)	Yes
Remote sensor (8317275)	Installation of the sensor at a distance of up to 30 m from the measurement module.	Yes
Duct and pipe adapter (Duct mounting kit)	Installation of the gas detector to a pipe in order to measure the gas concentration inside it.	Yes
Duct adapter for remote sensor (8317617)	Installation of a remote sensor to a pipe in order to measure the gas concentration inside it.	Yes
Calibration adapter V (6810536)	Supply of test gas	No
Calibration adapter AC (6809380)	Supply of test gas together with the pump adapter (8317976)	No
Pump adapter (8317976) for AC sensor	Gassing of an AC sensor by means of the pump integrated in the gas detector	No
Dongles	Activation of additional functions	
Sensor-test dongle (8317619)	Sensor test functions that ensure the reliability and functionality of the sensor and of the gas warning device	Yes
Diagnostic dongle (8317860)	Sensor diagnostics feature (including sensor tests) to determine the strain and the remaining sensor life time	Yes

Accessories	Function	Explosion protection approval
Data dongle (8317618)	Data and event logging feature – stores measured values and events such as alarms and faults. Enables graphic plotting of the measured values on a 15-minute time axis.	Yes

ℹ For information about additional accessories refer to the corresponding Dräger product information.

3.4 Intended use

In combination with the integrated DrägerSensor, the gas detector is intended for continuous monitoring of gas concentrations.

For installation in:

Explosion-hazard area	Zones 0, 1, 2; Mining
Category	1G, 2G, 3G; M1
UL-/CSA area	Class I & II; Div. 1 & 2

3.5 Approvals

Depending on the interface, the gas detector is approved under the type designation P3U or P3FB (see section 3.3.2 Interfaces).

3.5.1 ATEX

Device marking in accordance with 2014/34/EU

Types P3U & P3FB

BVS 03 ATEX E 406 X

CE 0158 Ex II 1G / I M1

Ex ia IIC T4 Ga	-40 °C ≤ Ta ≤ +65 °C (-40 °F ≤ Ta ≤ +149 °F)
Ex ia IIC T6 Ga	-40 °C ≤ Ta ≤ +40 °C (-40 °F ≤ Ta ≤ +104 °F)
Ex ia I Ma	-40 °C ≤ Ta ≤ +65 °C (-40 °F ≤ Ta ≤ +149 °F)

CE 0158 Ex II 3G

Ex ic IIC T4 Gc	-40 °C ≤ Ta ≤ +65 °C (-40 °F ≤ Ta ≤ +149 °F)
Ex ic IIC T6 Gc	-40 °C ≤ Ta ≤ +40 °C (-40 °F ≤ Ta ≤ +104 °F)

Power supply: U_i = 30 V, I_i = 0.3 A, P_i = 700 mW, C_i = 5 nF, L_i = 50 µH

Year of manufacture (via serial number)[1)]
Dräger Safety, 23560 Lübeck, Germany

Type P3U

Safety-related characteristic values for the supply and signal circuit (outer terminals of the docking station):
Ui = 30 V, I_i = 0.3 A, P_i = 700 mW, C_i = 5 nF, L_i = 50 µH

Type P3FB

FISCO bay unit
Power supply: U_i = 24 V, I_i = 0.38 A, P_i = 5.32 W, C_i = 5 nF, L_i = 10 µH

3.5.2 IECEx

Types P3U & P3FB

Ex ia IIC T4 Ga	-40 °C ≤ Ta ≤ +65 °C (-40 °F ≤ Ta ≤ +149 °F)
Ex ia IIC T6 Ga	-40 °C ≤ Ta ≤ +40 °C (-40 °F ≤ Ta ≤ +104 °F)
Ex ia I Ma	-40 °C ≤ Ta ≤ +65 °C (-40 °F ≤ Ta ≤ +149 °F)
Ex ic IIC T4 Gc	-40 °C ≤ Ta ≤ +65 °C (-40 °F ≤ Ta ≤ +149 °F)
Ex ic IIC T6 Gc	-40 °C ≤ Ta ≤ +40 °C (-40 °F ≤ Ta ≤ +104 °F)

IECEx BVS 04.0003X
Year of manufacture (via serial number)*
Dräger Safety, 23560 Lübeck, Germany

Type P3U

Power supply: U_i = 30 V, I_i = 0.3 A, P_i = 700 mW, C_i = 5 nF, L_i = 50 µH

Type P3FB

FISCO bay unit
Power supply: U_i = 24 V, I_i = 0.38 A, P_i = 5.32 W, C_i = 5 nF, L_i = 10 µH

3.5.3 UL

CLASSIFIED UL 9N54

Types P3U & P3FB

Only in accordance with intrinsic safety classified for operation in explosion-hazard areas.
Class I, Div. 1&2, Groups A, B, C, D
Class II, Div. 1&2, Groups E, F, G

Use in accordance with Dräger control drawing SE20105.

1) Structure of the serial numbers: The third letter of the serial number indicates the year of manufacture: M = 2019, N = 2020, P = 2021, R = 2022, S = 2023, T = 2024, U = 2025, W = 2026, X = 2027, Y = 2028, Z = 2029 etc. (letters G, I, O, Q are omitted)
Example: Serial number ARMB-0001: The third letter is M, meaning that the device was manufactured in 2019.

T4	-40 °C ≤ Ta ≤ +65 °C (-40 °F ≤ Ta ≤ +149 °F)
T6	-40 °C ≤ Ta ≤ +40 °C (-40 °F ≤ Ta ≤ +104 °F)

Type P3U

Power supply: V_{max} = 30 V, I_{max} = 0.3 A, P_i = 700 mW, C_i = 5 nF, L_i = 50 µH

Type P3FB

FISCO bay unit
Power Supply: V_{max} = 24 V, I_{max} = 0.38 A, P_{max} = 5.32 W, C_i = 5 nF, L_i = 10 µH

3.5.4 CSA

LR97594
NRTL/C

Types P3U & P3FB

Intrinsic safety
Class I, Div. 1, Groups A, B, C, D
Class II, Div. 1, Groups E, F, G

Use in accordance with Dräger control drawing SE20106.

Type P3U

Power supply: V_{max} = 30 V, I_{max} = 0.3 A, P_{max} = 700 mW, C_i = 5 nF, L_i = 50 µH

Type P3FB

FISCO bay unit
Power supply: V_{max} = 24 V, I_{max} = 0.38 A, P_{max} = 5.32 W, C_i = 5 nF, L_i = 10 µH

4 Use

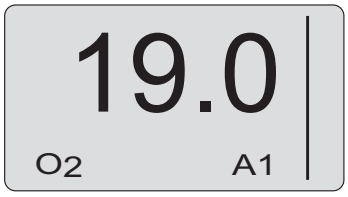
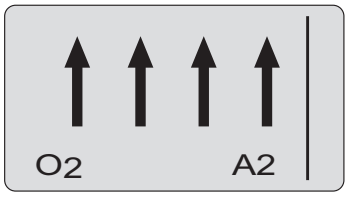
ℹ In addition to the control panel, the unit can also be operated using, for example, the Dräger PolySoft software, FDT applications or manual control units.

If individual parameters were changed with a configuration software, all parameters from the device must be read back and verified manually.

4.1 Display

4.1.1 Measuring mode

Example display	Description
	Normal operation – The display shows the gas concentration, the measured gas and the unit of measure.

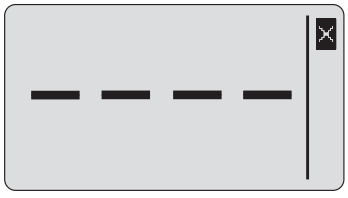
Example display	Description
	Overshooting (in the case of O_2 also undershooting) of the alarm thresholds – The display in the example shows the pre-alarm A1.
	Overshooting the full scale value specified for the sensor (see instructions for use/data sheet for the sensor) **4-20-mA interface:** Full-scale value **Relay:** A2 relay energised

4.1.2 Special state

No monitoring of the gas concentration and/or alarm state occur in the special state.

Special states on the gas detector exist in the following cases:

- Negative gas concentration
- Fault
- Disabled alarms (display readout and analogue/digital measured value readout remains active)
- Calibration procedures
- Warm-up phase
- Maintenance

Example display	Description
	Maintenance – When certain functions are invoked (e.g. calibration, sensor replacement function), the display shows the symbol . **4-20-mA interface:** Maintenance signal **Relay:** Energised or not energised depending on function
	General error – The display shows the symbol . **4-20-mA interface:** Fault signal **Relay:** Fault relay energised
	A warning is present. The display shows the symbol . **4-20-mA interface:** Measured value[1)] **Relay:** Fault relay energised (with a disabled alarm)

1) The warning signal is also issued for the measured value when a warning signal is selected. Factory setting: Warning signal disabled.

Conduct during warm-up phase 1

4-20-mA interface: Maintenance signal
Relay: Fault relay energised
During warm-up phase 1 the display shows the time remaining until warm-up phase 1 is completed.

Conduct during warm-up phase 2

4-20-mA interface: Measured value
Relay: Fault relay not energised
During warm-up phase 2 the display shows the measured value.

Undershooting the measuring range (O_2 sensors only)

If the measured value drops below the measuring range set, the 4-20-mA interface emits 3.8 mA ... to 4 mA and the display shows the symbol .

If the measured value drops further, the gas detector behaves in the same way as for a general error. The 4-20-mA interface issues the fault signal, the display shows the symbol and the fault relay is energised.

Undershooting the measuring range is a non-latching error. If the measured value is again in the measuring range, the error is no longer issued.

4.1.3 Meaning of the symbols

Symbols on the right side of the displays indicate the device state. Some symbols are only displayed if the gas detector is operated with the corresponding component.

Symbol	Explanation
	A fault is present. Fault signal is issued.
	A warning is present. A warning signal is issued.[1)]
	A maintenance signal is issued.
	Pump is installed.
	Pump flow error
	The configured full scale value is overshot in the 4-20 mA interface
	The configured threshold limit value is undershot in the 4-20-mA interface.
	Polling address of the analogue interface is set to a fixed value (Multidrop operation) and transmits via HART.
	Sensor diagnostic function – The sensor is ready for operation.
	Sensor diagnostic function – The sensor is ready for operation but nearing the end of its operating lifetime.
	Sensor diagnostic function – The sensor is ready for operation but should be replaced soon.

Symbol	Explanation
	The buffer mode of the data logger is set to overwriting (roll).
	The buffer mode of the data logger is set to holding (stack).

1) If the device is in maintenance mode (e.g. warm-up phase 1), the maintenance signal is issued instead of the warning signal.

4.1.4 LED indication for LON version

The LON version of the gas detector has three LEDs located behind the display.

LED display	Meaning
The green LED is illuminated	The gas detector is functioning properly.
The green LED is flashing	A warning is present.
Orange LED	The gas detector communicates with the control unit via LON.
Red LED	An error is present.

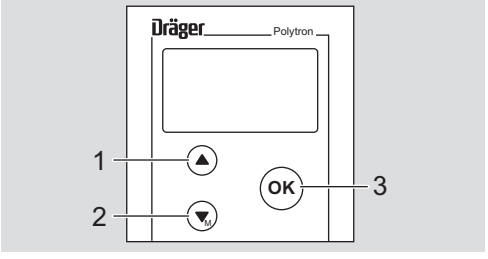
4.1.5 Checking the display for proper functioning

In order to recognise defective pixels in the display, it is possible to invoke the ***Show Fault Codes*** menu image.

The menu image is suited since it shows many contiguous pixels, making it possible to recognise line, column or individual pixel faults. Displayed fault codes are not relevant in this context.

1. Open the menu (see chapter 4.4.3).
2. In the menu, select ***Information*** > ***Instrument*** > ***Show Fault Codes***.
3. Check if all pixels are displayed.

4.2 Control panel



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1	Up key or function key
2	Down key or menu key
3	OK key

4.3 Info mode and function key

4.3.1 Info mode

In measuring mode, the Info mode can additionally be activated. It provides an overview of device information presented on multiple pages.

Example display	Description
Page 1 07.11.2011 12:34 SW Version : 8.0 Part No. : 8317778 Serial No. : ARUA0001 DeviceCode: 00006317 1/4 Instrument Info	Device information Line 1 – Date and time Line 2 – Software version Line 3 – Device part no. Line 4 – Device serial no. Line 5 – Device code
Page 2 Sensorname: O_2 Part No. : 6809630 Serial No. : XXXXXXX EEPROM Typ : 1 EEPROM Vers.: 1 2/4 Sensor Info	Sensor information Line 1 – Sensor name Line 2 – Sensor part no. Line 3 – Sensor serial no. Line 4 – EEPROM type Line 5 – EEPROM version
Page 3 Gasname : O_2 Range : 25.00 Vo 4–20 SP : 25.00 Vo Alarm A1 : 19.00 Vo Alarm A2 : 23.00 Vo 3/4 Sensor Config.	Sensor settings Line 1 – Gas name Line 2– Measuring range (cannot be edited) and unit of measurement Line 3 – Measuring range for the analogue interface Displayed only if the analogue interface card is installed Line 4 – Alarm threshold A1 and unit [1] Line 5 – Alarm threshold A2 and unit [1]
Page 4 [2] Power : XXX % Fault : X.X l/min Warning : X.X l/min Op.time : XXXX h 4/4 Pump info	Pump information Line 1 – Pump output Line 2 – Flow threshold for error Line 3 – Flow threshold for warning Line 4 – Running time of the pump

1) Displayed only if a relay module is used!
2) Displayed only if a pump module is used!

4.3.2 Activating Info mode

- In measuring mode, press ▲ and hold down for approx. 3 seconds.

4.3.3 Navigation in Info mode

Key	Function
▲	Scrolls to the next page.
▼	Scrolls to the previous page.
OK	Exits Info mode.

After 30 seconds without key operation, the gas detector automatically exits the Info mode.

4.3.4 Using the function key

The function key can be used to directly invoke a function that has been assigned to the function key. By default, the error log is displayed.

- In measuring mode, press ▲ and hold down for approx. 1 second.

For configuring of the function key (see section 9.7 Configuring the function key).

4.4 Menu

4.4.1 Menu navigation

Key	Function
▲	Navigates upward. Sets values.
▼	Navigates downward. Sets values.
OK	Confirms inputs. Selects menus and functions.

4.4.2 Passwords

Calibration password	Access to – ***Information*** menu – ***Calibration*** menu Factory setting: **_ _ _ 1**
Settings password	Access to – ***Information*** menu – ***Calibration*** menu – ***Settings*** menu Factory setting: **_ _ _ 2**

For setting the passwords, see section 9.3.

4.4.3 Opening the menu

- To open the ***Information*** directly: In measuring mode, press ▼ and hold down for approx. 1 second.
- To open the ***Information*** and ***Calibration*** menus:
  a. In measuring mode, press ▼ and hold down for approx. 3 seconds.
  b. Select ***Enter password***.
  c. Enter the calibration password.
- To open all menus:
  a. In measuring mode, press ▼ and hold down for approx. 3 seconds.
  b. Select ***Enter password***.
  c. Enter the settings password.

4.4.4 Reading out information

In the menu ***Information*** choose the appropriate menu item:

Instrument	
Show Notice	Shows existing warnings. For troubleshooting with respect to the warning number displayed (e.g. #58) see section 7.2. If multiple warnings are present, this is indicated (e.g. 1/3 = page 1 of 3.).
Show Fault	Shows existing errors. For troubleshooting with respect to the error number displayed (e.g. #100) see section 7.1. If multiple errors are present, this is indicated (e.g. 1/3 = page 1 of 3.).
Show Fault Codes	Shows present error and warning codes in a table. If all numerical groups are displayed with "00", no error is present.
Show Module	Shows the installed hardware modules. To show detailed information, select module in the menu. ■ = The module is installed □ = The module is not installed The detailed information also shows the software version of the module which is used.
Sensor	
Vitality[1)]	Shows the remaining sensor vitality in %. Dräger recommends to replace the sensor when the vitality < 25 %.
Last Cal. Date	Shows the date of the last calibration.
Next Cal. Date	Shows the due date for the next calibration.
Show sensort-emp.	Shows the current and the max. measured sensor temperature values.
Datalogger	
Datalogr. status[2)]	Shows for the data logger and for the event logger respectively whether they are switched on or off.
Show graph[2)]	Represents the measured values on a time axis of 15 minutes.

1) Only works with the diagnostic dongle
2) Only works with the data dongle

5 Installation and commissioning

5.1 Mounting the measurement module

5.1.1 Preparing the docking station

Prerequisite:

– Docking station is mounted and wired.
(as per assembly instructions Dräger Docking Station for Polytron® 3000/7000)

1. Remove the dust and rain protector, if in place.
2. Inspect the sealing of the docking station for contamination, clean if necessary.

3. From the inside, check the position of the eccentric screws.
   The screws must be in engaged position, with the eccentric opening pointing upward.

30567

4. Using a 5 mm Allen key (without spherical head), correct the position of the eccentric screws, if necessary.

5.1.2 Connecting the measurement module with the docking station

NOTICE

Ingress of humidity

If the measurement module is not flush with the docking station, humidity can enter, damaging the gas detector.

► Make sure that the measurement module is correctly seated in the docking station.

1. Horizontally slide the measurement module into the docking station and lower it.
   ⇒ The front of the measurement module is flush with the docking station. A gap of approx. 3 mm (0.12") remains at the top between docking station and measurement module.

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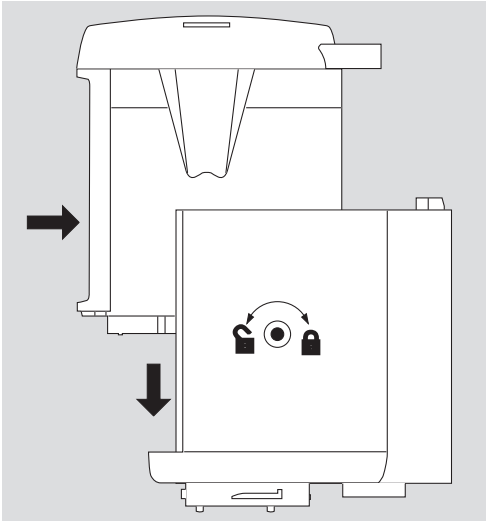


2. Using the 5 mm Allen key (without spherical head), turn the eccentric screws approx. 180° in clockwise direction towards 🔒.
   ⇒ The gap at the top between docking station and measurement module closes.
   ⇒ The measurement module is locked.

5.2 Installing the sensor

ⓘ If the gas detector is already switched on and an existing sensor is to be replaced, see section 8.2.

Prerequisite:

– Measurement module is installed.

1. Loosen the hexagon socket screw at the bayonet ring.
2. Unscrew the bayonet ring from the gas detector.
3. Remove the blank disk.
4. With the Dräger logo pointing forward, insert the sensor into the sensor opening.
5. Screw the bayonet ring back on.
6. Tighten the hexagon socket screw at the bayonet ring.

5.3 Alarm devices (only with relay module)

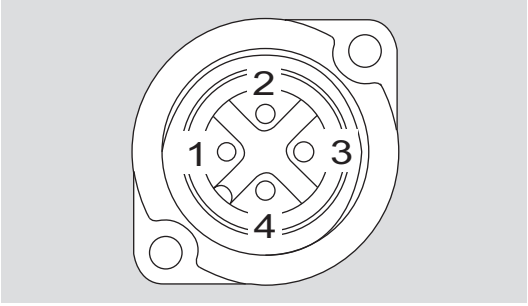
If alarm devices are to be operated, the electrical connection of the docking station must be in 3-wire technology (see assembly instructions Dräger Docking Station for Polytron® 3000/7000).

5.3.1 Information about connecting

Three potential-free relay outputs are available at the relay module:

– alarm relay A1 (pre-alarm)
– alarm relay A2 (main alarm)
– fault relay (fault signal)

Pin-out of the relay plug



37207

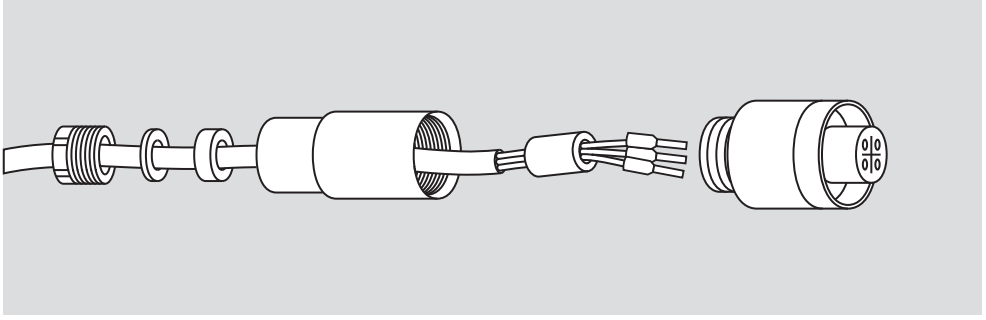
1	normally closed
2	common
3	normally open
4	not connected

5.3.2 Connecting alarm devices

⚠ WARNING
Risk of electric shock
Potential differences can lead to insulation faults.
► Do not combine electrical loads with different voltage types (AC or DC).
► If DC loads are used, make sure that only devices with identical rated DC voltages are controlled via the relay contacts (e.g. ≤ 120 V).
► If AC loads are used, make sure that only the relay contacts are only connected to devices with which they share one phase.

⚠ WARNING
Risk of electric shock
Improper use can lead to personal injury.
► Before plugging in or unplugging the relay plug, disconnect alarm devices from the power supply.

Equipment
– connection cable
  diameter of the connection cable: 6 to 9.5 mm
  diameter of the individual wires: 3 mm max.
  cable core cross-section: 2.5 mm^2 (AWG 14)
– ferrite sleeve
– ferrules
– cable bushing (order no. 18 90 086)

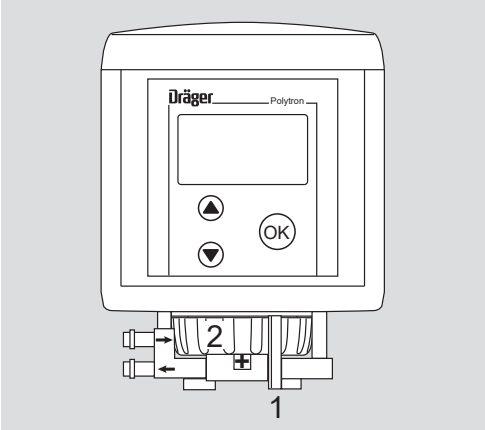


Procedure:
1. Mount the cable bushing with the ferrite sleeve to the connection cable. Screw all connections tight.
2. Make a note the pin-out of the relay outputs on the label of the relay cap.
3. Insert and lock the connection cable.
4. Close the relay cap.

5.4 Pump adapter (only with pump module)

If the pump module is to be operated, the electrical connection of the docking station must be in 3-wire technology (see assembly instructions Dräger Docking Station for Polytron® 3000/7000).

5.4.1 Mounting the pump adapter



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1. Loosen the hexagon socket screw at the bayonet ring.
2. Unscrew the bayonet ring (2) from the gas detector.
3. If necessary, insert the sensor.
4. Place the mounting ring (1) of the pump adapter over the sensor opening.
5. Screw the bayonet ring back on.
6. Tighten the hexagon socket screw at the bayonet ring.
7. Observe the installation direction of the pump adapter.
   The installation direction certain the direction of gas flow between pump and sensor (mode of operation).

Mode of operation	Description
Grommets for supply and waste air point to the left, ⊕ symbol points to the front	The pump is upstream of the sensor in the gas flow; the sensor is on the overpressure side of the pump. This is the preferred mode of operation for all sensors.
Grommets for supply and waste air point to the right, ⊖ symbol points to the front	The pump is downstream of the sensor in the gas flow; the sensor is on the negative pressure side of the pump. This mode of operation should be chosen only in justified cases. For the DrägerSensor O_2LS (6809630) the mode of operation is only permissible up to a maximum flow rate of 0.5 L/min. This mode of operation is not permitted for the Dräger-Sensor O_2 (6809720).

8. Insert the bushings of the pump adapter into the bore holes in the underside of the docking station.
   ⇒ The sealing slides over the sensor.
9. Turn the mounting ring in clockwise direction until the pump adapter is secured.

5.4.2 Information about the installation of the aspiration line

The selection of the material of the aspiration hose/aspiration pipe and the aspiration distance influence the response time of the measured signal. In the worst case, reaction with the material used or absorption can result in no measurable gas concentration reaching the sensor.

A pressure difference between the aspiration location and the environment of the gas detector can lead to an additional measuring error. The maximum permissible pressure difference is 50 mbar.

ℹ Contact Dräger for information about selecting a suitable hose/pipe material.

5.5 Commissioning the gas detector

Prerequisite:

– The sensor is installed.

1. Switch on the power supply.
   ⇒ The gas detector starts the warm-up phase.
   ⇒ The time remaining until the sensor reaches operational readiness. The maintenance signal is issued. If a relay module is installed, the fault relay is energised.
2. Wait until the warm-up phase is completed.
   Depending on the installed sensor, the warm-up phase can take between 5 minutes and 12 hours.
   It is already possible to make settings in the menu:
3. Calibrate the sensor (see section 6).
4. Perform tests:
   - Check signal transmission to the control unit.
   - Test the alarm relay and the fault relay (only with relay mode, see section 9.2.6).
5. If a pump module is used:
   - Check the aspiration path for tightness.
   - Compare the flow rate at the aspiration location and downstream of the gas detector.

6 Calibration

Calibration involves adjusting the zero-point and the sensitivity of the sensor.

6.1 Test gases

Depending on the type of calibration, different test gases are used.

Zero gas

Zero gas is a test gas used for zero-point adjustment. The zero gas used can be fresh air from the ambient atmosphere. The fresh air must be free from the measured gas or other substances that have cross-sensitivity. Nitrogen (N_2) is used in the case of O_2 sensors.

Target gas

Target gas is a test gas used for sensitivity adjustment. The target gas used can be the measured gas or a surrogate gas. In the case of O_2sensors, no target gas is needed, and the oxygen from the ambient air (fresh air) is used.

6.2 Preparing the test gas supply

The mode of test gas supply depends on whether the gas detector is equipped with a pump module or not.

Prerequisite:

– The warm-up phase of the sensor is completed (see section 5.5 Commissioning the gas detector).
– Date and time have been set (see section 9.4).

⚠ WARNING
Health hazard from test gas
Breathing in of test gas can be harmful to health or lead to death.
► Do not inhale the test gas.
► Observe risks connected with the test gas, hazards notes and safety advice (see for example safety data sheets, instructions on the testing media).

⚠ CAUTION
Alarms triggered by test gas
Test gas that is still present can trigger alarms.
► Make sure that the supply of test gas is ended.

6.2.1 Gas detector without pump module

The test gas must be fed without being pressurised. This corresponds, e.g. if a test gas cylinder is used, a flow rate of 500 mL/min. If test gas ampoules are used, unpressurised supply is automatically the case.

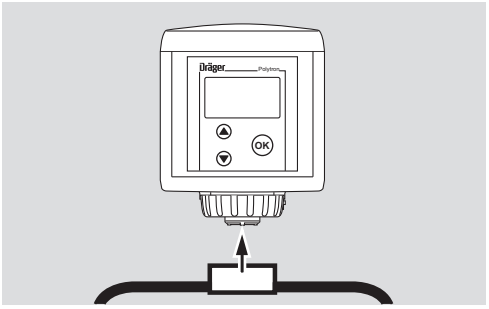
Option **Using a test gas cylinder**

Equipment:

– test gas cylinder with pressure reducer, in the case of aggressive gases with stainless steel pressure reducer
– calibration adapter with hose nozzles (order no. 68 10 536)
– hose, type appropriate to the gas properties (e.g. FKM hose order no. 12 07 068)

1. Connect hose to calibration adapter and test gas cylinder.
2. To discharge the test gas, connect a hose to the second connection of the calibration adapter.

3. Plug the calibration adapter onto the sensor.



29115

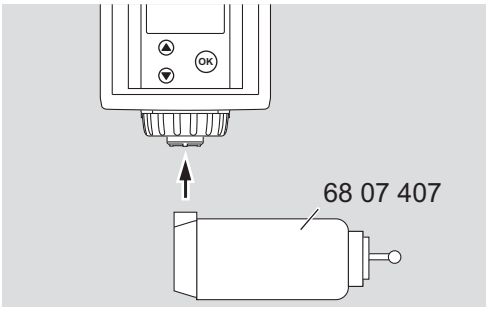
Option **Using test gas ampoules**

Test gas ampoules are only used for the sensitivity adjustment for the target gas.

Equipment:

– calibration flask (order no. 68 03 407) with the corresponding adapter
– Test gas ampoule

- Plug the calibration flask onto the sensor.



29117

6.2.2 Gas detector with pump module

If a pump module is used, equipment is required that makes it possible to feed the unpressurised test gas into the volume flow of the pump.

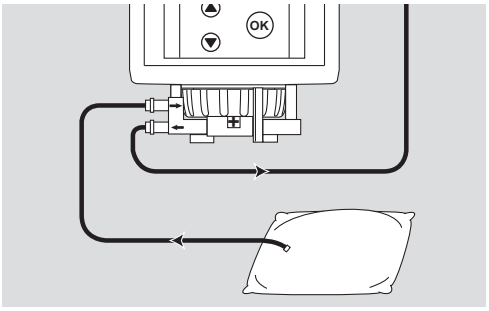
Option **Using a gas bag**

Equipment:

– Gas bag
– Test gas cylinder
– hose, type appropriate to the gas properties (e.g. FKM hose order no. 12 07 068)

- Connect hoses to the pump module.

Do not connect the hose to the gas bag until calibrating.



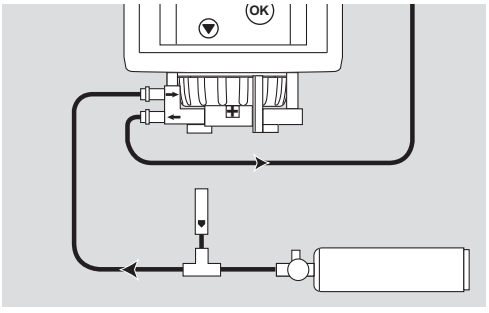
31496

Option **Using test gas cylinder and flowmeter**

Equipment:

– test gas cylinder with pressure reducer, in the case of aggressive gases with stainless steel pressure reducer
– hose distributor
– flowmeter
– hose, type appropriate to the gas properties (e.g. FKM hose order no. 12 07 068)

- Connect hoses. Integrate flowmeter with hose distributor.



31495

Option **Using a test gas ampoule**

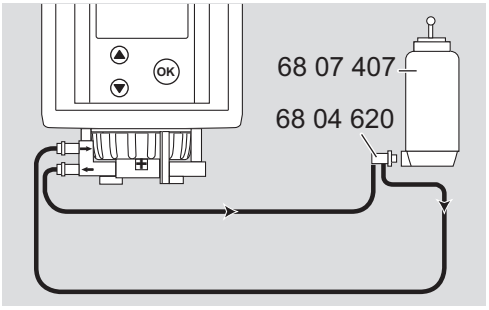
Test gas ampoules are only used for the sensitivity adjustment for the target gas.

Equipment:

– calibration flask (order no. 68 03 407)
– adapter (order no. 68 04 620)
– Test gas ampoule
– hose, type appropriate to the gas properties (e.g. FKM hose order no. 12 07 068)

1. Plug the adapter onto the calibration flask.

2. Connect hoses.



29119

6.3 Adjusting the zero-point

Prerequisite:

– The warm-up phase of the sensor is completed (see section 5.5).
– Test gas supply is prepared (see section 6.2).

Zero adjustment can be aborted at any time. To abort during calibration, select ***Previous***.
If no entries are made, the gas detector automatically switches over to measuring mode after 15 minutes.

Procedure, using an EC-H_2S sensor as an example

1. Select ***Calibration*** > ***Zero calibration*** > ***EC-H_2S***.
   ⇒ The 4-20 mA interface issues the maintenance signal.
2. Supply zero gas or fresh air, respectively:

Option	Description
Test gas cylinder	Set the pressure reducer to a flow rate of 500 mL/min.
Gas bag	Fill the gas bag using the test gas cylinder. Connect hose leading to the pump module with gas bag.
Test gas cylinder and flowmeter	Slowly open the pressure reducer of the test gas cylinder until the flowmeter indicates a flow.

3. Select ***Next***.
   ⇒ The current value and the gassing time are displayed.

   In the case of EC-O_2 sensors, only checking of the zero-point value is performed instead of zero adjustment. The zero-point value must be less than 0.6 volume percent. If this is not the case, an error is set in the sensor.
4. When the displayed measured value has stabilised (max. wait time = 3 minutes), select ***calibrate***.
5. End the zero gas supply.
6. Select ***Back to menu***.

6.4 Span calibration

Prerequisite:

– Zero adjustment has been performed (see section 6.3).
– Test gas supply is prepared (see section 6.2).

Span calibration can be aborted at any time. To abort during calibration, select ***Previous***.
If no entries are made, the gas detector automatically switches over to measuring mode after 15 minutes.

Procedure, using an EC-H_2S sensor as an example

1. Select ***Calibration*** > ***Span calibration*** > ***EC-H_2S***.
   ⇒ The 4-20 mA interface issues the maintenance signal.
   ⇒ The values for the span calibration using the target are displayed.
   Example:
   "***Cal.gas : H_2S***
   Cal.unit : ppm
   Concentr.: 000025"
   If the displayed values do not match the target used, use the control keys to adjust the values to the target gas.
2. Select ***Next***
3. Supply target gas:

Option	Description
Test gas cylinder	Set the pressure reducer to a flow rate of 500 mL/min.
Test gas ampoule	Break the test-gas ampoule in the calibration flask.
Gas bag	Fill the gas bag using the test gas cylinder. Connect hose leading to the pump module with gas bag.
Test gas cylinder and flowmeter	Slowly open the pressure reducer of the test gas cylinder until the flowmeter indicates a flow.

4. Select ***Next***.
   ⇒ The current value and the gassing time are displayed.
5. When the displayed measured value has stabilised (max. wait time = 3 minutes), perform the calibration.
   a. Select ***calibrate***.
      ⇒ The target value, the current value and the sensor vitality (bar diagram) are displayed.
   b. Select ***Accept value***.
   c. End the target gas supply.
      ⇒ The calibration interval and the date for the next calibration are displayed.
   d. Select ***Back to menu***.

6.5 Performing automatic calibration

Automatic calibration involves zero adjustment and span calibration in a combined process. Automatic calibration can be used alternatively instead of separate zero adjustment and span calibration.

Requirements:
– The automatic calibration function is activated (see section 11.2).
– The warm-up phase of the sensor is completed (see section 5.5).
– Test gas supply is prepared (see section 6.2).

Procedure, using an EC-O_2 sensor as an example

ℹ The process of automatic calibration for EC-O_2 sensors is shorter.

1. Select ***Calibration*** > ***Auto calibration***.
   ⇒ The 4-20 mA interface issues the maintenance signal.
   ⇒ "***Fresh air cal. is running!***" is displayed.
   Instead of performing zero adjustment, the zero-point value is checked. After that, the sensitivity is calibrated.
   ⇒ If the automatic calibration was successful, the message "***EC-O_2: ok***" is displayed.
2. Select ***Back to menu***.

Procedure, using an EC-H_2S sensor as an example

1. Select ***Calibration*** > ***Auto calibration***.
   ⇒ The 4-20 mA interface issues the maintenance signal.
   ⇒ The zero-point is adjusted. "***Fresh air cal. is running!***" is displayed.
   If the zero adjustment was successful, span calibration is performed.
   ⇒ The values for the span calibration using the target are displayed.
   Example:
   "***Cal.gas : H_2S***
   Cal.unit : ppm
   Concentr.: 000025"
   If the displayed values do not match the target used, use the control keys to adjust the values to the target gas.
2. Supply target gas.

Option	Description
Test gas cylinder	Set the pressure reducer to a flow rate of 500 mL/min.
Test gas ampoule	Break the test-gas ampoule in the calibration flask.
Gas bag	Fill the gas bag using the test gas cylinder. Connect hose leading to the pump module with gas bag.
Test gas cylinder and flowmeter	Slowly open the pressure reducer of the test gas cylinder until the flowmeter indicates a flow.

3. Select ***Next***.
   ⇒ The current measured value and the gassing time are displayed.
4. Wait until the measured value has stabilised. When the displayed measured value has stabilised (max. wait time = 3 minutes), select ***calibrate***.

   ℹ With some sensors, the gas detector recognises by itself if the measured value has stabilised. If one of this sensors is installed, the gas detector starts the calibration automatically, without the need to select ***calibrate*** manually.

   ⇒ The target value and the current value are displayed.
5. End the target gas supply.

6. When the current value is equal to the target value, select ***Accept value***.

7 Troubleshooting

If the display is without function, have the gas detector checked by Dräger.

The fault or warning numbers listed below are displayed in the menu (see section 4.4.4).

7.1 Fault

Number	Cause	Remedy
# 1	Serious data error in the measurement module – various causes.	Reset the measurement module to the factory settings (see section 9.8). If the error persists, have the gas detector checked by DrägerService.
# 2	Serious device error – various causes.	Have the gas detector checked by DrägerService.
# 61	Data error on the interface card – various causes	Have the gas detector checked by DrägerService.
# 63	Hardware or software fault in the pump module.	Replace the pump module.
# 64	Flow rate of the pump module undershoots the error threshold. Reliable measurements are no longer possible.	Check hoses for blockages, re-adjust the flow rate, if necessary.
# 65	3-wire cable interrupted.	Check connections
# 67	Relay module not contacted correctly.	Check the connector of the relay module or re-plug.
# 100	Measurement module cannot detect a sensor.	Remove and re-install the sensor (see section 5.2). If the error persists, check the sensor connector or replace the sensor.
# 101	Sensor data error in the gas detector.	Remove the sensor and install it again. If the error persists, have the gas detector checked by DrägerService.
# 102	Gas detector does not support the sensor version.	Use a compatible sensor as per spare parts list.
# 103	Sensor data error in the gas detector.	Reset the sensor to the factory settings (see section 11.6). If the error persists, have the gas detector checked by DrägerService.
# 106	Zero adjustment failed	Perform zero adjustment again (see section 6.3).
# 107	Span calibration failed	Perform span calibration again (see section 6.4).
# 108	Sensor data error	Replace the sensor.

Number	Cause	Remedy
# 109	Device error	Check sensor contacts, otherwise have the gas detector checked by DrägerService.
# 121	Fresh air calibration failed (1st step of automatic calibration)	Perform automatic calibration again (see section 6.5), making sure that the ambient air is free from foreign gas.
# 125	Sensor not ready for operation.	Replace the sensor.
# 129	Sensor electrolyte has evaporated.	Replenish sensor electrolyte.
# 130	Sensor lock is switched on. A sensor with a different part number than previously configured is installed.	Switch off the sensor lock (see section 11.4) or use a new sensor with the same part number.
# 134	Contact between sensor and measurement module is faulty.	Check sensor contacts. Remove and re-install the sensor several times. If the error persists, replace the sensor.
# 136	Sensor hardware fault.	Remove and re-install the sensor. If the error persists, replace the sensor.

7.2 Warnings

Number	Cause	Remedy
# 1	Data error in the gas detector – various functions (e.g. for data storage) can be impaired.	Reset the gas detector to the factory settings (see section 9.8). If the error persists, have the gas detector checked by DrägerService.
# 51	Data logger in hold mode (Stack) is filled to 100 %. It is no longer recording data.	Read out the data, clear and restart the data logger (see section 12).
# 52	Data logger in hold mode (Stack) is filled to 90 %.	Read out the data as soon as possible, then clear and restart the data logger.
# 53	No valid date or time is set.	Set time and date (see section 9.4).
# 58	Dongle was removed without having been deactivated.	Deactivate Dongle prior to removing (see section 9.9).
	Hardware fault of a dongle.	Replace the dongle.
# 59	The pump is worn	Replace the pump module.
# 64	Flow rate of the pump module undershoots the warning threshold. Reliable measurements will soon no longer be possible.	Check hose for blockage, re-adjust the flow rate, if necessary.

Number	Cause	Remedy
# 106	Zero deviation too high.	Perform zero adjustment (see section 6.3).
# 111	Sensor not operated in the specified temperature range.	Operate sensor in the specified temperature range.
# 112	Sensor near end of life.	Replace the sensor (see section 8.2).
# 114	Calibration interval expired.	Calibrate the sensor again (see section 6).
# 115	The sensor was exposed to an excessively high gas concentration for a long period.	Reduce excessive gassing.
# 119	The sensor is not yet fully warmed up. Measuring errors can occur.	Wait until the sensor has fully warmed up.
# 120	The sensor was exposed to an excessively high gas concentration for a long period.	Reduce excessive gassing. If the problem persists, replace the sensor (see section 8.2).
# 131	The sensor will soon no longer be ready for operation.	Replace the sensor (see section 8.2).
# 132	Sensor electrolyte has evaporated. Measurements will soon no longer be possible.	Replenish sensor electrolyte.
# 135	Information, e.g. the part number or the serial number, is not available.	Disconnect the gas detector from the mains and restart it. If the error persists, have the gas detector checked by DrägerService.

8 Maintenance

8.1 Preparing a maintenance plan

The gas detector must be serviced at regular intervals. The intervals and activities are defined in the maintenance plan by the person who is responsible for the gas detection system.

The maintenance interval recommended by Dräger is 6 months.

Dräger recommends the following activities:

- Perform tests:
  - Check signal transmission to the controller (see section 10.2.9).
  - Test the alarm relay and the fault relay (only with relay module, see section 9.2.6).
  - Checking the display for proper functioning 4.1.5
- Service the sensor (e.g. replace the selective filter).
- Calibrate the sensor (see section 6 Calibration).

– If a pump module is used:
  – Check the aspiration path for tightness.
  – Compare the flow rate at the aspiration location and downstream of the gas detector.
– Carry out inspection at regular intervals in accordance with applicable national regulations (e.g. EN 60079-29-2, EN 45544-4, T021/T023).

8.2 Replacing the sensor

ℹ Even in explosion-hazard areas, the sensor can be replaced without interruption of the supply voltage.

1. If a sensor of a different type is installed, it may be necessary to switch off the sensor lock (see section 11.4).
2. Activate the sensor replacement function (see section 11.1). Otherwise a fault signal will be issued when the sensor is pulled off.
3. Loosen the hexagon socket screw at the bayonet ring.
4. Unscrew the bayonet ring from the gas detector.
5. Remove the old sensor.
6. With the Dräger logo pointing forward, insert the sensor into the sensor opening.
7. Screw the bayonet ring back on.
8. Tighten the hexagon socket screw at the bayonet ring.

9 Device settings

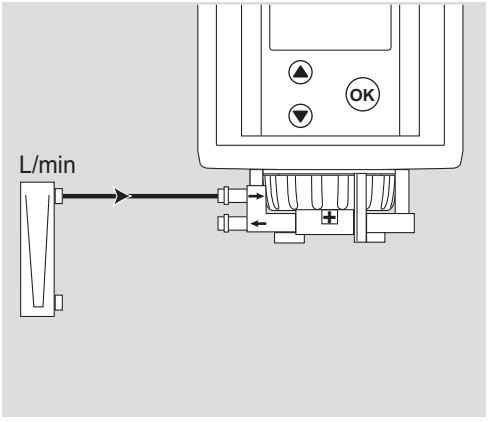
9.1 Pump (only with pump module)

9.1.1 Adjusting the pump output

Equipment:
– Pump adapter (order no. 8320900)
– flowmeter

1. Select ***Settings*** > ***Instrument*** > ***Pump*** > ***Pump flow***.
   ⇒ The 4-20 mA interface issues the maintenance signal.
   ⇒ "***Flowalarm woud be disabled***. ***Please usea Flowmeter***." is displayed.
   ⇒ If a relay module is installed, the fault relay is energised.

2. Connect pump adapter and flowmeter.



29808

3. Select ***Next***.
4. Adjust the pump output setting and check at the flowmeter. For a short response time select a high pump throughput rate.
5. Select ***Next***.

   ⇒ The flow thresholds are displayed.
   Flow threshold for error: 0.3 L/min
   Flow threshold for notice: 0.4 L/min

9.1.2 Displaying the pump runtime

– Select ***Settings*** > ***Instrument*** > ***Pump*** > ***Operating time***.

9.2 Alarms (only with relay module)

9.2.1 Switching the alarm on or off

1. Select ***Settings*** > ***Instrument*** > ***Alarm*** > ***Alarm on/off***.

enable	Alarm relay is switched on.
disable	Alarm relay is switched off. No alarm is reported via the alarm relays and the HART interface. The fault relay is energised to display the status of the disabled alarm relays. The display shows a warning symbol ⚠.

2. Select ***Enable*** or ***Disable***.

9.2.2 Configuring the relay

1. Select ***Settings*** > ***Instrument*** > ***Alarm*** > ***Relay settings***.
2. Make the settings.

Normally energized	In normal state (no alarm), a current flows through the coil of the relay (fail-safe).
Alarm energized	The coil of the relay is flowed through by current in alarm state.

9.2.3 Overview of alarm settings

Alarm condition met

Alarm configuration		Acknowledge key operated	Acknowledge key not operated
Latching	***Acknowledging***	Alarm disabled	Alarm enabled
	Non Acknowledging	Alarm enabled	Alarm enabled
Non Latching	***Acknowledging***	Alarm disabled	Alarm enabled
	Non Acknowledging	Alarm enabled	Alarm enabled

Alarm condition ceases

Alarm configuration		Acknowledge key operated	Acknowledge key not operated
Latching	***Acknowledging***	Alarm disabled	Alarm enabled
	Non Acknowledging	Alarm disabled	Alarm enabled
Non Latching	***Acknowledging***	Alarm is disabled	Alarm is automatically disabled if the alarm condition ceases
	Non Acknowledging	Alarm is automatically disabled if the alarm condition ceases	Alarm is automatically disabled if the alarm condition ceases

9.2.4 Configuring alarms

1. Select ***Settings*** > ***Instrument*** > ***Alarm*** > ***Cfg. Alarm A1*** or ***Cfg. Alarm A2***.
2. Make the settings. Use ***Next*** to call up the steps in turn.
   a. Set the value for the alarm threshold.
   Min./max. Alarm thresholds are dependent on the sensor.
   Alarm thresholds for O_2 sensors can be set anywhere between 0.1 vol% and 25 vol%.
   b. Set the alarm direction.

Rising	An alarm is issued if the measured value is above the alarm threshold.
Falling	An alarm is issued if the measured value is below the alarm threshold.

   c. Set the latch mode.
   If the gas detector is used to detect oxygen, Alarm A1 and Alarm A2 must be configured as latching. If both alarm thresholds have the same direction (activation when the oxygen concentration is increasing or decreasing), the first alarm may be configured as ***Non Latching***.

Latching	Alarm relays do not change their state automatically when the alarm condition ceases. Alarm must be acknowledged manually.
Non Latching	Alarm relays change their state when the alarm condition ceases. Alarm does not need to be acknowledged manually. The gas detector is no longer in alarm state.

d. Set the alarm acknowledge mode. For safety-relevant switching actions, configure the alarm as ***Non Acknowledging***.

Acknowledging	Alarm relays can be acknowledged although an alarm is active.
Non Acknowledging	Alarm relays can only be acknowledged when the alarm is no longer active.

e. Set the hysteresis value.
This feature prevents the relay from being energised and deenergised in rapid sequence.
Example: The alarm threshold was set to 40 ppm and the hysteresis to 3 ppm. The alarm remains active until the measured value has fallen below 37 ppm.

f. At the overview of the settings made, select ***Confirm***.

9.2.5 Switching alarm acknowledgement on or off at the gas detector

Enables/disables the possibility to acknowledge alarms at the gas detector by pressing OK.

When this function is switched off and the alarm is configured as latching, an alarm can only be acknowledged by a voltage interruption to the gas detector.

1. Select ***Settings*** > ***Instrument*** > ***Alarm*** > ***Acknowledge mode***.
2. Select ***Enable*** or ***Disable***.

9.2.6 Testing the alarm relay and the fault relay

During the relay test, an error state is simulated and the corresponding relay is energised.

1. Select ***Settings*** > ***Instrument*** > ***Alarm*** and the desired signal condition.

Set Alarm A1	Simulate pre-alarm (alarm 1).
Set Alarm A2	Simulate main-alarm (alarm 2).
Set Fault	Simulate fault signal.

2. Select ***Enable*** or ***Disable***.

9.3 Setting passwords

1. Select ***Settings*** > ***Instrument*** > ***Passwords*** and the password to be changed.
2. Set the password.

9.4 Setting date and time

1. Select ***Settings*** > ***Instrument*** > ***Date and time***.
2. Select the line for date or time.
3. Make the settings.

9.5 Setting the time format

1. Select ***Settings*** > ***Instrument*** > ***Time format***.
2. Select the line for the time format of date or time.
3. Select the time format (European or American).

9.6 Setting the language

1. Select ***Settings*** > ***Instrument*** > ***Language***.
2. Select the language.

9.7 Configuring the function key

1. Select ***Settings*** > ***Instrument*** > ***Function key***.
2. Select the function to be called.

Show graph[1)]	Displays the measured values of the sensor graphically on a time axis.
Show Fault	Shows existing errors.
Show Notice	Shows existing warnings.
Show Fault Codes	Shows fault codes for existing errors.
Sensor Vitality[2)]	Shows the sensor vitality.

1) Only works with the data dongle
2) Only works with the diagnostic dongle

9.8 Resetting the measurement module to the factory settings

All configurable parameters are reset.

1. Select ***Settings*** > ***Instrument*** > ***instrument***.
2. Select ***Confirm***.

9.9 Deactivating dongles

In the event of an error or prior to removing, this function can be used to deactivate dongles. Dongles are re-activated by switching the gas detector off and back on again.

1. Select ***Settings*** > ***Instrument*** > ***SW Dongle*** and the dongle to be deactivated.
2. Select ***Fkt. deactive***.
   ⇒ The desired dongle is deactivated.

10 Communication settings

10.1 HART interface

10.1.1 Setting the polling address

The polling address configures the gas detector for analogue operation or for Multidrop operation.

HART command: #6 (Write Polling Adress)

1. Select ***Settings*** > ***Communication*** > ***Hart interface*** > ***Polling address***.
2. Set the polling address and select ***Confirm***.

0	Selects analogue operation
1 to 15	Selects Multidrop operation The 4-20 mA interface is deactivated and set to a constant current of approx. 3 mA.

ℹ Configure all devices of one line with different polling addresses. It is advisable to use a sequence starting with 1.

10.1.2 Displaying the unique identifier

The unique identifier (unique HART address) must be known for nearly all HART commands for addressing.

HART commands:

– #0 (Read Unique Identifier)
– #11 (Read Unique Identifier associated with Tag)

1. Select ***Settings*** > ***Communication*** > ***Hart interface*** > ***Unique identifier***.
2. The unique identifier is displayed.

10.1.3 Setting the HART tag

The HART tag (session ID designation) is used to identify a session ID.

1. Select ***Settings*** > ***Communication*** > ***Hart interface*** > ***Tag***.
2. Set the HART tag and select ***Confirm***. The HART tag can consist of up to 8 alphanumeric characters.

10.2 4-20 mA interface

10.2.1 Setting the full scale value

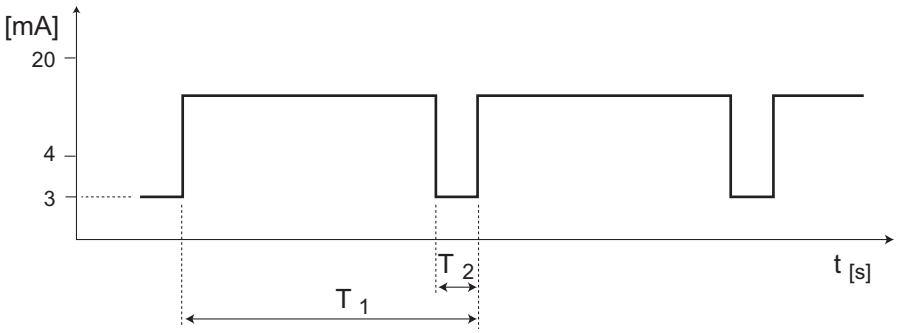
The full scale value is equal to the measured value at which 20 mA are output. The standard full scale value of the sensor is used as default.

ℹ For information about the settings range for the full scale value refer to the instructions for use for the sensor used. For DrägerSensor O_2 and O_2LS see section 14.3.

1. Select ***Settings*** > ***Communication*** > ***Analog interface*** > ***Analog setpoint***.
2. Set the full scale value and select ***Confirm***.

10.2.2 Information about the warning signal

In the event of a warning signal a warning level is issued on the 4-20-mA interface for the T2 interval. For the remainder of the time of T1, the measured signal is transmitted.



10.2.3 Switching the warning signal on/off

1. Select ***Settings*** > ***Communication*** > ***Analog interface*** > ***Warning on/off***.
2. Select ***Enable*** or ***Disable***.

10.2.4 Setting the warning interval

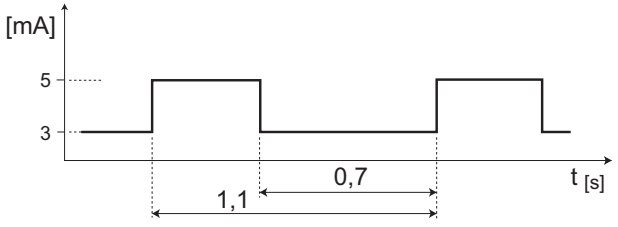
1. Select ***Settings*** > ***Communication*** > ***Analog interface*** > ***Warning interval***.
2. Set the times for warning intervals T1 and T2 and select ***bestätigen***.

10.2.5 Setting the electric current value of the warning signal

1. Select ***Settings*** > ***Communication*** > ***Analog interface*** > ***Warning value***.
2. Set the electric current value and select ***Confirm***.

10.2.6 Setting the signal type of the maintenance signal

1. Select ***Settings*** > ***Communication*** > ***Analog interface*** > ***Maint. signal***.
2. Select the signal type.

static	A constant current signal is issued. The electric current can be configured.
dynamic	An alternating signal of 3 and 5 mA with a frequency of approx. 1 Hz is issued. 

10.2.7 Adjusting the electric current of the static maintenance signal

The electric current can only be adjusted if the maintenance signal is set to static. Otherwise the function is not available.

1. Select ***Settings*** > ***Communication*** > ***Analog interface*** > ***Maint. value***.
2. Set the electric current value and select ***Confirm***.

10.2.8 Adjusting the zero shift of the 4-20 mA signal

The 4 mA zero-point of the 4-20 mA signal can be shifted by a correction value of ± 0.5 mA.

1. Select ***Settings*** > ***Communication*** > ***Analog interface*** > ***Offset current***.
2. Set the correction value and select ***Confirm***.

10.2.9 Testing the 4-20 mA interface

For testing of the 4-20 mA interface it is possible to issue different currents as test signals simulating different states.

ℹ These functions can be used to trigger alarms in the control unit. If necessary, deactivate the alarms in the control unit first.

- To turn on a test signal, select ***Settings*** > ***Communication*** > ***Analog interface*** and the desired test.
- To turn off the test signal select the corresponding option for each test.

10.3 LON interface

10.3.1 Displaying the Neuron ID

The neuron chip is the core piece of the fieldbus component. Each neuron chip has its own neuron ID by which the gas detector is recognised on the LON network.

- Select ***Settings*** > ***Communication*** > ***LON*** > ***Show Neuron ID***.

10.3.2 Sending the service PIN

The service PIN is a special connector of the neuron chip. The gas detector can be commissioned by sending its Neuron ID to the LON network by means of the Service Pin function.

1. Select ***Settings*** > ***Communication*** > ***LON*** > ***Service-Pin***.
2. Select ***Confirm***.
   ⇒ The Neuron ID is sent.

10.4 Configuring the address for the Profibus PA-/ Foundation Fieldbus interface

1. Select ***Settings*** > ***Communication*** > ***PA/FF interface*** > ***PA Address***.
2. Enter the address (settings range 001 to 126).

11 Sensor settings

11.1 Activating the sensor replacement function

Activating this function suppresses the fault signal when the sensor is removed, and all sensor data are stored.

- Select ***Settings*** > ***Sensor*** > ***Sensor replacem.***.
  ⇒ The 4-20 mA interface issues the maintenance signal.
  ⇒ "***Please remove sensor***" is displayed.

  If no entries are made, the gas detector automatically switches over to fault mode after 15 minutes.

The maintenance signal remains active until the new sensor has been installed.

11.2 Enabling/disabling the automatic calibration function

When the automatic sensor calibration function is disabled, the function cannot be selected in the menu.

1. Select ***Settings*** > ***Sensor*** > ***Set Autocal.***.
2. Select ***Enable*** or ***Disable***.

Enable	Function is enabled.
Disable	Function is disabled.

11.3 Sensor test (only with sensor-test dongle or with diagnostic dongle)

11.3.1 Turning the sensor self-text on/off

With the sensor self-test, the gas detector continuously tests the sensor. If the sensor is not working correctly, the gas detector issues a corresponding warning or an error.

1. Select ***Settings*** > ***Sensor*** > ***Sensortest*** > ***Set sensortest***.
2. Select ***Enable*** or ***Disable***.

11.3.2 Performing the sensor self-test manually

1. Select ***Settings*** > ***Sensor*** and the menu item for the sensor used. Select ***Sensor selftest***.
2. If a sensor self-test is available (depending on the sensor used and on the device status), select ***Start Sensortest***.
3. Select ***Confirm***.
   ⇒ The result is displayed after a few seconds.

11.4 Turning the sensor lock on/off

1. Select ***Settings*** > ***Sensor*** and the menu item for the sensor used. Select ***Sensorlock***.

2. Select ***Enable*** or ***Disable***.

Enable	The measurement module will accept a new sensor only if its part number, and hence the sensor type, is the same as for the old sensor.
Disable	The measurement module also accepts other sensor types and adopts the default setting of the new sensor. In this case, the configuration of the measurement module is changed.

11.5 Editing the measured gas settings

1. Select ***Settings*** > ***Sensor*** and the menu item for the sensor used. Select ***Gas-Cfg***.
2. First select the measured gas and then the unit of measurement.
   ⇒ An overview of the settings is displayed.
3. Select ***Confirm***.

11.6 Resetting the sensor to the factory settings

1. Select ***Settings*** > ***Sensor*** and the menu item for the sensor used. Select ***basic init Ch***.
2. Select ***Confirm***.
   ⇒ The sensor is reset.

11.7 Adjusting the calibration interval

The calibration interval setting is used by the device to determine the time for the next calibration.
Calibration intervals are sensor specific. See sensor data sheet for pre-set calibration intervals and settings ranges.

1. Select ***Settings*** > ***Sensor*** and the menu item for the sensor used. Select ***Cal. Intervall***.
2. Set the number of days for the calibration interval.
3. Select ***Confirm***.

12 Data storage setting (only with the data dongle)

The data logger comprises a measured value logger and an event logger.

The measured value logger can only be evaluated with the GasVision PC software (Version 5.5 or higher).

12.1 Information about the measured value logger

The measured value logger can save at least 3000 measured values. If the sample time is set to 1 minute, the monitoring period runs to approx. 50 hours. The monitoring period can be significantly extended if the trigger mode is turned on.

12.2 Information about the event logger

The event logger stores device and sensor events (e.g. overshooting of the A1 threshold value, pump flow faults, etc.). The event logger can save 100 events.

12.3 Turning the data logger on/off

1. Select ***Settings*** > ***Datalogger*** > ***Datalogr. on/off***.
2. Select ***Enable*** or ***Disable***.

12.4 Setting the sample time

1. Select ***Settings*** > ***Datalogger*** > ***Cfg Datalogger*** > ***Sample Time***.
2. Select a sample time.

12.5 Setting the evaluation mode

The evaluation mode defines whether peak values or average values are stored for the configured sample time.

1. Select ***Settings*** > ***Datalogger*** > ***Cfg Datalogger*** > ***Peak/Average***.
2. Select an evaluation mode.

Peak	Depending on the measured gas, the maximum or (for O_2) minimum concentration value measured during the selected sample time is stored.
Average	The average value of all concentration values measured during the selected sample time is stored.

12.6 Switching trigger mode on/off

With the help of the trigger mode it is possible to store measured values only from a pre-defined trigger value upward.

1. Select ***Settings*** > ***Datalogger*** > ***Cfg Datalogger*** > ***Trigger on/off***.
2. Select an option.

Enable	Measured values are stored only if the measured values (with respect to the last-stored value) are greater than the configured trigger value.
Disable	All measured values are stored during the selected sample time.

12.7 Setting the trigger value

The trigger value is the threshold value from which the measured values are stored if the trigger is on. It is expressed as a percentage of the full scale value.

Example: The full scale value is 500 ppm, and a trigger value of 2 % is entered. The data logger will then only store measured values that deviate from the last stored measured value by 10 ppm.

1. Select ***Settings*** > ***Datalogger*** > ***Cfg Datalogger*** > ***Trigger value***.

2. Enter a value and select ***Confirm***.

12.8 Setting the buffer mode

1. Select ***Settings*** > ***Datalogger*** > ***Cfg Datalogger*** > ***Stack/Roll***.
2. Select an option.

Roll (Roll)	When the storage space of the data logger is used up, the oldest data will be overwritten first.
Stack (Stack)	When the storage space of the data logger is used up it will no longer be possible to store data. An appropriate warning is issued.

12.9 Deleting data from the data logger

1. Select ***Settings*** > ***Datalogger***.
2. Select an option.

Clear Datalogger	Delete measured values.
Clear Eventlogr.	Delete event data.

13 Disposal

This product must not be disposed of as household waste. This is indicated by the adjacent symbol.
You can return this product to Dräger free of charge. For information please contact the national marketing organizations or Dräger.

14 Technical data

Measuring range and metrological properties depend on the installed sensor.

Signal transmission to the control unit	
Analogue[1)]	
Measured signal	4 ... 20 mA
Zero-point	4 mA
Full-scale value	20 mA
Sensor drift below zero-point	3.8 ... 4 mA
Over range	20 ... 20.5 mA
Fault signal	<3.2 mA
Fault at the 4-20 mA interface	> 23 mA
Maintenance signal	Static signal: 3.4 mA (factory setting) Range which can be set: 1.0 ... 3.5 mA (3-wire operation) 3.0 ... 3.5 mA (2-wire operation) Dynamic alternating signal: 5 mA for 0.4 seconds and 3 mA for 0.7 seconds

Warning signal	Dynamic alternating signal between measured value and warning level. Range which can be set (warning level): 3.0 ... 3.5 mA (factory setting: < 3.2 mA) Intervals: T1: 2-60 seconds T2: 1-59 seconds and also dependent on T1
Update rate of the 4-20-mA interface	1 second
Digital	HART®-compatible, Transmission via 2 or 3-core shielded cable

1) Factory setting – Depending on the configured current offset, the values can deviate by ±0,05 mA.

ℹ Overshooting or undershooting of the specified supply voltage of the gas detector can lead to faulty indication by the 4 to 20 mA signal.
For applications in compliance with Directive 2014/30/EU, the gas detector should not be operated with a direct current supply grid but with a power supply unit conforming to Protection class II or NEC Class II.

Analogue signal transmission (2-wire)

Supply voltage (without pump or relay module)	
at a current of 3 mA	16.5 ... 30 V DC
at a current of 20 mA	8.0 V DC min.
AC voltage component	< 0.5 V_{SS}

Analogue signal transmission (3-wire)

Supply voltage (without pump or relay module)	12 ... 30 V DC
AC voltage component	< 0.5 V_{SS}
Load	0 Ohms ... 40 [Ohms/Volt] x (U_S[1)] - 4 V)

1) Actual supply voltage on the gas detector

Digital signal transmission (2-wire)

Supply voltage	16.5 ... 30 V DC
AC voltage component	< 0.2 V_{SS}; < 2.2 mV_{eff} (500 ... 10000 Hz)
Load	0 Ohms ... 40 [Ohms/Volt] x (U_S[1)] - 4 V)

1) Actual supply voltage

Digital signal transmission (3-wire)

Supply voltage (without pump or relay module)	12 ... 30 V DC
AC voltage component	< 0.2 V_{SS}
Load	230 Ohms ... 40 [Ohms/Volt] x (U_S[1)] - 4 V), 600 Ohms max.

1) Actual supply voltage

Digital signal transmission (4-wire)	
Supply voltage (without pump or relay module)	12 ... 30 V DC
AC voltage component	< 0.2 Vss
Load	230 Ohms ... 40 [Ohms/Volt] x (Us[1] - 4 V), 600 Ohms max.

1) Actual supply voltage

PROFIBUS® PA	
Communication rate	31.25 kBaud
Data volume	244 Bytes
Bus length	1900 m (6233 ft) max.
Segment size	32 slaves max.
Physical layer	IEC 61158-2; digital, bit-synchronous, Manchester coding
Segment current	18.1 mA

FOUNDATION™ Fieldbus	
Communication rate	31.25 kBaud
Data volume	128 Bytes
Bus length	1900 m (6233 ft) max.
Segment size	240 participants max.
Physical layer	IEC 61158-2; digital, bit-synchronous, Manchester coding
Segment current	18.1 mA

General data	
Protection class (IEC 60529)	IP 66, IP 67 IP 44 (if the relay module is used)
Power consumption[1] (without analogue signal transmission)	< 50 mW
Cable entry	M20 x 1.5; cable diameter 6 mm (0.24") ... 12 mm (0.47")
Cable core cross-section	0.5 mm^2 (AWG 20) ... 2.5 mm^2 (AWG 13)
Weight	approx. 0.9 kg (2.0 lb), without pump and relay module
Life span of the buffer battery for data storage	4 years from delivery

1) To determine the overall power consumption of the gas detector in the case of use of the relay or pump module, add up the individual power consumption values.

Ambient conditions during operation	
Temperature	–40 ... 65 °C (–40 ... 160 °F)[1]
Pressure	700 ... 1300 hPa
Humidity	0 ... 100 % rh, non-condensing

1) The readability of the display is impaired at temperatures below -20 °C (-5 °F) At negative temperatures, the operability of the gas detector is affected be the increasing sluggishness of the display.

Ambient conditions during storage	
Temperature	–40 ... 70 °C (–40 ... 150 °F)
Pressure	700 ... 1300 hPa
Humidity	0 ... 100 % rh, non-condensing

14.1 Relay module

Power supply	
Operational voltage (DC)	12 V to 30 V at the gas detector
Power consumption	<2 W
Relay switch outputs	
logical channels	A1, A2, fault
principle	normally energised (for fail-safe operation)
contacts	1-pole changeover (SPDT)
contact rating	5 A at 30 V DC; 5 A at 250 V AC
temperature resistance of the cables used	at least 20 °C above the ambient temperature occurring during operation.
Overvoltage category	II
Ambient conditions	
Temperature (during operation)	-40 ... 65 °C (-40 ... 160 °F)
Temperature (during storage)	-40 ... 70 °C (-40 ... 150 °F)
Pressure	700 ... 1300 hPa
Humidity	0 ... 100 % rh, non-condensing

14.2 Pump module

Supply voltage (DC)	
for throughput rate 0.5 L/min	12 V to 30 V at the gas detector
for throughput rate 1.0 L/min	16 V to 30 V at the gas detector
for throughput rate 1.5 L/min	20 V to 30 V at the gas detector
Power consumption	
for throughput rate 0.5 L/min	<2 W
for throughput rate 1.0 L/min	<4 W
for throughput rate 1.5 L/min	<6 W
Settings	
Throughput rate	
Settings range	approx. 0.5 L/min to 1.5 L/min (approx. 30 % to 100 %)

Factory setting	0.5 L/min
Warning and alarm	
Flow warning	0.4 L/min
Flow alarm	0.3 L/min
Interior diameter at the tube connection	5 mm
Ambient conditions	
Temperature (during operation)	0 ... 55 °C (32 ... 130 °F)
Temperature (during storage)	-40 ... 70 °C (-40 ... 150 °F)
Pressure	700 ... 1300 hPa
Humidity	0 ... 100 % rh, non-condensing

14.3 Operating conditions with DrägerSensor O_2 and O_2LS

14.3.1 DrägerSensor O_2 (6809720)

The DrägerSensor O_2 (6809720) is an electrochemical two-electrode sensor for the measurement of oxygen (O_2) in the ambient air. The sensor measures the O_2-partial pressure. Changes in pressure have an effect on the measured value in this process. For 1013 hPA without oxygen depletion the sensor measures 20.9 vol% O_2.

Ambient parameters	
Pressure	20.7 to 38.4 in. Hg (700 to 1300 hPa)
Humidity	10 to 95 % rh, non-condensing
Temperature	-5 to +40 °C briefly -20 to +55 °C

Storage	
Pressure	No effect
Humidity	30 to 70 % rh, non-condensing (only relevant if sensor packaging is open)
Temperature	0 to +40 °C
Duration	Storage of sensors is not anticipated. Sensors should be used from the point of arrival. Remaining life span = expected life span - storage period

Effect of ambient parameters		
	Zero-point	**Sensitivity**
Temperature[1)]		
-20 to 55 °C	< ± 0.2 vol% O_2	Relative deviation from display at 20 °C
-10 to 55 °C	-	< ± 8%
-10 to -20 °C	-	< ± 16%

Effect of ambient parameters		
	Zero-point	**Sensitivity**
Pressure	< ±0.2 vol% O_2	Relative deviation from display at 1013 hPa: < 10% of the measured value / 100 hPa
Humidity	No effect	Relative deviation from display at 50 % rh: < 2.5 % of the measured value

1) A calibration at operating temperatures must occur for operating temperature outside the range of -5 °C to 40 °C.

Reaction time[1)]		
	$t_{0...20}$	**$t_{0...90}$**
0 to 25 vol% O_2	≤ 10 seconds	≤ 26 seconds

1) The measured value response time may increase at temperatures below -5 °C.

Stabilisation time: 5 x $t_{0...90}$

Measuring range

0-5 vol% O_2 to 0-100 vol% O_2

Standard: 25 vol% O_2

Minimum display: -1.25 vol% O_2

Warm-up time of the sensor

Operation: < 20 minutes / calibration: ≤ 2 hours

14.3.2 DrägerSensor O_2LS (6809630)

The DrägerSensor O_2LS (6809630) is an electrochemical three-electrode sensor for the measurement of oxygen (O_2) in the ambient air.

Ambient parameters	
Pressure	20.7 to 38.4 in. Hg (700 to 1300 hPa)
Humidity	5 to 95 % rh, non-condensing
Temperature	-40 to +60 °C briefly +65 °C

Storage	
Pressure	No effect
Humidity	30 to 70 % rh, non-condensing (only relevant if sensor packaging is open)
Temperature	0 to +40 °C
Duration	Storage of sensors is not anticipated. Sensors should be used from the point of arrival. Remaining life span = expected life span - storage period

Effect of ambient parameters		
	Zero-point	**Sensitivity**
Temperature		
-40 to 65 °C	< ± 0.3 vol% O_2	< ± 0.3 vol% O_2
Pressure	< ± 0.1 vol% O_2	Relative deviation from display at 1013 hPa: < 2 % of the measured value / 100 hPa
Humidity	No effect	Relative deviation from display at 50 % rh: < 2.5 % of the measured value

ℹ When measuring oxygen in the presence of helium, the “helium compensation” needs to be selected at the sensor.

⚠ CAUTION

Sensor fault

If the sensor is exposed to high concentrations of unsaturated hydrocarbons, alcohol or hydrogen, this can lead to failure of the device.

► Make sure that the sensor is not exposed to such concentrations over a long period.

Reaction time		
	$t_{0...20}$	$t_{0...90}$
0 to 25 vol% O_2	≤ 10 seconds	≤ 30 seconds

Stabilisation time: 5 x $t_{0...90}$

Measuring range

0-5...25 vol% O_2, 0-25 vol% O_2

Standard: 25 vol% O_2

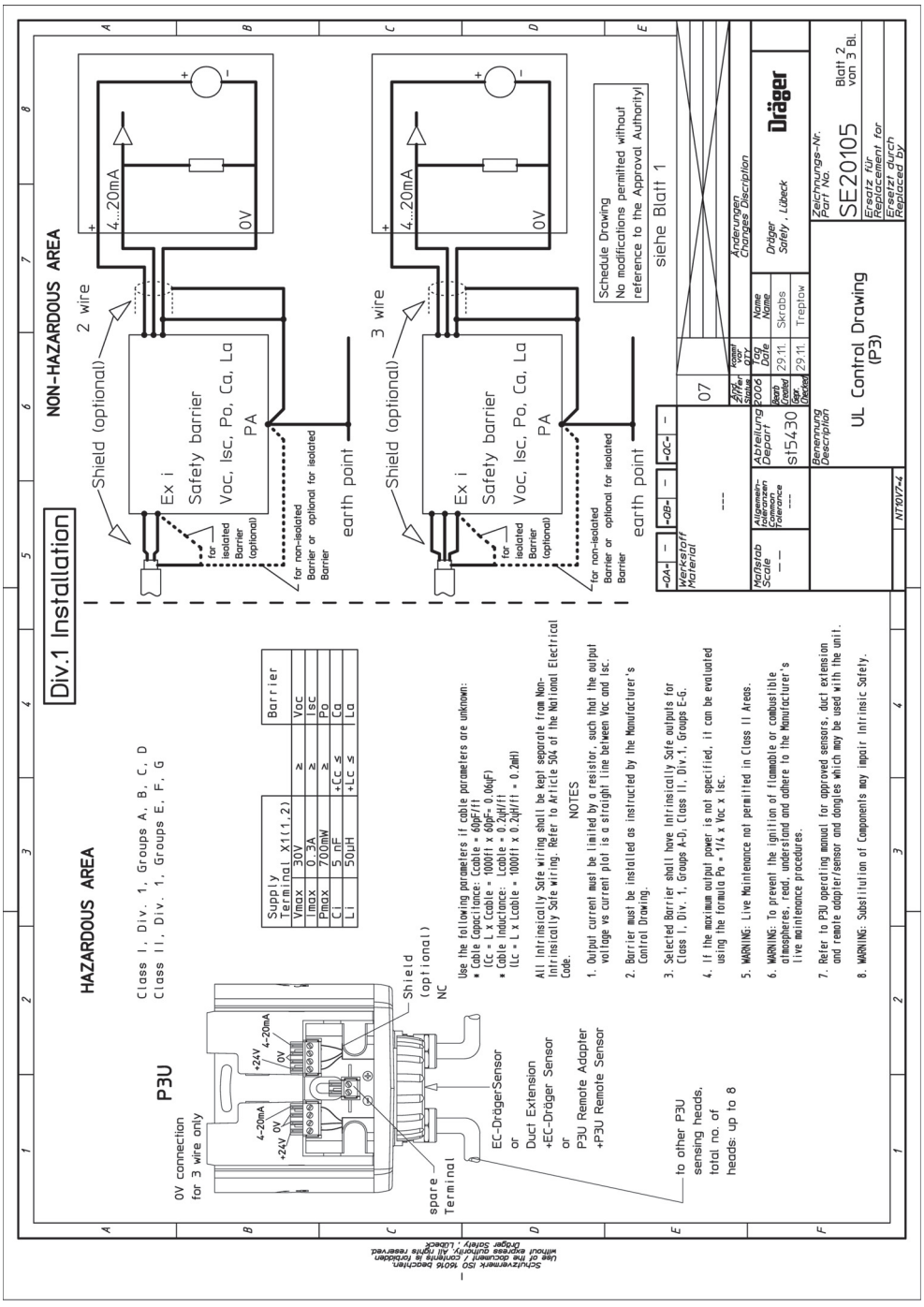
Minimum display: -1.25 vol% O_2

Warm-up time of the sensor

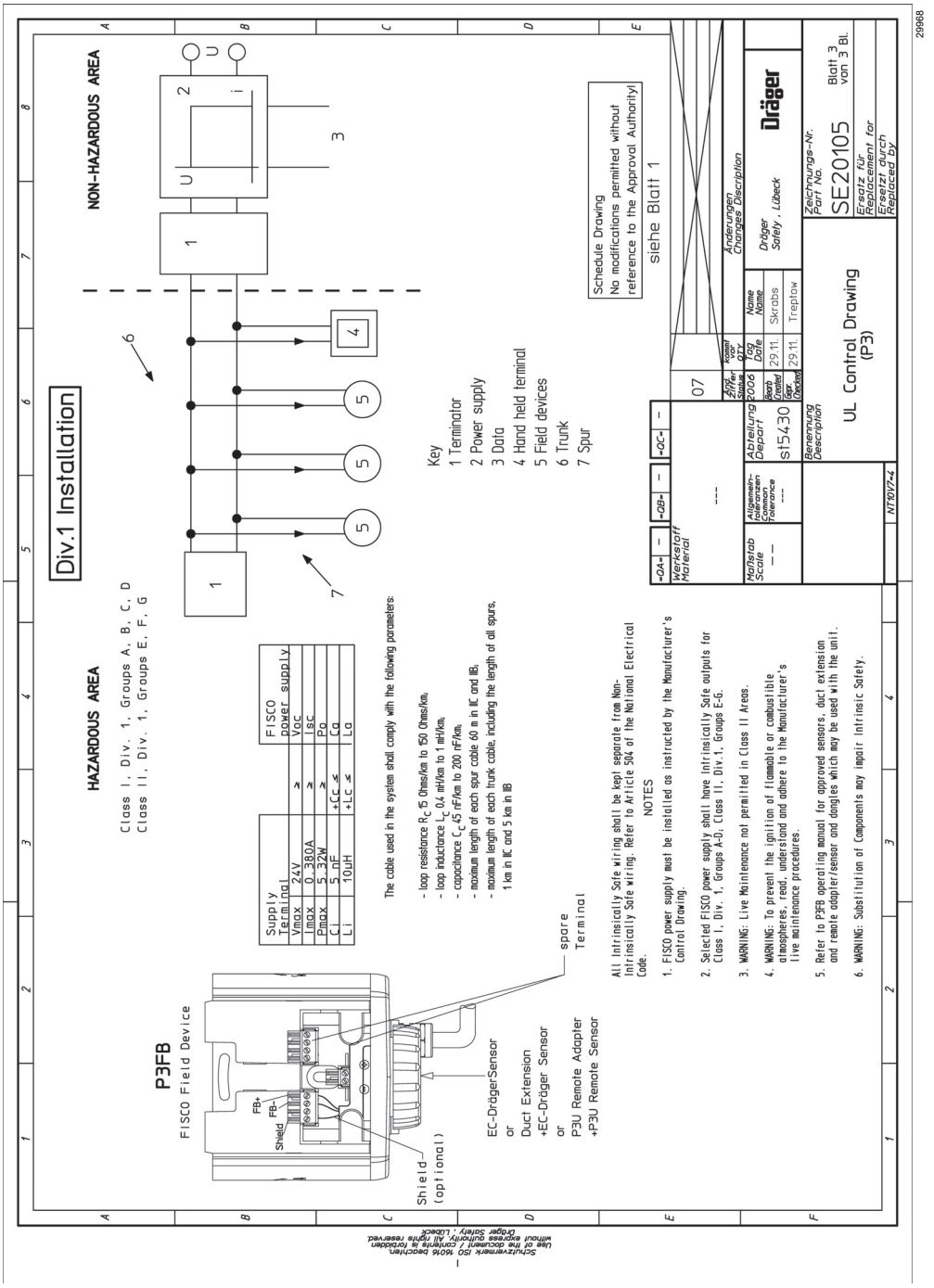
Operation: ≤ 20 minutes / calibration: ≤ 6 hours

15 Annex

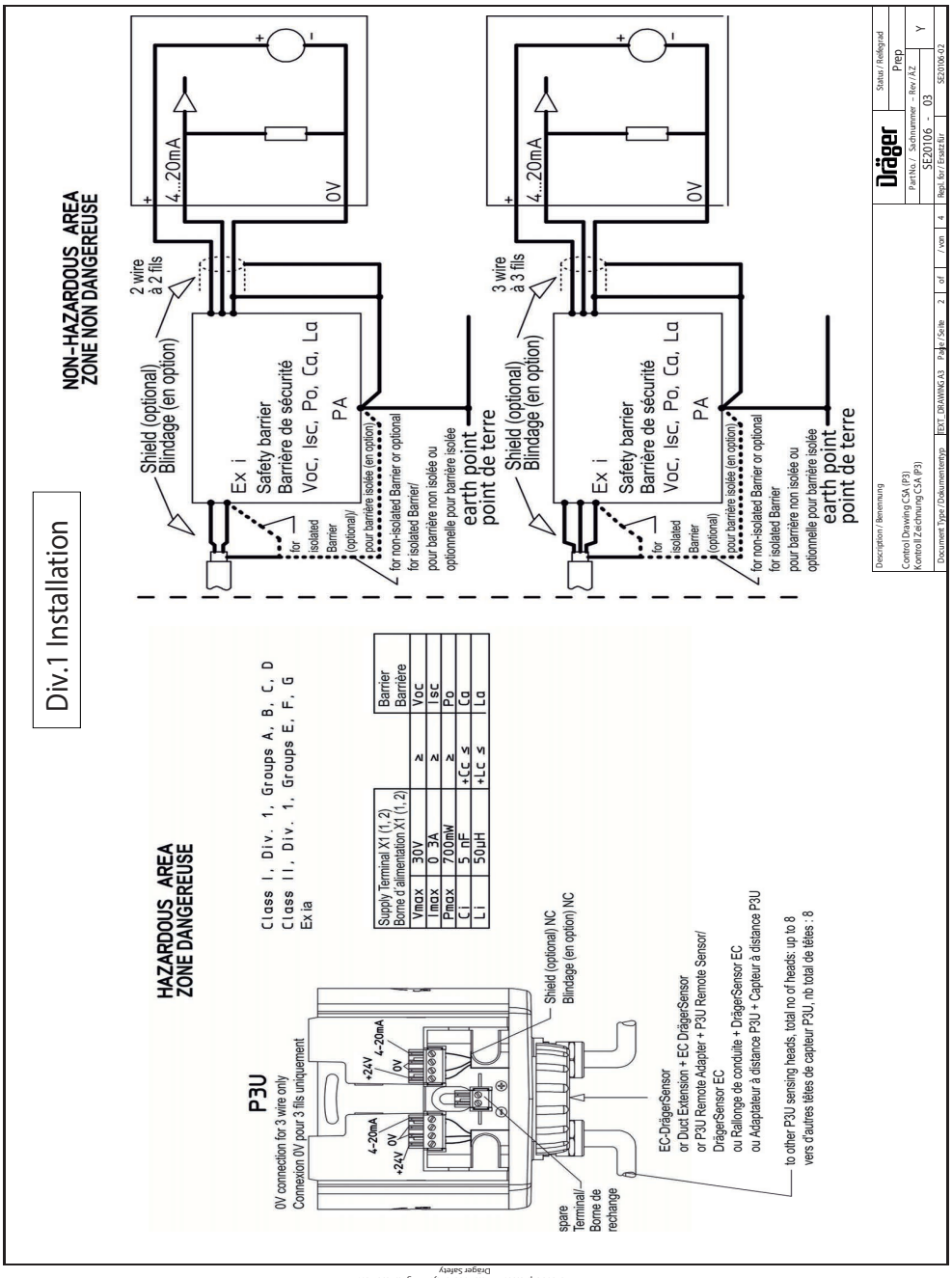
15.1 Control drawing for UL approval[1)]



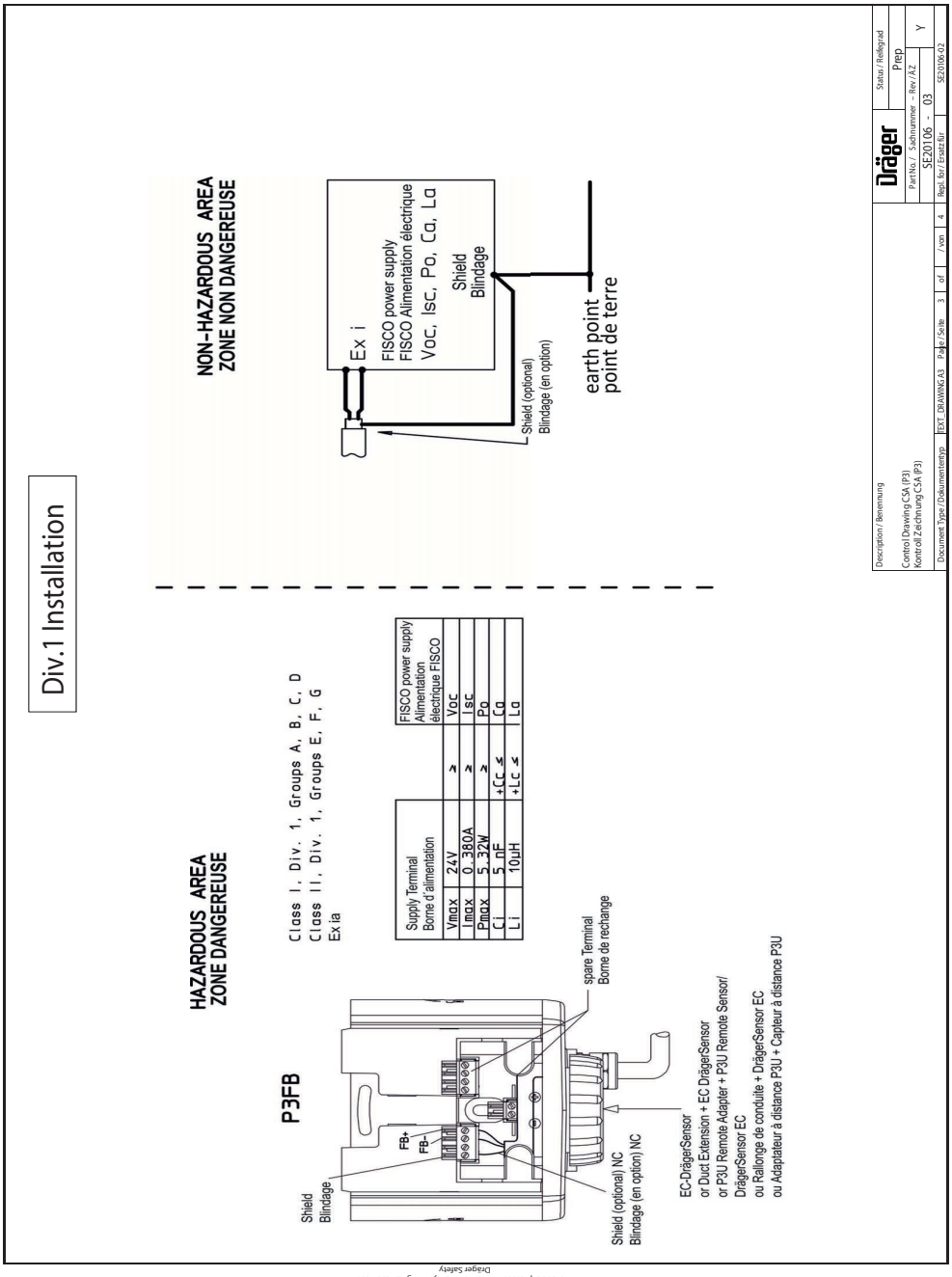
1) Page 1 of the control drawing refers to the Dräger Polytron 3000 and is not pictured.


Div.1 Installation
HAZARDOUS AREA
Class I, Div. 1, Groups A, B, C, D
Class II, Div. 1, Groups E, F, G
NON-HAZARDOUS AREA
P3FB
FISCO Field Device
FB+
FB-
Shield
Shield (optional)
EC-DrägerSensor or Duct Extension +EC-Dräger Sensor or P3U Remote Adapter +P3U Remote Sensor
spare Terminal
Supply Terminal
FISCO power supply
Vmax 24V ≥ Voc
Imax 0.380A ≥ Isc
Pmax 5.32W ≥ Po
Ci 5 nF +Cc ≤ Ca
Li 10uH +Lc ≤ La
The cable used in the system shall comply with the following parameters:
- loop resistance R_C 15 Ohms/km to 150 Ohms/km.
- loop inductance L_C 0.4 mH/km to 1 mH/km.
- capacitance C_C 45 nF/km to 200 nF/km.
- maximum length of each spur cable 60 m in IIC and IIB.
- maximum length of each trunk cable, including the length of all spurs, 1 km in IIC and 5 km in IIB
All Intrinsically Safe wiring shall be kept separate from Non-Intrinsically Safe wiring. Refer to Article 504 of the National Electrical Code.
NOTES
1. FISCO power supply must be installed as instructed by the Manufacturer's Control Drawing.
2. Selected FISCO power supply shall have Intrinsically Safe outputs for Class I, Div. 1, Groups A-D, Class II, Div.1, Groups E-G.
3. WARNING: Live Maintenance not permitted in Class II Areas.
4. WARNING: To prevent the ignition of flammable or combustible atmospheres, read, understand and adhere to the Manufacturer's live maintenance procedures.
5. Refer to P3FB operating manual for approved sensors, duct extension and remote adapter/sensor and dongles which may be used with the unit.
6. WARNING: Substitution of Components may impair Intrinsic Safety.
Key
1 Terminator
2 Power supply
3 Data
4 Hand held terminal
5 Field devices
6 Trunk
7 Spur
Schedule Drawing
No modifications permitted without reference to the Approval Authority!
siehe Blatt 1
Werkstoff Material
Allgemeintoleranzen Common Tolerance
Abteilung Depart
S1543O
Maßstab Scale
Benennung Description
UL Control Drawing (P3)
Änderungen Changes Description
Name
Skrabs
Treplow
Dräger Safety, Lübeck
Dräger
Zeichnungs-Nr. Part No.
SE20105
Blatt 3 von 3 Bl.
Ersatz für Replacement for
Ersetzt durch Replaced by
NT6V7-4
29968

15.2 Control drawing for CSA approval[1)]



1) Page 1 of the control drawing refers to the Dräger Polytron 3000 and is not pictured.



HAZARDOUS AREA/ ZONE DANGEREUSE

Use the following parameters if cable parameters are unknown: Cable Capacitance: Ccable = 60pF/ft (Cc = L x Ccable = 1000ft x 60pF = 0.06µF)
Cable Inductance: Lcable = 0.2µH/ft (Lc = L x Lcable = 1000ft x 0.2µH/ft = 0.2mH)/
Utiliser les paramètres suivants si les paramètres des câbles ne sont pas connus: Capacitance des câbles : Ccable = 60 pF/ft (Cc = L x Ccable = 1000 ft x 60 pF = 0,06 µF)
Inductance des câbles : Lcable = 0,2 µH/ft (Lc = L x Lcable = 1000 ft x 0,2 µH/ft = 0,2 mH)

All Intrinsically Safe wiring shall be kept separate from Non-Intrinsically Safe wiring. Refer to Article 504 of the National Electrical Code./
Tous les câblages à sécurité intrinsèque doivent être tenus à l'écart des câblages qui ne sont pas à sécurité intrinsèque. Se référer à l'article 504 du code électrique national américain.

NOTES/ REMARQUES

P3S/ P3U: **1. Barrier Output current must be limited by a resistor, such that the output voltage vs current plot is a straight line between Voc and Isc./**
Le courant de sortie de la barrière doit être limité par une résistance de manière à ce que la tension de sortie vs le tracé du courant soit une ligne droite entre Voc et Isc.

P3S/ P3U/ P3FB: **2. Barrier / FISCO power supply must be installed as instructed by the Manufacturer's Control Drawing./**
La barrière / Alimentation électrique FISCO doit être installée conformément au dessin de contrôle du fabricant.

P3S/ P3U/ P3FB: **3. Selected Barrier / FISCO power supply shall have Intrinsically Safe outputs for Class I, Div. 1, Groups A-D, Class II, Div. 1, Groups E-G./**
La barrière / Alimentation électrique FISCO sélectionnée doit disposer de sorties à sécurité intrinsèque pour Classe I, Div. 1, Groupes A-D, Classe II, Div. 1, Groupes E-G.

P3S/ P3U: **4. If the maximum output power is not specified, it can be evaluated using the formula Pa = ¼ x Voc x Isc./**
Si la puissance débitée maximum n'est pas spécifiée, elle peut être évaluée en utilisant la formule Pa = ¼ x Voc x Isc.

P3S/ P3U/ P3FB: **5. WARNING: Read and understand manual before operating./**
AVERTISSEMENT: Lire attentivement le manuel avant de mettre en marche.

P3S/ P3U/ P3FB: **6. WARNING: Live Maintenance not permitted in Class II Areas./**
AVERTISSEMENT: La maintenance en direct n'est pas autorisée dans les zones de Classe II.

P3S/ P3U/ P3FB: **7. WARNING: To prevent the ignition of flammable or combustible atmospheres, read, understand and adhere to the Manufacturer's live maintenance procedures./**
AVERTISSEMENT: Pour éviter l'inflammation d'atmosphères inflammables ou combustibles, comprendre et respecter les procédures de maintenance en direct du fabricant.

P3S/ P3U/ P3FB: **8. Refer to P3FB operating manual for approved sensors and duct extension which may be used with the unit./**
Se reporter à la notice d'utilisation P3FB pour savoir quels sont les capteurs homologués et la rallonge de conduite qui peut être utilisée avec l'unité.

P3S: **9. WARNING: Special Tools - MiniGrabber© from Pomona shall be used for connecting meter for calibrations. This MiniGrabber© can only enter the instrument by 4.5 mm and secure that only the test point holes in the circuit board can be accessed from the outside, by using these special tools. Jumper must always be in place, when connecting./**
AVERTISSEMENT: Outils spéciaux - il est recommandé d'utiliser MiniGrabber© de Pomona pour raccorder le compteur à des fins d'étalonnage. Ce MiniGrabber© peut pénétrer de seulement 4,5 mm à l'intérieur de l'instrument et garantit donc, avec ces outils spéciaux, l'accès aux trous de test du circuit électrique depuis l'extérieur. Le cavalier doit toujours être en place lorsque l'on connecte le compteur.

P3S/ P3U/ P3FB: **10. WARNING: Substitution of Components may impair Intrinsic Safety./**
AVERTISSEMENT: La substitution de composants peut compromettre la sécurité intrinsèque.

Description / Benennung	Dräger	Status / Reifegrad
Control Drawing CSA (P3) **Kontroll Zeichnung CSA (P3)**		**Prep**
	Part No. / Sachnummer – Rev / ÄZ	Y
	SE20106 - 03	
Document Type / Dokumententyp: TEXT_DRAWING A3 | Page / Seite: 4 | of / von: 4	Repl. for / Ersatz für: **SE20106-02**	

15.3 Declaration of conformity

51292

CE

EU-Konformitätserklärung
EU-Declaration of Conformity

Dräger

Dokument Nr. / *Document No.* SE20148-11

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

Gasmessgerät Typ P3S (Polytron 3000) / P3U, P3FB (Polytron 7000)
Gas Detection Instrument type P3S (Polytron 3000) / P3U, P3FB (Polytron 7000)

mit der EU-Baumusterprüfbescheinigung / Expertise
is in conformity with the EU-Type Examination Certificate / Expertise **BVS 03 ATEX E 406 X**

ausgestellt von der notifizierten Stelle mit der Kenn-Nr.
issued by the Notified Body with Identification No.
DEKRA Testing and Certification GmbH Handwerkstr. 15 D-70565 Stuttgart 0158

und mit den folgenden Richtlinien unter Anwendung der aufgeführten Normen übereinstimmt
and is in compliance 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*
2014/34/EU	**ATEX-Richtlinie** *ATEX Directive*	EN IEC 60079-0:2018[1], EN 60079-11:2012[1]
2014/30/EU	**EMV-Richtlinie** *EMC Directive*	EN 50270:2015+AC:2016[4] susceptibility: type 2 emission: type 1 EN 61326-1:2013[3] susceptibility: industrial environment emission: group 1, class B
2014/35/EU[2]	**Niederspannungs-Richtlinie** *Low Voltage Directive*	EN 61010-1:2010
2011/65/EU 2015/863/EU	**RoHS-Richtlinie** *RoHS Directive*	EN IEC 63000:2018

[1] nur für explosionsgeschützte Varianten zutreffend / *only applicable for explosion-protected variants*
[2] nur für Varianten mit Relais-Modul zutreffend / *only applicable for variants with relay module*
[3] nur für Varianten mit PROFIBUS, Foundation Fieldbus oder LON / *only applicable for* PROFIBUS, Foundation Fieldbus or LON *variants*
[4] nicht für Varianten mit PROFIBUS, Foundation Fieldbus oder LON / *not applicable for* PROFIBUS, Foundation Fieldbus or LON *variants*

Überwachung der Qualitätssicherung Produktion nach Modul D durch
Surveillance of Quality Assurance Production by (Module D)
DEKRA Testing and Certification GmbH Handwerkstr. 15 D-70565 Stuttgart 0158

Lübeck, 2023-02-14

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

Dr. Marcus Romba
Head of Product Compliance
Safety Products
Research & Development Safety Division

15.4 Information about China RoHS

有毒有害物质名称及含量

36017

部件名称	有害物质					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
组装印刷电路板（主板，SIOS，端口 4-20 mA 或现场总线，HIC）	x	o	x	o	o	o
显示屏	x	o	o	o	o	o

本表格依据 SJ/T 11364 的规定编制。

O: 表示该有害物质在该部件所有均质材料中的含量均在 GB/T 26572 规定的限量要求以下。
X: 表示该有害物质至少在该部件的某一均质材料中的含量超出 GB/T 26572 规定的限量要求。

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