Dräger Polytron 7000

(approved as type P3U and P3FB)
Transmitter for electrochemical Sensors
Instructions for Use

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For Your Safety

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

Maintenance
The unit must be inspected and serviced regularly by suitably qualified persons.
Repair and general overhaul of the apparatus may only be carried out by trained service personnel.
We recommend that a service contract be obtained with DrägerService and that all repairs also be carried out by them.
Only authentic Dräger spare parts may be used for maintenance.
Observe chapter "Maintenance Intervals".

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. The equipment or components may not be modified in any manner. The use of faulty or incomplete parts is forbidden. The appropriate regulations must be observed at all times when carrying out repairs on the equipment or components. If the transmitter has been installed with a suitable safety barrier, its case may be opened or the sensor may be changed while the transmitter is operating.

⚠ CAUTION
When the transmitter is installed in Ex areas Class II, Div. 1 & 2, Group E, F, G the opening of the housing (inclusive sensor replacement) must not be done when connected to power (power must be turned off or the area has to be declassified). Explosion hazard! If the transmitter is equipped, either when delivered or subsequently, with the relay module and/or the pump module, the complete unit is no longer approved for use in explosion-hazard areas. The use of the Dräger Polytron 7000 equipped with a pump module and/or relay module in explosion-hazard areas is forbidden! Explosion hazard! Not suitable for use in oxygen-enriched atmospheres, i.e. oxygen content exceeds 21 vol. %. Explosion hazard! When used in transmitters with pump module, the O2 LS sensor (68 09 630) must always be installed at vibration-free locations. If used in this combination, vibrations may cause the measured value to deviate outside of the permissible range. In applications where category 1G (Zone 0) or EPL Ga devices are required, intense electrostatic charging processes must be avoided.

Accessories
Use only accessories shown in the Ordering List.

Liability for proper function or damage
The liability for the proper function of the apparatus is irrevocably transferred to the owner or operator to the extent that the apparatus is serviced or repaired by personnel not employed or authorized by DrägerService or if the apparatus is used in a manner not conforming to its intended use.
Dräger cannot be held responsible for damage caused by non-compliance with the recommendations given above.
The warranty and liability provisions of the terms of sale and delivery of Dräger are likewise not modified by the recommendations given above.

Dräger Safety AG & Co. KGaA

Intended Use

Dräger Polytron® 7000 Transmitter for electrochemical sensors

— For stationary, continuous monitoring of gas concentrations in ambient air, with built-in DrägerSensor®.

— Automatic configuration of transmitter to suit the built-in DrägerSensor.

— The measuring range may be selected, but it is dependent on the sensor installed.

— With 4 to 20 mA interface, LON communication, Foundation Fieldbus or PROFIBUS PA.

— For installation alternatively in Ex areas zone 0, 1, 2 corresponding to device category 1G, 2G, 3G or Class I, Class II, Div. 1 & 2 hazardous area.
For further details, see the installation notes.

— Optionally compatible with HART® for connection to a suitable control unit.
— Optionally available with pump module for the continuous supply of the gas/air mixture to be tested to the transmitter.

⚠ CAUTION
No explosion protection. Explosion hazard!

® Polytron is a registered trademark of Dräger.
DrägerSensor is a registered trademark of Dräger.
HART is a registered trademark of HCF, Austin, Texas, USA

If used together with a control unit (e. g. Regard without a safety barrier) or equipped with a relay module:

⚠ CAUTION
No explosion protection. Explosion hazard!

— Warning before any hazardous gas concentrations are reached.
— Automatic implementation of counter measures (for example, connection of an additional ventilation).
— Warning for device errors; display of necessary maintenance work.
— Special calibration mode (blocking of alarm triggering, display of calibration mode, one-man calibration).

Detection of oxygen in accordance with EN 50104

⚠ CAUTION
If the Dräger Polytron 7000 transmitter is used for the detection of oxygen, at least one alarm relay must be configured as latching.

Measuring function for the explosion protection

BVS 03 ATEX E 406 X

Dräger Polytron 7000 4 to 20 mA with/without display and keypad with/without relay and pump module in connection with DrägerSensor	Measuring range	Testing standard
O_2 LS (6809630) O_2 (6809720)	0 to 25 Vol.-% O_2	EN 50104 (neutralization measurement)

Measurement of oxygen

PFG No. 41300504

Dräger Polytron 7000 4 to 20 mA with/without display and keypad with/without relay and pump module in connection with DrägerSensor	Measuring range	Testing standard
O_2 LS (6809630) O_2 (6809720)	0 to 25 Vol.-% O_2	EN 50104 (oxygen deficiency and excess of oxygen)

Design

The Dräger Polytron 7000 was developed specifically as a modular system which permits the user to select one of many different configurations.

Dräger Polytron 7000 transmitter with display and keypad and optional for operation with a Palm Pilot 515 and infrared interface or a hand-held HART-compatible operating device or an HART-compatible operating station connected at any point to the 2-wire cable.

This version is suitable for installations where a display of measured value is required on site and where access is easy for the operator.
The transmitter is operated directly via a built-in keypad and display.

Optional extras:

Pump module
This module draws in the gas to be measured from a remote location and pumps it into the Dräger Polytron 7000 transmitter.

⚠ CAUTION
This option is only possible without explosion protection approval. Explosion hazard!

Relay module
This module permits the local switching of actuators, alarm generators, etc. on the basis of the measured gas concentration.

⚠ CAUTION
This option is only possible without explosion protection approval. Explosion hazard! If the Dräger Polytron 7000 transmitter is used in connection with the relay module for detecting oxygen according to EN 50104, the transmitter has to be equipped with software version 8.0 or higher.

Daisy-chain kit
For the connection of several Dräger Polytron 7000 transmitters to one bus line (multidrop installation). This option does not affect the explosion-protection approval of the transmitter.

Duct extension
For mounting the Polytron 7000 transmitters on a duct.
Used to measure the gas concentration in the duct. This option does not affect the explosion-protection approval of the transmitter.

Remote sensor
For installation of the sensor at a distance of up to 30 m away from the Dräger Polytron 7000 transmitter. This option does not affect the explosion-protection approval of the transmitter.

Duct adapter for remote sensor
For mounting a remote sensor on a duct for measuring the gas concentration in the duct. This option does not affect the explosion-protection approval of the transmitter.

Dräger Polytron 7000 software dongles
For activation of additional functions of the Dräger Polytron 7000. This option does not affect the explosion-protection approval of the transmitter.

Installing the transmitter

Preparing for installation

The performance and effectiveness of the entire system depends essentially on the position chosen for installing the transmitter.
The following should be noted during installation:

— Local requirements and regulations governing the installation of gas measuring systems.
— Relevant regulations concerning the connection and routing of electric power supply and signal lines.
— The full scope of environmental factors to which the transmitter may be exposed (ambient conditions: see Technical data, page 87).

— Physical properties of the gas to be measured:
For gases with a density lower than that of air, the transmitter must be located above any possible leak or at the highest point at which large concentrations of gas may occur.
For gases and vapours with a density greater than that of air, the transmitter must be located below a possible leak or at the lowest point at which such gases and vapours may occur.

— The specific uses (e.g. possible leaks, ventilation conditions, etc.).
— Accessibility for the necessary maintenance work (see Installation instructions for the Polytron docking station).
— All other factors and conditions which could have a negative effect on the installation and operation of the system (such as vibrations or varying temperatures).
— We recommend installing a reflective shield if the unit is exposed to strong sunlight.
— The transmitter must be installed vertically (sensor facing downwards).
— The transmitter has been tested with regard to its weather-resistance and may be installed out of doors. Use of a splash guard is recommended to protect the sensor from splashing water, dust and wind.

NOTE
In explosion-hazard areas: Observe the national regulations concerning electrical equipment in explosion-hazard areas.

The Dräger Polytron 7000 transmitter consists of several components:
— Dräger docking station
This can be pre-installed anywhere and contains the electrical installation components.
— The measuring unit Dräger Polytron 7000
contains the electronics of the transmitter.

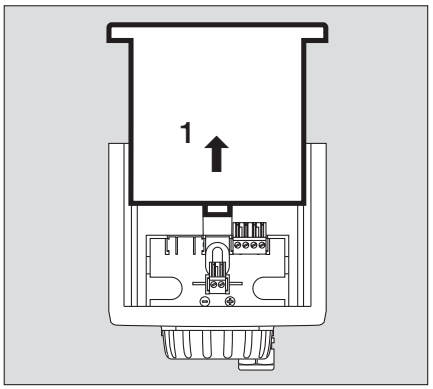
If the measuring unit is not fitted immediately after installing the docking station, the latter should be covered with the raincover provided (dust and water protection) to protect against dust and splashing water.

Installing the docking station

— If the transmitter is to be installed in a Zone 2 explosion-hazard area, select a location with low exposure to mechanical risk.
— Docking station is installed vertically (transmitter with sensor facing down) in an area with low vibrations and stable temperatures – near the possible leak.
— A space of at least 15 cm (6") must be maintained above the transmitter for installation of the measuring unit.
— A space of at least 10 cm (4") – preferably 30 cm (12") – must be maintained below the docking station to permit access for maintenance.

- Unpack the docking station.

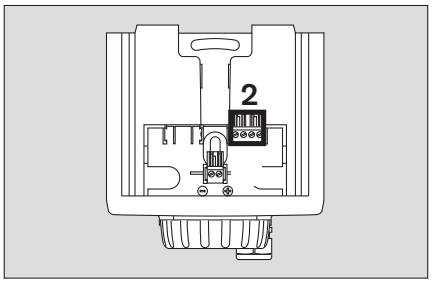
1 Remove raincover (protection against dust and splashing water).



2 Remove the 4-pole terminal block (Part No. 83 16 268), keep it in a safe place and insert it again after completion of the installation work.

- A drilling template is provided on page 137. The mounting holes are 66 ±4mm (2.6 ± 0.16") apart.

⚠ CAUTION
Spacers (e.g. mounting bracket 68 09 951) must be used to prevent any twisting of the housing when installed on uneven surfaces.



If the measuring unit is not to be mounted at this time:

- Refit the raincover (protection against dust and splashing water).

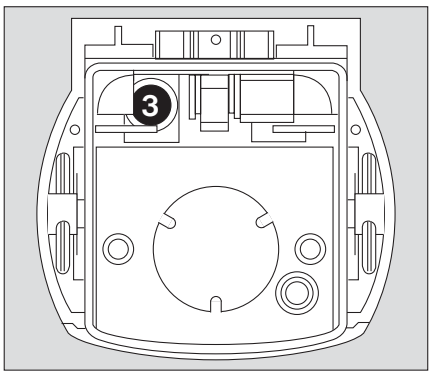
For Multidrop installation only:
(see page 18)

Installing the Daisy Chain kit

Part No. 83 17 282

3 Break or drill out the prepared breakthrough for the second cable gland from the inside of the docking station.
The hole should have a diameter of 20.5 mm.

- Check that the docking station has no loose parts, and clean it if necessary.
- Insert the nut of the cable gland into the docking station.
- Screw in the cable gland from the outside of the docking station and tighten it.



Electrical connections

— The electrical wiring may be laid and connected only by a qualified electrician, who must also comply with the appropriate regulations – a screened or unscreened cable (such as LiY, LiYCY) may be used.

2-wire connection

— Connection to central device with at least 2-wire cable, 0.5 (AWG 20) to 2.5 mm^2 (AWG 13).

Installing the 4 to 20 mA current loop on the transmitter

— For currents of 3 to 22 mA, a DC voltage between 16.5 V DC (3 mA), or 8.0 V DC (22 mA) and 30 V DC must be present at the transmitter.

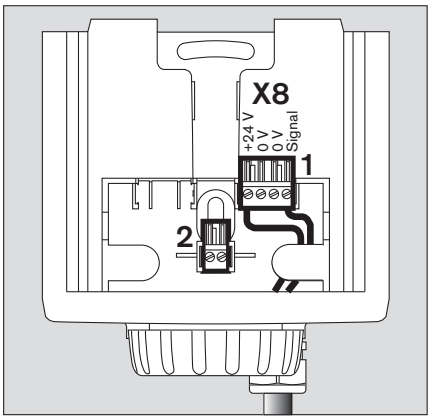
- Fit 2-wire connecting cable in cable gland, cut to length and strip ends (approx. 80 mm / 3.15").
- Shorten the shield (if installed) to prevent short-circuiting:
- Connect cable

1 Use a 4-pole terminal block (X8), Part No. 83 16 268, for the Dräger Polytron 7000 – Observe the polarity of the connections. Cut excess wires short or

2 secure them in centre terminals (Part No. 83 16 422).

1 Slide connecting terminal back into holder.

- Secure cable in holder.
- Fold up the installation notes and place them in the Dräger docking station for future use during commissioning.
- Refit raincover (protection against dust and splashing water).



Connecting to the central unit

- Connect shield to earth of central unit (e.g. housing, earth bar, etc.).

Connecting the Dräger Polytron 7000 transmitter to a Dräger control unit (such as Regard, QuadGard, Unigard or Polytron):

— Further information about the connection can be found in the instructions for the Dräger control unit.

Connecting the Dräger Polytron 7000 transmitter to control units with a 4 to 20 mA interfaced made by other manufacturers:

— For operation together with control units made by other manufacturers, care must be taken that the voltage at the transmitter does not drop below 16.5 V at a current of 3 mA and 8.0 V at a current of 22 mA. The supply voltage, the resistance of the cable and the load and the resistance of any installed safety barrier must be taken into account.

— Further information about the connection can be found in the instructions for the control unit being used.

Installing transmitter in mines where firedamp may occur

— Install a safety barrier with the appropriate explosion protection approval (device category M1) between the transmitter and the control unit.
— Only safety barriers or power supply units with the following characteristics may be used: U_O (V_{OC}) = 30 V, I_O (I_{SC}) = 0.3 A, P_O = 700 mW.
— Make sure the maximum permissible capacitance and inductance connected to the safety barrier or power supply are not exceeded (taking into account the line as well). The safety-related input parameters of the transmitter are as follows: Ci = 0 nF, Li = 50 µH.

Installing the transmitter in areas subject to explosion hazards of zone 0, 1 or Div. 1

● Install a safety barrier with the appropriate explosion protection approval (category 1, 2 or Div. 1) between the transmitter and the control unit.
— Only safety barriers with the following characteristics may be used: U_o (V_{oc}) ≤30 V, I_o (I_{sc}) ≤0.3 A, P_o ≤700 mW.
— Take care that the maximum permissible capacitance and inductance of connections to the safety barrier are not exceeded, also taking the cable into account. The safety-related input parameters of the transmitter are: C_i = 5 nF, L_i = 50 µH.

Transmitter supply units
(without HART-communication between Ex/Non-Ex area)
The following safety barriers are provided as examples only. Selected barriers must be acceptable to the authority having jurisdiction and comply with the assigned P3U entity parameters also taking the cable into account.

Manufacturer	Type	suitable for	R_{Cable} (Loop)	Note
MTL	MTL 5541	Zone 0, Div. 1	≤ 350 Ω	Suitable only for 2-wire
Pepperl & Fuchs	KFD2–CR–Ex1.30 200	Zone 0, Div. 1	≤ 400 Ω	Suitable only for 2-wire

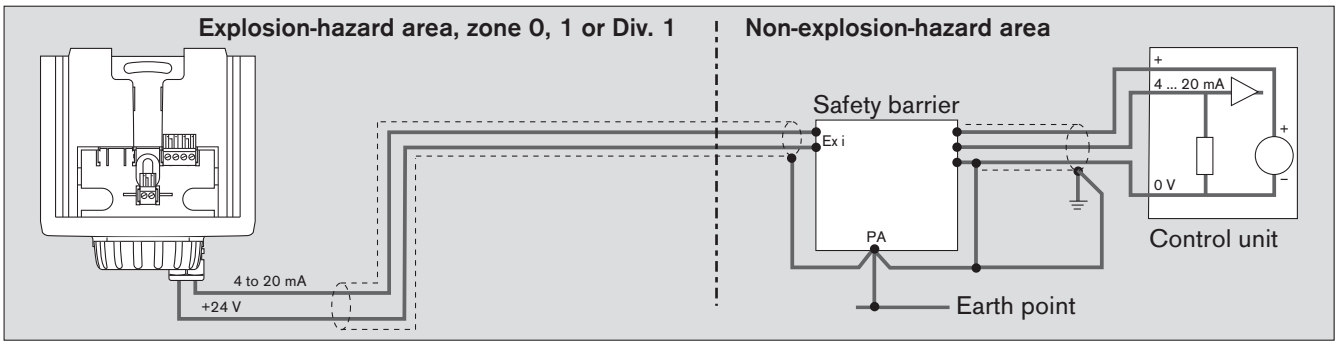
SMART transmitter supply units
(with HART-communication between Ex/Non-Ex area)
The following safety barriers are provided as examples only. Selected barriers must be acceptable to the authority having jurisdiction and comply with the assigned P3U entity parameters also taking the cable into account.

Manufacturer	Type	suitable for	R_{Cable} (Loop)	Note
Endress + Hauser	RN 221 N–B1 (ATEX)	Zone 0	≤ 380 Ω	Suitable only for 2-wire
	RN 221 N–C1 (FM)	Div. 1	≤ 380 Ω	Suitable only for 2-wire
	RN 221 N–D1 (CSA)	Div. 1	≤ 380 Ω	Suitable only for 2-wire
	RN 221 N–E1 (TIIS)		≤ 380 Ω	Suitable only for 2-wire
MTL	MTL 5541	Zone 0, Div. 1	≤ 400 Ω	Suitable for 2-wire and 3-wire
Pepperl & Fuchs	KFD2–STC4–Ex1	Zone 0, Div. 1	≤ 300 Ω	Suitable for 2-wire and 3-wire

— The cable resistances given apply for a load resistance of 250 Ω. Higher load resistances can drastically reduce the permissible cable resistance!
- When other barriers have been selected, care must be taken that the voltages on the transmitter do not fall below the following values when barrier parameters and cable resistance are taken into account:
  16.5 V for a current of 3 mA and 8.0 V for a current of 22 mA.
- If HART communication is to be used, the HART specifications must also be observed.

- The maximum possible cable lengths can be found in the table on page 19.
  In each case, use the line marked "Number of transmitters = 1".

— Connect shielding to earth point and/or 0 V (Ex i).



Installing the transmitters in explosion-hazard areas of zone 2

— Use only supply units or a safety barrier of the device category 3.
— Only supply units or safety barriers with the following characteristics may be used: U_O (V_{OC}) ≤ 30 V, I_O (I_{SC}) ≤ 0.3 A, P_O ≤ 700 mW.
— Take care that the maximum permissible capacitance and inductance of connections to the supply unit are not exceeded, also taking the cable into account.
  The safety-related input parameters of the transmitter are:
  C_i = 5 nF, L_i = 50 µH.

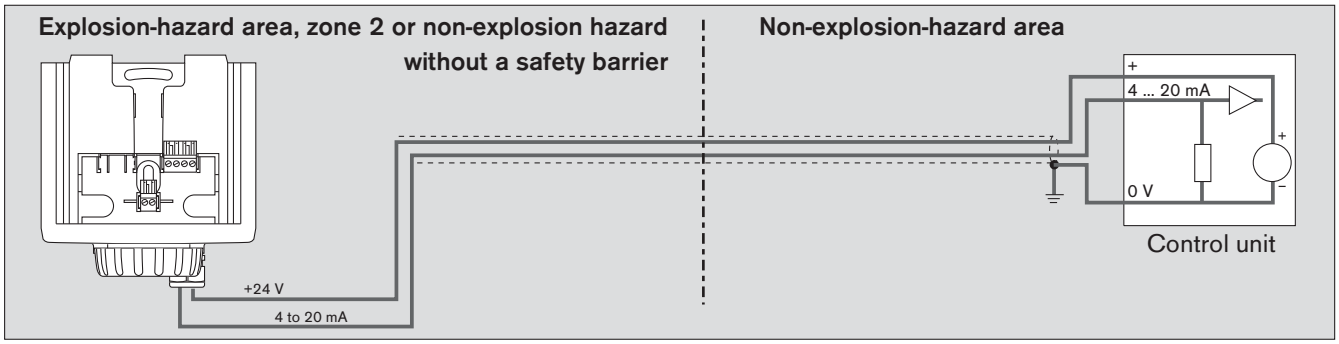
CAUTION
The category 1 marking has to be cut out from the rating-plate label. Once the unit has been used after installation in the above manner, it may never be installed in explosion-hazard areas of zone 0 or zone 1 (device category 1 or 2). Explosion hazard!

- The maximum possible cable lengths can be found in the table on page 21.
  In this table, select the line, " Number of transmitters = 1".

Installing the transmitters in non-explosion-hazard areas:

⚠ CAUTION
The explosion-protection markings has to be removed from the transmitter. Once the transmitter has been used after installation in this manner, it may never be installed in explosion-hazard areas.

- The maximum possible cable lengths can be found in the table on page 21. In this table, select the line, " Number of transmitters = 1".



Installing fieldbus communication on the transmitter

— The transmitter can be connected to a certified intrinsically safe fieldbus system, which supports FISCO (Fieldbus intrinsically safe concept).
— The PROFIBUS PA transmission technology for intrinsically safe applications is MBP. MBP stands for:
  – Manchester Coding (M)
  – Bus Powered (BP)
— 5 transmitters can be connected to a segment with a typical segment current of 100 mA.

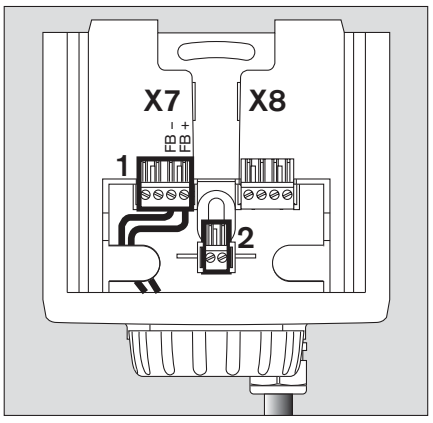
- Install the 2-wire connection cable in the cable gland, cut it to length and strip off the insulation (approx. 80 mm).
- Shorten the shield (if installed) to prevent short-circuiting.
- Connect cable:

1 Use a 4-pole terminal block (X7), Part No. 83 16 268, for the Dräger Polytron 7000 – Observe the polarity of the connections. Cut excess wires short or

2 secure them in center terminals (Part No. 83 16 422).

1 Slide connecting terminal back into holder.

- Secure cable in holder.
- Fold up the installation notes and place them in the Dräger docking station for future use during commissioning.
- Refit raincover (protection against dust and splashing water).



⚠ CAUTION
Insert 4-pole (X7) terminal block into left holder.

Installing the transmitter in areas subject to explosion hazards of Zone 0 or Zone 1:

- Only safety barriers with the following characteristics may be used: $U_{max} \leq 24$ V, $I_{max} \leq 0.38$ A, $P_{max} \leq 5.32$ W or those which correspond to the FISCO model ia or ib.

— The safety-related input parameters of the transmitter are as follows: $C_i = 5$ nF, $L_i = 10$ µH.

— The transmitter may only be connected in 2-wire connection to the left 4-fold terminal block (X7) of the docking station. No electrical connections may be made to the right 4-fold terminal block (X8).

Installing the transmitter in areas subject to explosion hazards of Zone 2:

— Make sure that the supply unit corresponds with the FISCO model ic and that the maximum permissible capacitance and inductance of connections to the supply unit are not exceeded, (also take the cable into account).

— The safety-related input parameters of the transmitter are: $C_i = 5$ nF, $L_i = 10$ µH.

— The transmitter may only be connected in 2-wire connection to the left 4-fold terminal block (X7) of the docking station. No electrical connections may be made to the right 4-fold terminal block (X8).

⚠ CAUTION
The category 1 marking has to be cut out from the rating-plate label. Once the unit has been used after installation in the above manner, it may never be installed in explosion-hazard areas of Zone 0 or Zone 1 (device category 1 or 2). Explosion hazard!

Connection to the control unit

- Connect shield to earth of central unit (e.g. housing, earth bar, etc.).

⚠ CAUTION
In the case of PROFIBUS devices, the shield must only be connected on one side of the cable to earth.

3-wire connection

— Connection to central device with at least 3-wire cable, 0.5 (AWG 20) to 2.5 mm^2 (AWG 13).

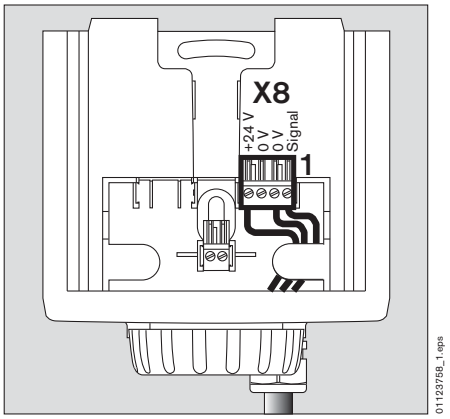
⚠ CAUTION
The supplied ferrite sleeves are to be used when installing the transmitter in three-wire technology. A ferrite sleeve must be pushed onto each core prior to connecting the cable to the four-pole terminal in the docking station.

Installing the 4 to 20 mA current loop on the transmitter

- Install the 3-wire connection cable in the cable gland, cut it to length and strip off the insulation (about 80 mm).
- Shorten the shield (if installed) to prevent short-circuiting:
- Connect cable

1 4-pin terminal for Dräger Polytron 7000 – observe polarity.
Slide connecting terminal back into holder.

- Secure cable in holder.
- Fold up the installation notes and place them in the Dräger docking station for future use during commissioning.
- Refit raincover (protection against dust and splashing water).



Connection to the control unit

- Connect shield to earth of central unit (e.g. housing, earth bar, etc.).

Connecting the Dräger Polytron 7000 transmitter to a Dräger control unit (such as Regard, QuadGard, Unigard or Polytron):

— Further information about the connection can be found in the instructions for the Dräger control unit.
— When operated from the mains supply, the Polytron control unit provides a supply voltage of at least 20 V. This must be taken into account when determining the maximum cable length (see the table on page 21).
— Unigard is not suitable for the connection of a Polytron 7000 transmitter equipped with a relay or pump module.

Connecting the Dräger Polytron 7000 transmitter to control units with a 4 to 20 mA interfaced made by other manufacturers:

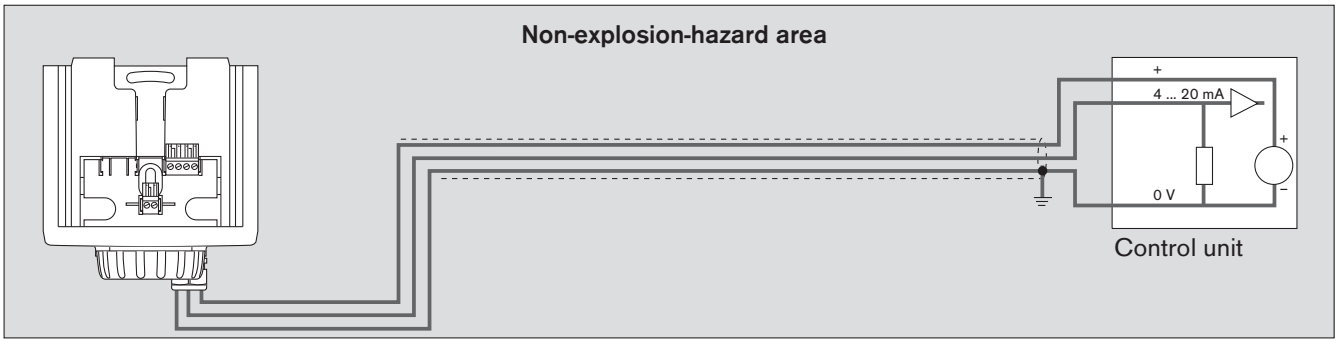
— Further information about the connection can be found in the instructions for the control unit being used.

Installing the transmitter in non-explosion-hazard areas:

⚠ CAUTION
Remove the explosion-protection markings from the transmitter. Once the transmitter has been used after installation in this manner, it may never be installed in explosion-hazard areas. Explosion hazard!

— When installing a transmitter in a non-explosion-hazard area, connect the cable shield and the negative pole of the supply voltage to earth at the switch cabinet or distribution panel.

— Ensure that the supply voltage provided by the control unit (ignoring the load resistance) is at least as high as specified in the tables of page 21 to page 22.
— If digital communication in accordance with HART is to be used, the load resistance of the supply unit must lie between 230 and 500 Ω.
— The permissible cable lengths are shown in the tables on page 21 to page 22. In each case, use the line marked "Number of transmitters = 1".



Connections between several transmitters and a control unit with HART multidrop connections

- Each transmitter must first be put into service separately. Use the menu item "Polling Address" to assign a different polling address in the range "1" to "15" to each transmitter which is to be connected to the multidrop cable (see page 70). It is best to assign sequential polling addresses, starting with "1".

Installing the transmitters in areas subject to explosion hazards of zone 0 or zone 1

- Depending on the supply unit, up to 7 transmitters can be connected to a 2-wire or 3-wire cable.
  The second cable gland is used for the cable to the next transmitter.
- Install a safety barrier with the appropriate explosion protection approval (category 1, 2 or Div. 1) between the transmitter and the control unit.

— Only safety barriers with the following characteristics may be used: U_o (V_{oc}) ≤30 V, I_o (I_{sc}) ≤0.3 A, P_o ≤700 mW.

— Take care that the maximum permissible capacitance and inductance of connections to the safety barrier are not exceeded, also taking the cable into account. The safety-related input parameters of the transmitter are: C_i = 5 nF, L_i = 50 µH.

— The safety barrier must be capable of transmitting the communications signals in both directions between the explosion-hazard area and the non-explosion-hazard area. Several manufacturers offer special SMART transmitter supply units for this purpose.

SMART transmitter supply units
(with HART-communication between Ex/Non-Ex area)
The following safety barriers are provided as examples only and have not been certified for use in combination with the P3U. Selected barriers must be acceptable to the authority having jurisdiction and comply with the assigned P3U entity parameters also taking the cable into account.

Manufacturer	Type	suitable for	R_{Cable} (Total)		
			for up to 5 transmitters	for up to 6 transmitters	for up to 7 transmitters
Endress + Hauser	RN 221 N–B1 (ATEX)	Zone 0	≤ 120 Ω	≤ 50 Ω	– – –
	RN 221 N–C1 (FM)	Div. 1			
	RN 221 N–D1 (CSA)				
	RN 221 N–E1 (TIIS)				
MTL	MTL 5042	Zone 0, Div. 1	≤ 33 Ω	≤ 27 Ω	≤ 20 Ω
Pepperl & Fuchs	KFD2–STC4–Ex1	Zone 0, Div. 1	≤ 90 Ω	≤ 10 Ω	– – –

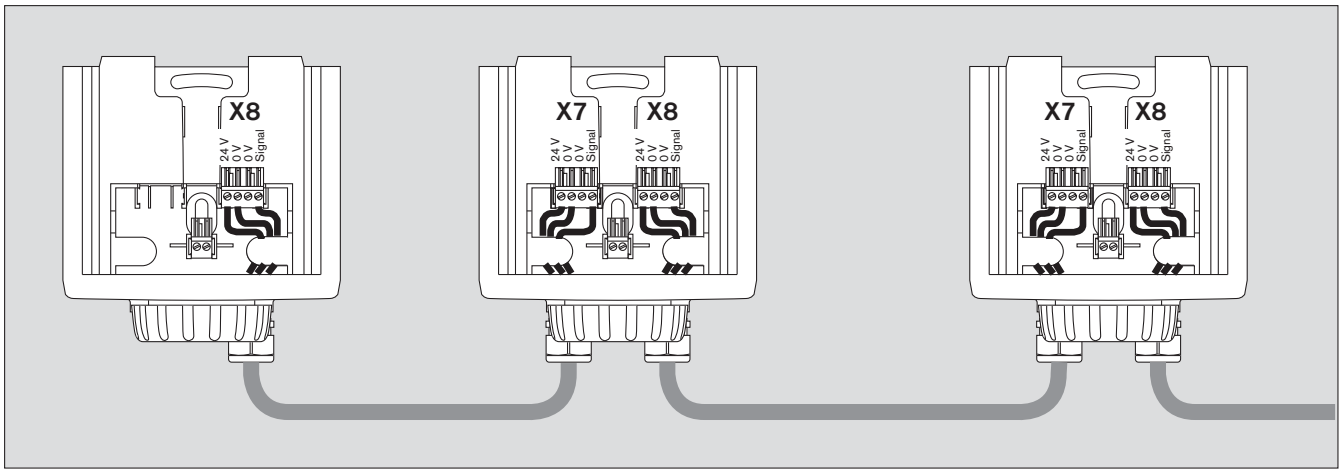
— If a HART hand-held terminal is used, the permissible values may be lower. Observe the safety-related parameters of the hand-held terminal.

— The cable resistances given apply for the maximum possible number of transmitters as well as a load resistance of 250 Ω. Higher load resistances can drastically reduce the maximum possible cable resistance!

- The following tables show permissible combinations of transmitters, supply voltages and maximum possible cable lengths.

— The capacitance values are typical values for commercially available shielded cables with PVC insulation. The use of cables with different capacity values will result in other cable lengths.

Transmitter supply unit	Number of transmitters	Maximum possible cable length			
		0.5 mm^2 265 pF/m	0.75 mm^2 320 pF/m	1.5 mm^2 375 pF/m	2.5 mm^2 400 pF/m
Endress + Hauser: RN 221 N	1	1042 m	921 m	828 m	792 m
	2	1007 m	890 m	801 m	766 m
	3	972 m	860 m	774 m	740 m
	4	936 m	829 m	747 m	714 m
	5	901 m	799 m	720 m	689 m
	6	702 m	768 m	693 m	663 m
MTL: MTL 5042	1	463 m	695 m	828 m	792 m
	2	463 m	695 m	801 m	766 m
	3	463 m	695 m	774 m	740 m
	4	463 m	695 m	747 m	714 m
	5	463 m	695 m	720 m	689 m
	6	379 m	569 m	693 m	663 m
	7	281 m	421 m	666 m	637 m
Pepperl & Fuchs: KFD2–STC4–Ex1	1	1042 m	921 m	828 m	792 m
	2	1007 m	890 m	801 m	766 m
	3	972 m	860 m	774 m	740 m
	4	936 m	829 m	747 m	714 m
	5	901 m	799 m	720 m	689 m
	6	140 m	211 m	421 m	663 m
Stahl: 9160/13–11–11	1	1042 m	921 m	828 m	792 m
	2	1007 m	890 m	801 m	766 m
	3	972 m	860 m	774 m	740 m
	4	936 m	829 m	747 m	714 m
	5	901 m	799 m	720 m	689 m
	6	865 m	768 m	693 m	663 m
	7	281 m	421 m	666 m	637 m



Installing the transmitters in explosion-hazard areas of zone 2 without a safety barrier

— Use only supply units of the device category 3.

- For safety reasons, we recommend that not more than 8 transmitters be connected to a 2-wire or 3-wire cable.

— Take care that the maximum permissible capacitance and inductance of connections to the supply unit are not exceeded, also taking the cable into account.
The safety-related input parameters of the transmitter are:
C_i = 5 nF, L_i = 50 µH.

⚠ CAUTION
The category 1 marking has to be cut out from the rating-plate label. Once the unit has been used after installation in the above manner, it may never be installed in explosion-hazard areas of zone 0 or zone 1 (device category 1 or 2). Explosion hazard!

Installing the transmitter in non-explosion-hazard areas:

- For safety reasons, we recommend that not more than 8 transmitters be connected to a 2-wire or 3-wire cable.
If the transmitters are equipped with relay or pump modules, not more than 4 transmitters should be connected to one cable.
The second cable gland is used for the cable to the next transmitter.

CAUTION
The explosion-protection marking has to be removed from the transmitter. Once the transmitter has been used after installation in this manner, it may never be installed in explosion-hazard areas. Explosion hazard!

- The following tables show permissible combinations of transmitters, supply voltages and maximum possible cable lengths.

— The capacitance values are typical values for commercially available shielded cables with PVC insulation. The use of cables with different capacity values will result in other cable lengths.

Transmitter without relay or pump module (2-wire):

Minimum supply voltage	Number of transmitters	Maximum cable length with a load resistance of 250 Ω			
		0.5 mm^2 265 pF/m	0.75 mm^2 320 pF/m	1.5 mm^2 375 pF/m	2.5 mm^2 400 pF/m
20 V	1	1042 m	921 m	828 m	792 m
	2	1007 m	890 m	801 m	766 m
	3	972 m	860 m	774 m	740 m
	4	585 m	829 m	747 m	714 m
24 V	4	936 m	829 m	747 m	714 m
	5	901 m	799 m	720 m	689 m
	6	865 m	768 m	693 m	663 m
	7	830 m	737 m	666 m	637 m
	8	794 m	707 m	639 m	611 m
	9	390 m	585 m	612 m	586 m
28 V	9	758 m	676 m	612 m	586 m
	10	722 m	645 m	584 m	560 m
	11	687 m	614 m	557 m	534 m
	12	651 m	584 m	530 m	508 m
	13	616 m	553 m	503 m	482 m
	14	334 m	502 m	476 m	456 m
	15	78 m	117 m	234 m	390 m

Transmitter with relay module (3-wire):

Minimum supply voltage	Number of transmitters	Maximum cable length with a load resistance of not more than 500 Ω			
		0.5 mm^2 265 pF/m	0.75 mm^2 320 pF/m	1.5 mm^2 375 pF/m	2.5 mm^2 400 pF/m
20 V	1	287 m	431 m	828 m	792 m
	2	144 m	216 m	431 m	718 m
	3	96 m	144 m	287 m	479 m
	4	72 m	108 m	216 m	359 m
24 V	1	386 m	579 m	828 m	792 m
	2	193 m	289 m	579 m	766 m
	3	129 m	193 m	386 m	643 m
	4	96 m	145 m	289 m	482 m
28 V	1	429 m	644 m	828 m	792 m
	2	215 m	322 m	644 m	766 m
	3	143 m	215 m	429 m	715 m
	4	107 m	161 m	322 m	537 m

Transmitter with pump module (3-wire):

Minimum supply voltage	Maximum possible flow-rate	Number of transmitters	Maximum cable length with a load resistance of not more than 500 Ω			
			0.5 mm^2 265 pF/m	0.75 mm^2 320 pF/m	1.5 mm^2 375 pF/m	2.5 mm^2 400 pF/m
20 V	0.5 L/min	1	161 m	241 m	482 m	792 m
		2	80 m	120 m	241 m	401 m
		3	54 m	80 m	161 m	268 m
		4	40 m	60 m	120 m	201 m
24 V	1.0 L/min	1	233 m	349 m	699 m	792 m
		2	116 m	175 m	349 m	582 m
		3	78 m	116 m	233 m	388 m
		4	58 m	87 m	175 m	291 m
	1.5 L/min	1	135 m	203 m	406 m	586 m
		2	68 m	102 m	203 m	338 m
		3	45 m	68 m	135 m	226 m
		4	34 m	51 m	102 m	169 m
28 V		1	271 m	406 m	812 m	792 m
		2	135 m	203 m	406 m	677 m
		3	90 m	135 m	271 m	451 m
		4	68 m	102 m	203 m	338 m

Transmitter with relay and pump modules (3-wire):

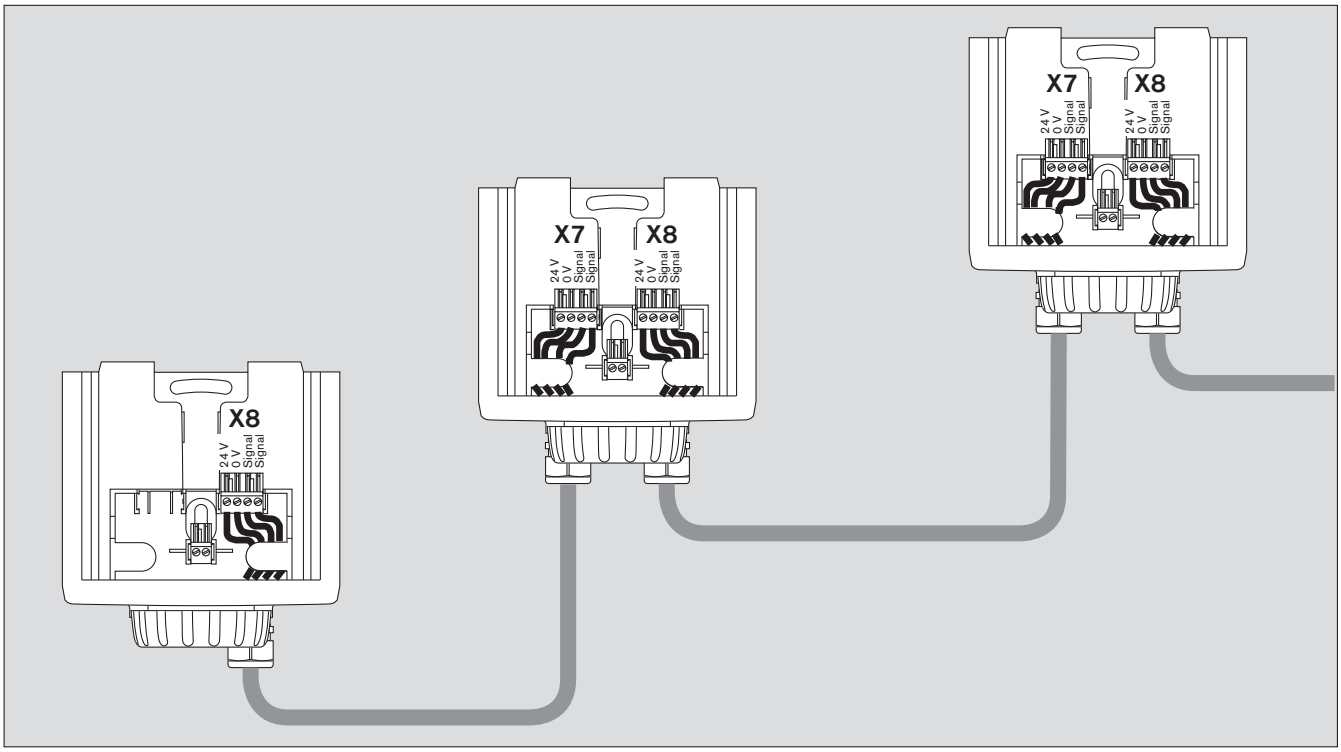
Minimum supply voltage	Maximum possible flow-rate	Number of transmitters	Maximum cable length with a load resistance of not more than 500 Ω			
			0.5 mm^2 265 pF/m	0.75 mm^2 320 pF/m	1.5 mm^2 375 pF/m	2.5 mm^2 400 pF/m
20 V	0.5 L/min	1	110 m	164 m	329 m	548 m
		2	55 m	82 m	164 m	274 m
		3	37 m	55 m	110 m	183 m
		4	27 m	41 m	82 m	137 m
24 V	1.0 L/min	1	161 m	241 m	482 m	792 m
		2	80 m	120 m	241 m	401 m
		3	54 m	80 m	161 m	268 m
		4	40 m	60 m	120 m	201 m
	1.5 L/min	1	90 m	134 m	269 m	448 m
		2	45 m	67 m	134 m	224 m
		3	30 m	45 m	90 m	149 m
		4	22 m	34 m	67 m	112 m
28 V		1	179 m	269 m	537 m	792 m
		2	90 m	134 m	269 m	448 m
		3	60 m	90 m	179 m	298 m
		4	45 m	67 m	134 m	224 m

4-wire connection

— Connection to central device with at least 4-wire cable, 0.5 (AWG 20) to 2.5 mm^2 (AWG 13).

Installing the LON Communication on the transmitter

— For installation using LON communication up to 63 Polytron 7000 can be connected to a four wire cable in any configuration including bus, star, loop and mixed.



- Insert the 4-wire connecting cable in the cable gland, cut it to length and strip the insulation (approx. 80 mm).
- Shorten the shield (if installed) to prevent short-circuiting:
- Connect cable

1 4-pin terminal for Dräger Polytron 7000 – observe polarity.
Slide connecting terminal back into holder.

- Secure cable in holder.
- Fold up the installation notes and place them in the Dräger docking station for future use during commissioning.
- Refit raincover (protection against dust and splashing water).

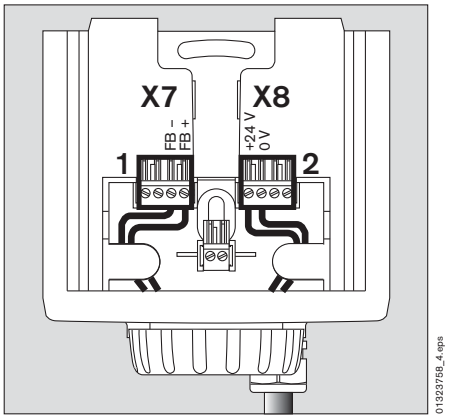
Installing the transmitter in non-explosion-hazard areas:

CAUTION
With 4-core connection the transmitter has no Ex protection. Once the transmitter has been used after installation in this manner, it may never be installed in explosion-hazard areas. Explosion hazard!

Installing fieldbus communication on the transmitter

— The PROFIBUS PA transmission technology for intrinsically safe applications is MBP. MBP stands for:
  – Manchester Coding (M)
  – Bus Powered (BP)
— 5 transmitters can be connected to a segment with a typical segment current of 100 mA.

- Install the 4-wire connection cable in the cable gland, cut it to length and strip off the insulation (approx. 80 mm).
- Shorten the shield (if installed) to prevent short-circuiting.
- Connect cable:



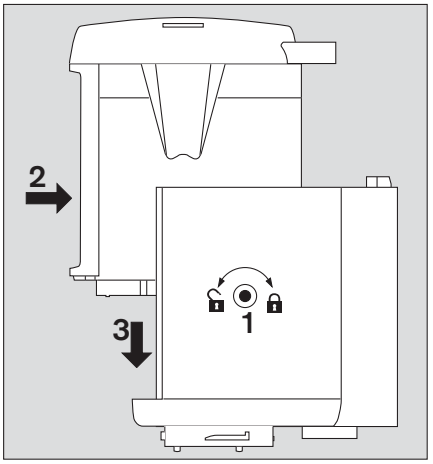
1 4-pin terminal block for Dräger Polytron 7000, observing the polarity.
2 4-pin terminal block for Dräger Polytron 7000, observing the polarity.

- Slide connecting terminal back into holder.
- Secure cable in holder.
- Fold up the installation notes and place them in the Dräger docking station for future use during commissioning.
- Refit raincover (protection against dust and splashing water).

Installing the transmitter in 4-wire connection:

⚠ CAUTION
With 4-core connection the transmitter has no Ex protection. Once the transmitter has been used after installation in this manner, it may never be installed in explosion-hazard areas. Explosion hazard!

Installing the measuring unit Dräger Polytron 7000



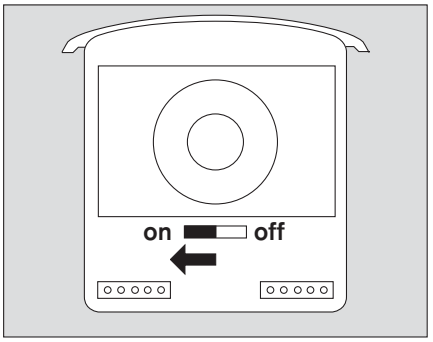
- Remove the rain cover from the previously installed docking station.
- Examine seal for signs of dirt and clean if necessary.

1 Check position of eccentric catches and correct if necessary.
The eccentric opening must point upwards, engaged position.

⚠ CAUTION
Use only a 5 mm Allen key without a ball head.

- Check the polarity and cable routing and check that the connector is securely seated; rectify as necessary (see the installation notes for the Polytron docking station).
- Unpack the Dräger Polytron 7000 measuring unit.

Setting the switch for the backup battery



- Check the position of the switch on the bottom of the unit.
This switch must be set to "on"; otherwise, the time, date and data saved in the Datalogger and the Event Logger will be lost in the case of a power failure.

2 Insert the measuring unit about halfway up the docking station and slide it in as far as it will go.

3 Lower the unit along the front edge of the docking station. About 5 mm before its hits the stop, the resistance will increase as the connector engages with the socket on the printed circuit board.

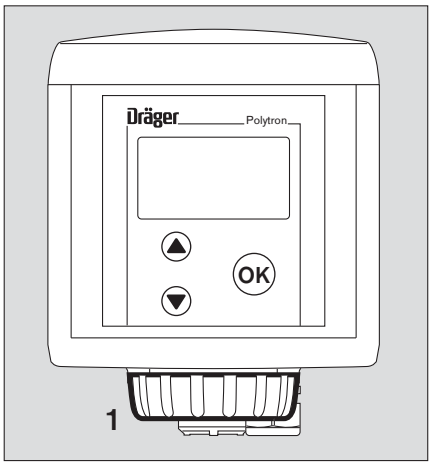
NOTE
Check that the terminals in the docking station are correctly aligned if the connector does not engage correctly! Ensure that the front bottom of the measuring unit is flush with the bottom of the Docking Station. Apply pressure to the measuring unit until it "clicks" into place. If the fronts are not flush, the measuring unit is not completely sealed and could get water inside the transmitter!

1 Turn the eccentric catches clockwise with an Allen key to lock the measuring unit ($\Rightarrow$ = approx. 180°).

Fitting the sensor

1 Remove bayonet ring from transmitter, remove dummy plate.
- Remove sensor from packaging.
- Remove the short-circuit strap from the sensor (if it is fitted).
- There is a coded connector on the back of the sensor. Place the sensor in the opening with the connector at the back and the Dräger logo at the front. Before plugging the connector in the socket, ensure that they are identically coded. Incorrect connection can damage the sensor!
- Secure sensor in transmitter with bayonet ring.

- If necessary, calibrate the sensor as described on page 44.
- If pre-calibrated sensors are used, the alarm chain must be tested with, for example, the bump test.



Installing accessories

Various accessories are available for the Dräger Polytron 7000 transmitter and may also be installed later.

Daisy chain kit – Cable Entry Kit

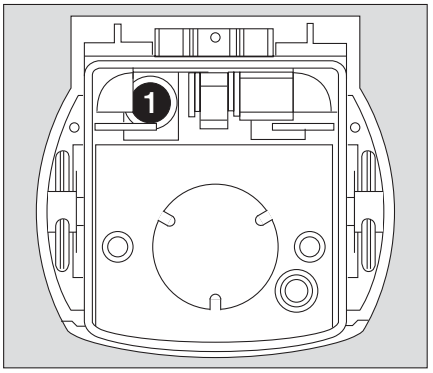
Intended use
Daisy chain kit – 83 17 282:
— For the connection of several transmitters to one bus cable (daisy chain or multidrop connection)

Contents of the kit
— Cable gland with nut, 4-pole orange terminal block

Preparing the docking station
- Install the docking station as described in the installation notes 90 23 760.

1 Break or drill out the prepared breakthrough for the second cable gland from the inside of the docking station.
The hole should have a diameter of 20.5 mm.

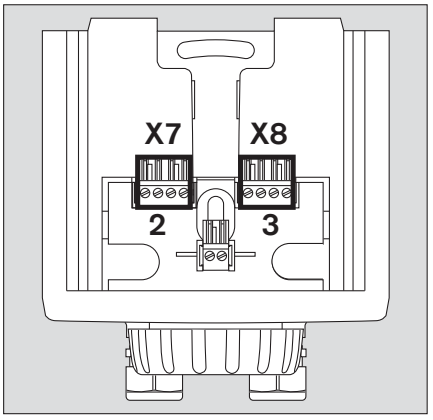
- Check that the docking station has no loose parts, and clean it if necessary.
- Insert the nut of the cable gland into the docking station.
- Screw in the cable gland from the outside of the docking station and tighten it.



Electrical connections
- Connect the wiring as described in the installation notes for the docking station (90 23 760).

2 Insert the 4-pole terminal block into the holder on the mounting plate.
If necessary:

- refit the raincover (protection against dust and splashing water).



NOTE
The two 4-pole terminal blocks for input (3) and output (2) are electrically connected 1:1 to each other inside the transmitter.

Installing the measuring unit
- Install the measuring unit as described in the installation notes 90 23 759.

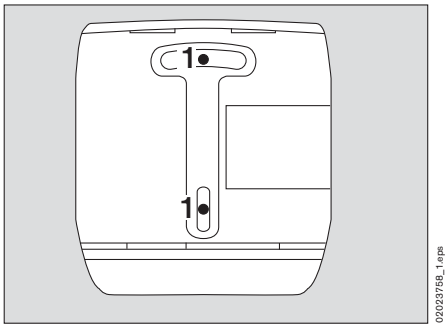
— Due to the second terminal block, the resistance when installing the measuring unit is slightly higher.
Make sure that the measuring unit is fully lowered and hits the stop.

Remote sensor

Intended use

Remote Sensor Adapter Polytron 7000 - 83 17 275:

— For installation of the sensor at a distance of up to 30 m from the Polytron 7000 transmitter.



Remote Cable + Sensor plug 5 m Polytron 7000 – 83 17 270Remote Cable + Sensor adapter, 15 m Polytron 7000 – 83 17 998,
Remote Cable + Sensor plug 30 m Polytron 7000 – 83 17 999:

⚠ CAUTION
The cable of the remote adapter may be shortened at the end with the connector. The cable may not be extended. The use of a different cable is not permitted!

If a Remote Sensor Adapter with sensor is used on a transmitter installed in accordance with device category 3:

CAUTION
Remove the Category 1 marking from the transmitter. After being installed in the manner described here, the accessory may never be used in explosion-hazard areas of zone 0 or zone 1 (device category 1 or 2)! Explosion hazard!

If a Remote Sensor Adapter with sensor is used on a transmitter installed in a non-explosion-hazard area:

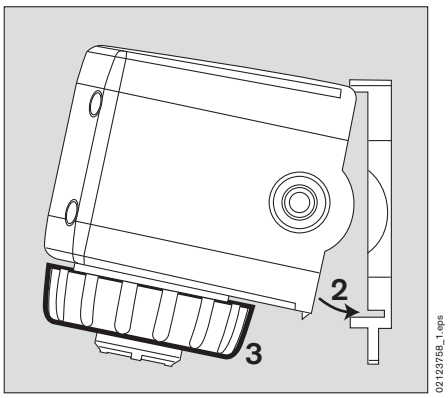
CAUTION
Remove the explosion-protection marking from the transmitter. After being installed in the manner described here, the accessory may never be used in explosion-hazard areas! Explosion hazard!

Wall mounting

1 Drill the holes for the mounting plate. (A drilling template is provided for this on page 139). The mounting holes are 50 ±4 mm apart.

- Screw the mounting plate of the remote sensor adapter to the wall at the desired position.

2 Slide the case of the remote sensor on to the mounting plate until it snaps into position.

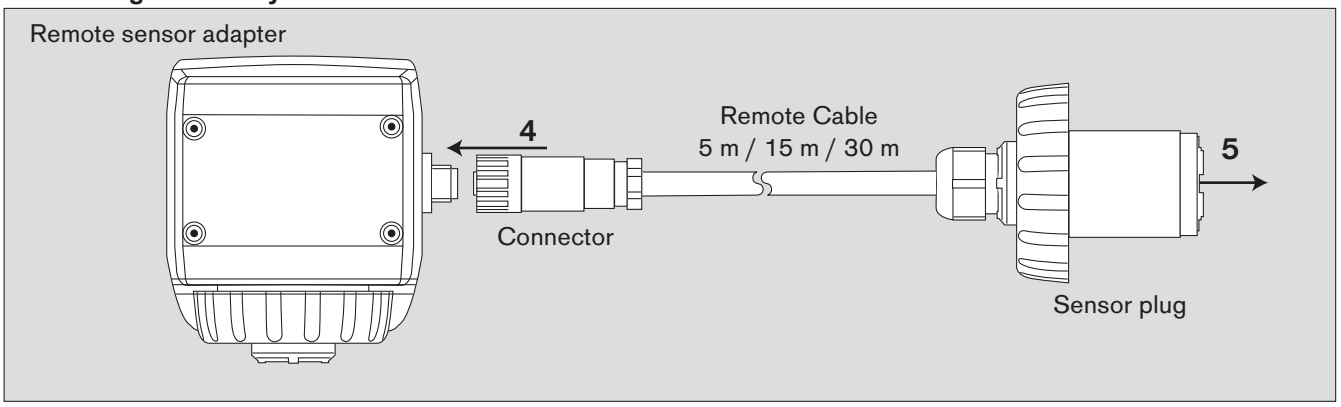


Installing the sensor

3 Unscrew the bayonet ring from the transmitter and remove the blanking disc.

- Remove sensor from packaging.
- Insert the sensor in the opening with the "Dräger" logo pointing to the front.
- Secure the sensor with the bayonet ring.

Connecting to the Polytron 7000

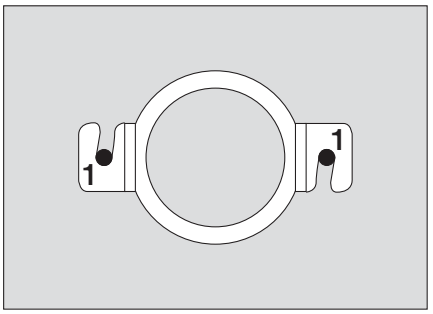


4 Connect the plug of the Remote Cable (cable length 5, 15 or 30 m) to the remote sensor adapter and secure it by turning the ring clockwise.
5 Insert the sensor plug in the opening on the Dräger Polytron 7000 transmitter with the "Dräger" logo pointing to the front.
- Secure the sensor plug with the bayonet ring.

NOTE
The remote sensor is recognised automatically by the transmitter. No further installation steps are required.

Duct adapter for remote sensor

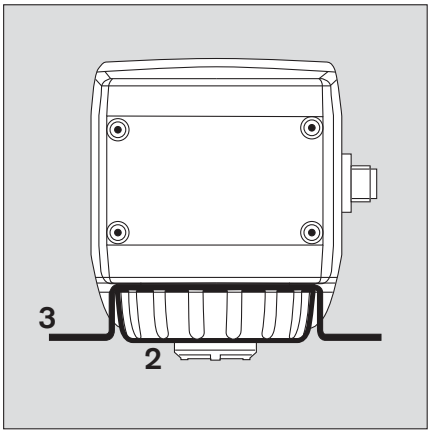
Purpose
Duct adapter for remote sensor – 83 17 617:
— For mounting a remote sensor on a pipe or duct,
— For measuring the gas concentration in the pipe or duct.



Mounting
- Drill a hole for the sensor opening (diameter 35+1 mm) at the desired measuring point on the pipe.
- Button the sealing sleeve into the hole.
- Align the retaining clip so that it is centred on the hole.

1 Drill the holes for the securing screws. A drilling template is provided on page 139.

2 Loosen the bayonet ring of the remote sensor.
3 Place the retaining clip on the pipe of the case and install the bayonet ring again.
- Insert the sensor opening into the sealing sleeve.
- Turn the retaining clip to the correct position and screw it down.



NOTE
To avoid faulty measurements, pay close attention to the fitting of the sensor in the sealing sleeve!

Removal/changing the sensor
- Loosen the securing screws.
- Swing the retaining clip to one side.
- Pull the remote sensor out of the sealing sleeve.
- Change the sensor.
- Install the remote sensor again.

Dräger Polytron 7000 software dongles

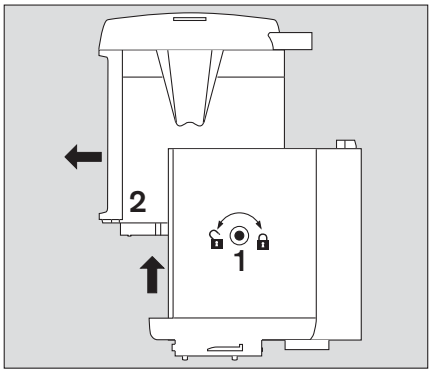
Intended use
Dräger Polytron 7000 software dongle – 83 17 618, 83 17 619 or 83 17 860:
— For activating additional functions in the Dräger Polytron 7000:

Data Dongle 83 17 618 Colour-code blue	— Activates the Event Logger, the Datalogger and the graphical concentration display.
Sensor Dongle 83 17 619 Colour-code silver	— Activates the sensor self-test.
Sensor Diagnostic Dongle 83 17 860 Colour-code green	— Activates the sensor self-test, the display of the remaining sensor lifetime and the sensor diagnostic function.

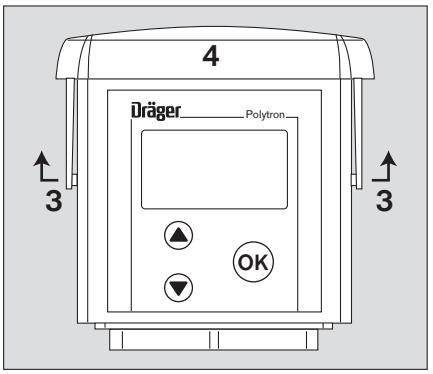
Installing the software dongles
1 Release the measuring unit with an Allen key by turning the eccentric catches counter-clockwise (⇒ = approx. 180°).

NOTE
Use only a 5 mm Allen key without a ball head.

2 Push the measuring unit up to about half height and then pull it forwards out of the docking station.
— The unit must be disconnected from the mains!



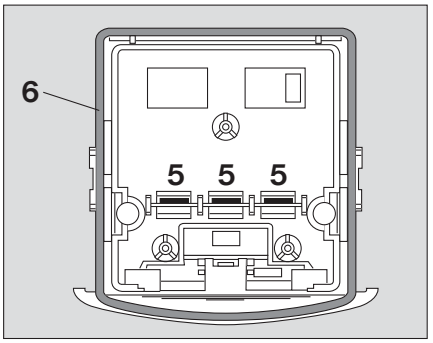
3 Bend the snap-hooks on the cover of the measuring unit slightly outwards to release them.
4 Remove the cover.



5 Hold the dongle with the "Dräger" logo pointing towards the measuring unit. Then insert the dongle into any of the three slots.
Up to three dongles may be installed simultaneously.

Place the cover on the measuring unit and press it down until it snaps into position.

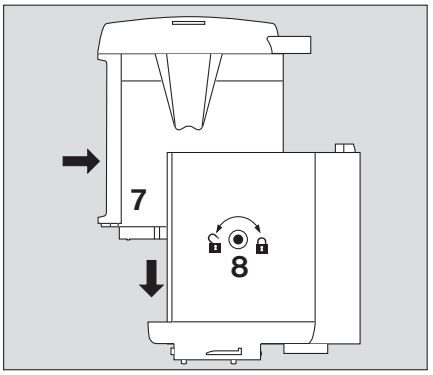
CAUTION
6 Take care that pressure is applied only to the sleeve (6) of measuring unit. Pressure on the inner structure can damage the unit.



7 Slide the measuring unit into the docking station and lower it into position, see page 25.
8 Turn the eccentric catches clockwise with an Allen key to lock the measuring unit (⇒ = approx. 180°)

.

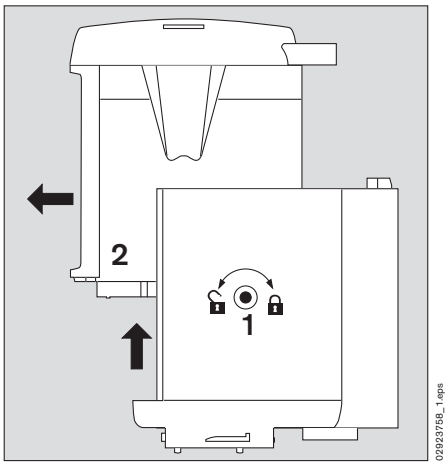
NOTE
Correct operation of the software dongle can be checked by switching the measuring unit on and selecting the menu items » Information «, » Instrument «, » Module « from the unit menu, see page 55.



Relay module

Intended use
Relay module – to order:
— For switching of actuators, alarm generators, etc. on the basis of the measured gas concentration.
— **The unit must be disconnected from the mains!**

⚠ CAUTION
If a Polytron 7000 is subsequently equipped with the relay module and/or the pump module, the complete unit loses its explosion-protection approval. The user must ensure that no related approval markings are left on the Polytron 7000. The explosion-protection markings has to be removed from the transmitter. The use of the Polytron 7000 with a pump module and/or relay module installed is not permitted in explosion-hazard areas! Explosion hazard!



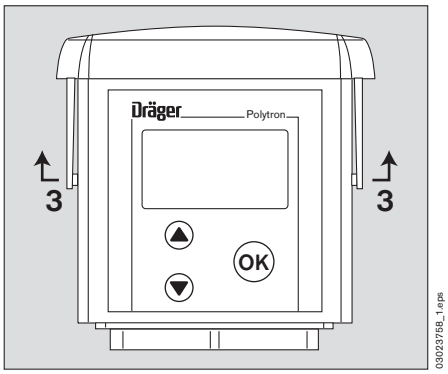
NOTE
For operation with the relay module, the transmitter must have a 3-wire connection to the control unit.

Preparing the docking station
- Remove any existing explosion-protection label from the docking station.

1 Release the measuring unit with an Allen key by turning the eccentric catches counter-clockwise (⇒ = approx. 180°).

⚠ CAUTION
Use only a 5 mm Allen key without a ball head.

2 Slide the measuring unit halfway upwards and then pull it forward out of the docking station.

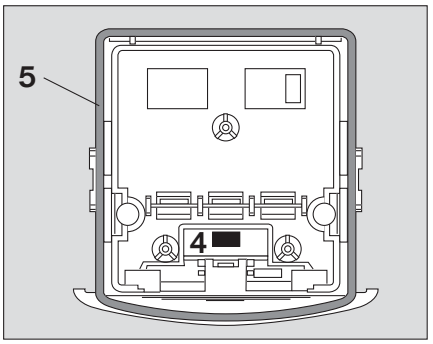


Converting the measuring unit

3 Bend the snap-hooks on the cover of the measuring unit slightly outwards to release them.
- Remove the cover.

4 Plug the connection cable into the male connector behind the display, ensuring that the cable is not twisted.

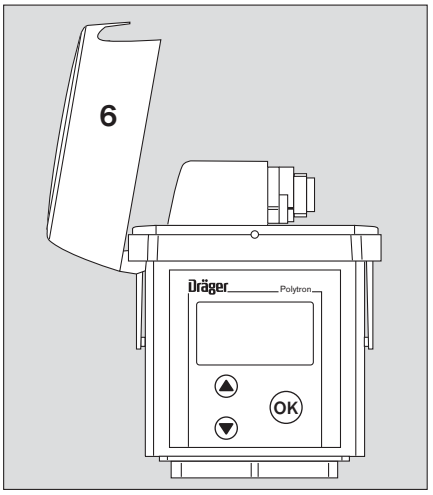
- Place the relay module on the measuring unit and snap it into position on both sides.
  In order to make this step easier, the relay cover may be removed.



⚠ CAUTION
5 Take care that pressure is applied only to the sleeve of measuring unit. Pressure on the inner structure can damage the unit.

After connecting the relay module to the measuring unit:

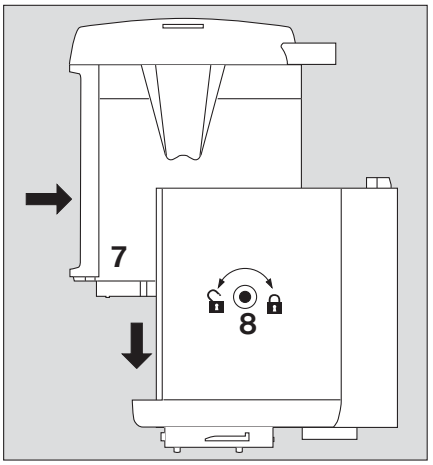
6 Fit the cover again.



Mounting the measuring unit with relay module

7 Slide the measuring unit with relay module into the docking station and lower it into position, see page 25.

8 Turn the eccentric catches clockwise with an Allen key to lock the measuring unit (⇒ = approx. 180°).



Connecting the devices to be switched

The relay module has three 3 potential-free outputs, each capable of switching 250 V / 5 A:

— A1 relay (switches when the A1 gas alarm is active)
— A2 relay (switches when the A2 gas alarm is active)
— Fault relay (switches in the case of a device fault)

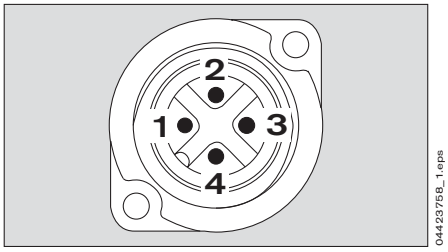
Setting the alarm thresholds: see page 64.

- Connect the devices to be switched to the cable sockets.
  Cable sockets of the following types may be used:

— Binder	Type 692	Part No. 99–0210–00–04
— Amphenol	Type C16-1	Part No. T 3109–001
— Hirschmann	Type CA3 LD	Part No. 934–125–100
— Dräger Safety		Part No. 18 90 086

Pin assignments of the built-in plug on the relay module:
(see also the inside of the relay cover)
1 normally closed
2 common
3 normally open
4 not connected

- Note the assignments of the relay outputs on the relay cover.
- Insert and lock the plug.
- Close the relay cover.

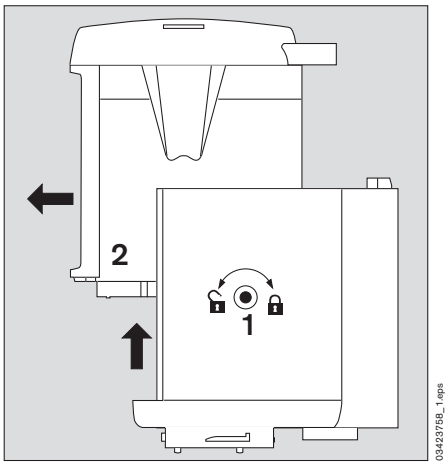


Pump module

Intended use
Pump module – to order:
1 For drawing measuring gas from a remote site into the Dräger Polytron 7000 transmitter.

⚠ CAUTION
If a Polytron 7000 is subsequently equipped with the relay module and/or the pump module, the complete unit loses its explosion-protection approval. The user must ensure that no related approval markings are left on the Polytron 7000. Remove or cut away any existing approval label. The use of the Polytron 7000 with a pump module and/or relay module installed is not permitted in explosion-hazard areas! Explosion hazard! Suitable explosion protection measures such as flame traps are required when drawing measuring gas from potentially explosive atmospheres!

NOTE
For operation with the pump module the electrical connection must be done in 3-wire connection.



⚠ CAUTION
The Polytron 7000 must be disconnected from the supply voltage before the pump module is installed. Explosion hazard!

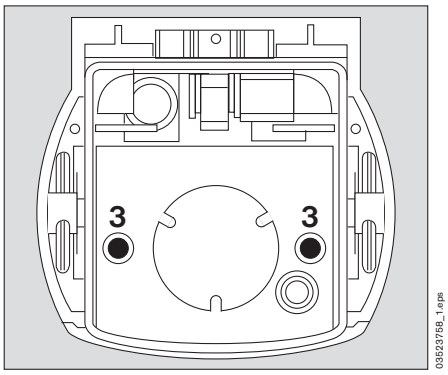
Preparing the docking station

- Remove any existing approval label/explosion-protection label from the docking station.

1 Release the measuring unit with an Allen key by turning the eccentric catches counter-clockwise (🔒 ⇒ 🔓 = approx. 180°).

⚠ CAUTION
Use only a 5 mm Allen key without a ball head.

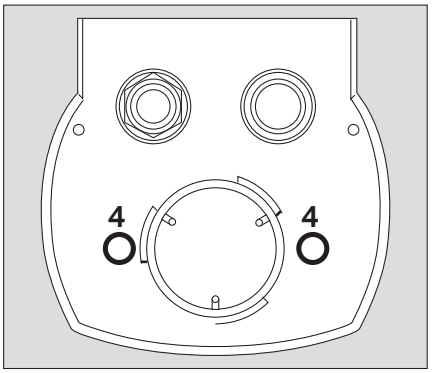
2 Slide the measuring unit halfway upwards and then pull it forward out of the docking station.
3 Special gush holes are provided on the left and right-hand sides of the sensor recess.
The glass tubes of the pump can be inserted in these holes.
Punch or drill the holes all the way through the docking station from inside.
Each hole should have a 6 mm channel.
Then deburr the holes from the outside.



4 Check, from the bottom side of the docking station, that the holes go all the way through.

- Check that the docking station has no loose parts, and clean it if necessary.

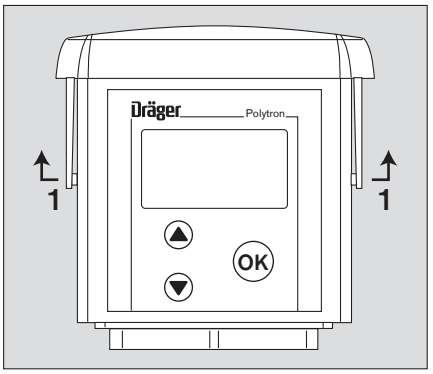
3 Remove the O-rings from the glass tube and insert them into the grooves on the bottom of the docking station.



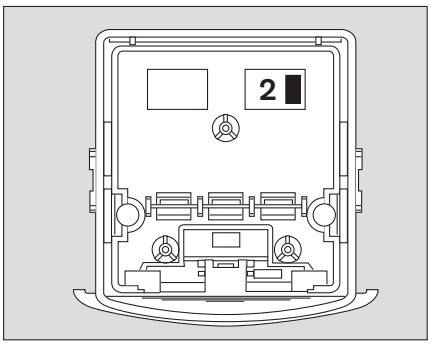
Installing the pump in the transmitter

1 Bend the snap-hooks on the cover of the measuring unit slightly outwards to release them.

- Remove the cover.



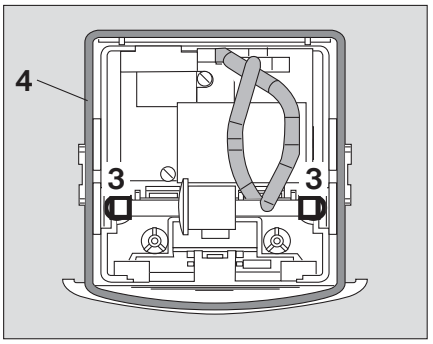
2 Plug the pump connecting cable to the terminal strip.



3 Slide the glass tube into the holes on the sides of the case and insert the pump module into its holder. Lay the hoses so that they lie inside the case.

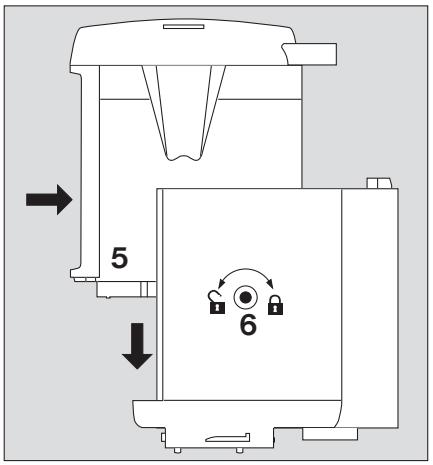
- Place the cover on the measuring unit and press it down until it snaps into position.

⚠ CAUTION
4 Take care that pressure is applied only to the sleeve of measuring unit. Pressure on the inner structure can damage the unit.



- Insert the measuring unit about halfway up the docking station and slide it in as far as it will go.
- Lower the unit along the front edge of the docking station. About 5 mm before its hits the stop, the resistance will increase as the connector engages with the socket on the printed circuit board.

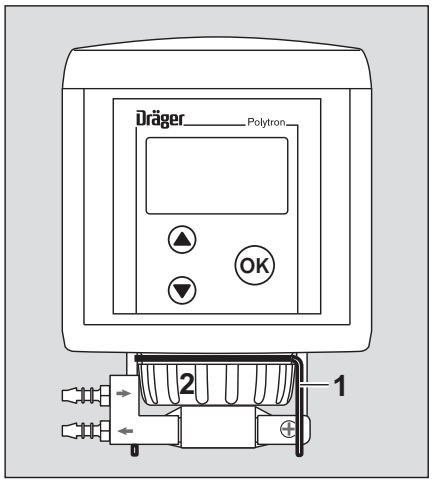
5 Slide the measuring unit with pump module into the docking station and lower it into position, see page 25.
6 Turn the eccentric catches clockwise with an Allen key to lock the measuring unit (⇒ = approx. 180°).



Installing the sensor and pump adapter

- Unscrew the bayonet ring from the transmitter and remove the blanking disc.
- Place the sensor in the opening with the Dräger logo facing the front, and push upwards gently until the connector engages.

1 Place the fastening ring over the sensor opening.
2 Secure the sensor with the bayonet ring.



The assembly direction of the pump adapter is determined by the gas flow direction between pump and sensor:

— Connectors for intake and exhaust air point to the left, the ⊕ symbol is visible from the front; the pump is positioned in front of the sensor in gas flow direction; the sensor is positioned on the positive pressure side of the pump. This is the preferred operating mode for all sensors.
— Connectors for intake and exhaust air point to the right, the ⊖ symbol is visible from the front; the pump is positioned behind the sensor in gas flow direction; the sensor is positioned on the negative pressure side of the pump. This operating mode should only be selected for special reasons.

⚠ CAUTION
This operating mode is not permissible for DrägerSensor O_2 LS (6809630) and DrägerSensor O_2 (6809720)!

- Insert the pump adapter sleeves into the holes on the underside of the docking station. The seal slides over the sensor.

1 Turn the securing ring clockwise until the pump adapter is secure.

Notes on installation of the inlet line

The material selected for the inlet hose or inlet pipe and the length of the inlet line will affect the reaction time of the measured signal. In the worst cases, reactions with the selected material, or absorption in this material, will prevent a measurable gas concentration from reaching the sensor.

— Please contact your Dräger sales partner for choice on suitable selection of tubing/hose.
— Maximum permissible pressure difference between flow inlet and the environment of the transmitter: 50 mbar

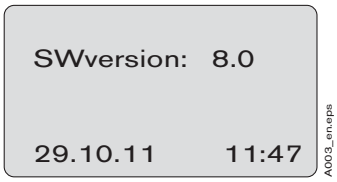
— The pressure difference between the flow inlet and the environment of the transmitter can cause an additional measurement error.

⚠ **CAUTION**
In order to check for leaks, we recommend that you measure the flow at the inlet point and behind the transmitter before using the pump module for the first time and every six months thereafter. Do not block the lower gas line of the pump adapter. This can damage the gas sensor.

Start-up

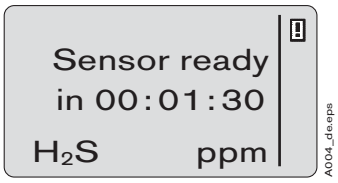
- Switch on power supply.
  The transmitter begins its warm-up routine:

— The software version, the date and the time are displayed.



NOTE
For the correct operation and functionality it is important to set the date and time.

— The sensor is now warming up. The remaining warming-up time for the sensor is displayed.



NOTE
Note on the operation with relay module: During the warm-up period, the relay module indicates a fault. Alarms A1 and A2 are not indicated during the warm-up period.

— The sensor is ready for use.

— Depending on the type of sensor installed, the warming-up period time may last between 5 minutes and 12 hours. See the related information in the operating instructions for the sensor. The warm-up phase may take longer in extremely high or low temperatures.

When the sensor has warmed up:

- Calibrate sensor, page 44, when a pre-calibrated sensor is not used.

— Transmitter is ready for use.

- Check the transmission of the signals between to the control unit and the initiation of alarms, see the function group » Analogue interface « on page 71.

Analogue signal

— A current between 4 and 20 mA flows through the transmitter during normal operation. This current is proportional to the gas concentration.

— The Dräger Polytron 7000 transmitter uses various current values to indicate the operational status of the transmitter:

Current	Meaning
4 mA[1)]	Zero point
20 mA[1)]	Full-scale value
<3.2 mA[1)]	Transmitter fault
3.8 mA ... 4 mA[1)]	Sensor drift below zero point
20 mA ... 20.5 mA[1)]	Full-scale value exceeded
>23 mA	Fault in analogue output
static signal: 3.4 mA[1)] dynamic AC signal: 5 mA [1)]for 0.4 seconds and 3 mA[1)] for 0.7 seconds	Maintenance signal and signal during the warm-up period (configured on delivery: static)
Every 10 seconds[2)] for 1 second[2)] <3.2 mA[1)2)]	Warning signal (factory setting: off)

1) Output current on delivery. The values may deviate by ±0.5 mA depending on the set offset current.
2) Factory setting. Can be configured as desired, page 71.

⚠ CAUTION
Exceeding or falling below the transmitter supply voltage specified in the technical data can lead to an incorrect display of the analogue signal!

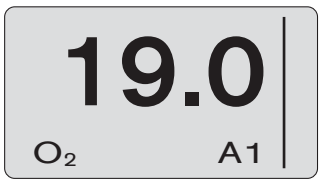
Display

— In measuring mode, the display shows the actual gas concentration, e.g.:

A006_en.eps

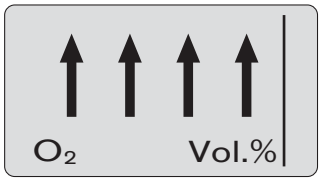
An alarm is triggered:

— when rising above - for O_2 also when falling below - the alarm levels for the concentration alarm,



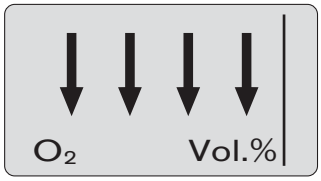
A013_en.eps

— When the full scale deflection is exceeded:
The special symbol » ↑↑↑↑ « is displayed instead of the measurement value.



A007_en.eps

— The measured value drops below the measuring range:
The special symbol » ↓↓↓↓ « is displayed instead of the measurement value.



A008_en.eps

The following icons may be displayed on the right side of the display in measuring mode in order to indicate the operating status of the unit:

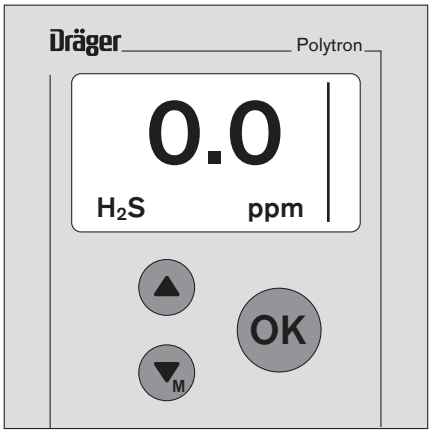
- A warning exists – see page 55 for information on how warnings are displayed.
  The information can be retrieved in info mode, see page 40.
- A fault exists – see page 55 for information on how faults are displayed.
- Maintenance signal to the control unit, see page 75
- A pump is installed.
- There is a pump flow fault, see page 63
- The measured value exceeds the full-scale value of the analogue interface
- The measured value is less than the zero-point of the analogue interface
- The analogue interface is set to a fixed value (e.g. for multidrop) and is not transmitting measured values
- "Predictive" maintenance: the sensor is ready for use
- "Predictive" maintenance: the sensor is ready for use but nearing the end of its operating lifetime
- "Predictive" maintenance: the sensor is still ready for use but should be replaced as soon as possible
- The Datalogger is active in roll mode. For details on activating and deactivating the Datalogger, see page 79
- The Datalogger is active in stack mode. For details of activating and deactivating the Datalogger, see page 81

Activating info mode

The info mode is used to display information on general unit settings and on the unit status.

- Press and hold the » ▲ « key (longer than 3 seconds) – information about the units is displayed on several screens.

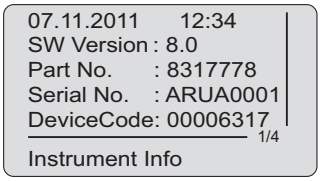
— Briefly press the » ▲ « key to move to the next screen.
— Briefly press the » ▼ « to move back to the previous screen.
— The info mode can be terminated at any time by pressing the » OK « key.
— If no key is pressed for 30 seconds, the unit automatically returns to its previous state.



Example of info mode:

Screen 1

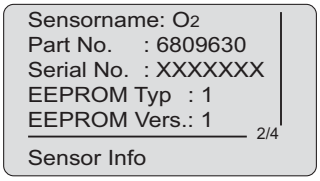
Instrument information
Line 1 – Date and time
Line 2 – Software version
Line 3 – Unit Part No.
Line 4 – Unit Serial No.
Line 5 – Unit code



A009_en.eps

Screen 2

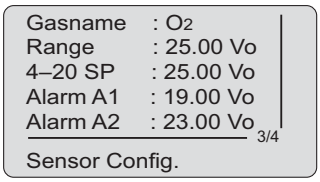
Sensor information:
Line 1 – Sensor name
Line 2 – Sensor Part No.
Line 3 – Sensor Serial No.
Line 4 – EEPROM type
Line 5 – EEPROM version



A010_en.eps

Screen 3

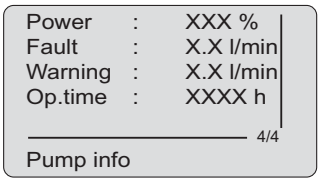
Sensor configuration:
Line 1 – Gas name
Line 2 – Measuring range (can not be change) and unit of measurement
Line 3 – Measuring range for the analogue interface.
Displayed only, if the analogue interface card is installed
Line 4 – A1 alarm threshold and unit of measurement[1)]
Line 5 – A2 alarm threshold and unit of measurement[1)]



A011_en.eps

Screen 4 [2)]

Pump Infos:
Line 1 – Pump flow
Line 2 – Threshold error
Line 3 – Threshold warning
Line 4 – Pump run time



A014_en.eps

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

If "xx.xx.xx xx:xx" is displayed instead of the date and time, or if an incorrect date and time are displayed:
(only after the cock has been reset due to a power failure)

- Set the date and time, see page 67.

⚠ CAUTION
If the date and time are not set correctly, some functions (such as calibration) cannot be executed!

Maintenance

Maintenance intervals

Before starting operation:
- Check the calibration, see page 44.
- Check the transmission of signals to the control unit and the triggering of alarms, page 74.

At regular intervals,
to be defined by the person responsible for the gas warning installation:
- Check the transmission of signals to the control unit and the triggering of alarms, page 74.

  If a selective filter specific to the sensor is being used:
- Replace the selective filter –
  See the related operating instructions for the sensor for details of the capacity of the selective filter being used.

At regular intervals defined in accordance with the sensor being used by the person responsible for the gas warning system:
- Calibrate the sensor, see page 44.
  The interval for regular calibration depends on the sensor being used and on the operating conditions.
  The transmitter calculates, from the selected calibration interval (see page 56), when the next calibration is due.
  Specific calibration data for the sensor, see the operating instructions for the sensor.

Every six months:
- Inspection by specialists.
  The inspection intervals must be established in each individual case and shortened if necessary, depending on technical safety considerations, engineering conditions and the technical requirements of the equipment.
  We recommend that a service agreement be concluded with DrägerService and that repairs also be carried out by them.

  When using the pump module:
- In order to check for leaks, measure the flow at the inlet point and behind the transmitter.

As required:
- Replace sensor, page 46.

Calibrating the unit

— Ensure that the sensor is warmed up before it is calibrated. See the sensor data sheet for the warming-up time.
— For some sensors (such as oxygen sensors) the function » zero-point calibration « is simply a test of the sensor function. The zero point is not actually calibrated since this is not necessary for these sensors.

— **For critical applications,** the calibration intervals should be defined in accordance with the recommendations in EN 50073[1)], EN45544-4[2)] and national regulations.

Note the calibration sequence!

- First check the zero point and calibrate it if necessary, immediately after this, check the sensitivity and adjust it as necessary.

— Never calibrate the sensitivity before calibrating the zero point.

— Calibration cannot be carried out if the date and time are not set.

- Setting the date and the time, page 67.

— Calibration menu, page 58 to page 59.

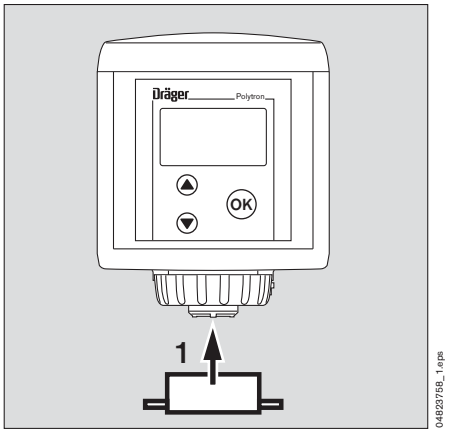
— Zero gas and test gas: see the information in the sensor data sheet and on the pages 116 to 119.

⚠ CAUTION
Test gas must not be inhaled. Risk to health! Care must be taken about the risks which can arise when using test gas; hazard instructions and safety advice must be observed. For details, see appropriate DIN Safety Data Sheets.

Calibrating with test gas

- Use a test-gas cylinder with pressure-reduction valve (a stainless-steel pressure reduction valve for aggressive gases). Observe the information in the sensor data sheet.

1 Mount a calibration adapter Part No. 68 06 978 (with two hose connectors) on the Polytron 7000.



- Vent the test gas leaving the adapter into a fume cupboard or into the open air (with a hose connected to the second connector on the calibration adapter).

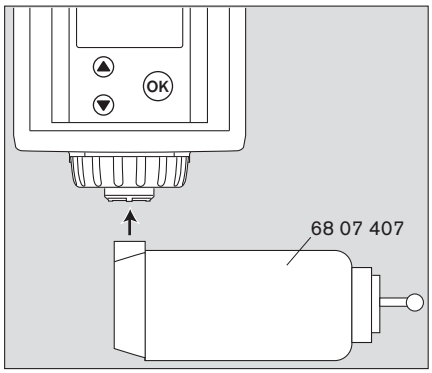
1) EN 50073 – Guidelines for selection, installation, use and maintenance of devices for the detection and measurement of flammable gases and oxygen.
2) EN 45544-4 – Electrical devices for the direct detection and direct concentration measurement of toxic gases and vapours – Part 4: Guidelines for selection, installation, use and maintenance.

Calibration with test-gas ampoules

- Use the calibration flask (Part No. 68 03 407) – Observe the information in the sensor data sheet.
- Follow the instructions printed on the calibration flask and enclosed with the test-gas ampoules.

For units without a pump:

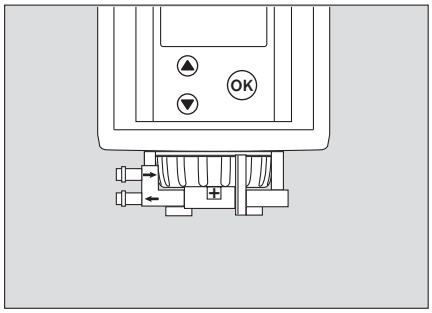
1 Fit the adapter and calibration bottle to the Polytron 7000.



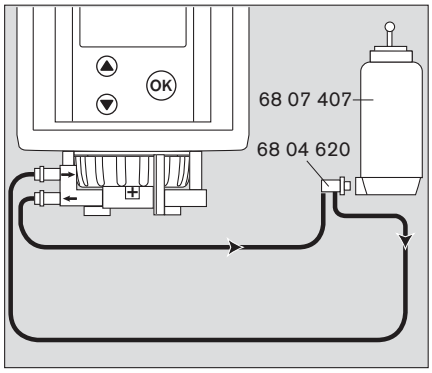
- Break the test-gas ampoule inside the calibration flask.
- Wait until the measured value has settled (see the operating instructions for the sensor for the necessary waiting period). Then carry out calibration.

For units with a pump:

— The pump adapter is already installed on the Polytron 7000.



- Insert the adapter (Part No. 68 04 620) in the calibration flask – connect the hoses.
- Break the test-gas ampoule inside the calibration flask and wait until the measured value has settled (see the operating instructions for the sensor for the necessary waiting period). Then carry out calibration.



Setting up the unit

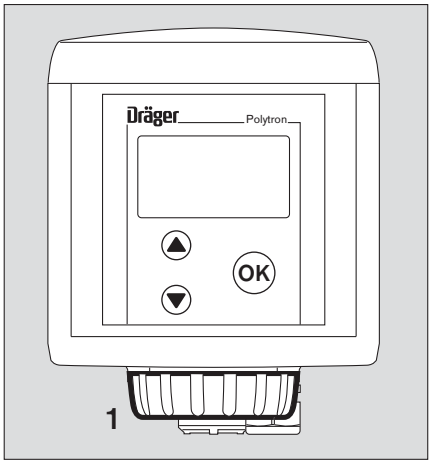
- Individual settings can be made:
— via the keypad in menu mode
— via the HART interface,
— with the Dräger hand-held terminal (DHHT)

NOTE
After setting up the unit automatically with the copy function of the Dräger Handheld Terminals, the plausibility of the settings must be checked.

Replacing the sensor

The sensor can be replaced, if necessary, without interrupting the power supply in the explosion-hazard area.
Use only DrägerSensors which are approved for use with the Dräger Polytron 7000 transmitter.

In the menu » Settings «, select the submenu » Sensor « and then the function » Change sensor « – page 76.



1 Remove bayonet ring from transmitter; pull out old sensor.
- Remove sensor from packaging. Make sure that it is approved for use with the transmitter.
- Remove the short-circuit strap from the sensor (if it is fitted).
- There is a coded connector on the back of the sensor. Place the sensor in the opening with the connector at the back and the Dräger logo at the front. Before plugging the connector in the socket, ensure that they are identically coded. Incorrect connection can damage the sensor!

1 Secure sensor in transmitter with bayonet ring.

- It is possible to mark the transmitter with the label enclosed in the packaging. It will then be easy to identify the type of gas for which the transmitter is intended if there is a mains failure.

- Check sensor function.
— If an identical sensor (sensor with the same Part No.) was previously installed, the complete configuration of the transmitter remains unchanged. Otherwise, the transmitter is configured with the default values (see the operating instructions for the sensor).
See also » Sensorlock «, page 77.

Disposal of electrochemical sensors:

— Sensors must be disposed of as special waste**.**

⚠ CAUTION
Do not throw sensors into the fire – explosion hazard. Do not open sensors forcibly – risk of caustic burns.

Note the relevant waste disposal regulations.
Further information can be obtained from the relevant local authority and from appropriate waste disposal companies.

Sensor-diagnosis function

This function is active only if the Polytron 7000 is equipped with a sensor diagnosis dongle (Part No. 83 17 860).

— Extended sensor self-test function, taking such things as the temperature, gas monitoring and remaining sensitivity into account.

— During normal operation, the sensor status is indicated by the sensor-diagnosis icon in the display:

The sensor is ready

The sensor is ready, but is approaching the end of its operating lifetime

The sensor is still ready, but it should be replaced as soon as possible

Fault – Cause – Remedy

If the display will not function: Have the transmitter checked by DrägerService.
The fault and warning numbers shown in the following tables are displayed in the menu under » Information «, » Instrument «, » Fault « or » Warnings « – see page 55.

Fault number	Cause	Remedy
# 1	Serious data error in unit – various causes.	Initialise the unit with the menu items » Settings «, » Instrument «, » Init. device «, page 68. If this error occurs again: have the transmitter checked by DrägerService.
# 2	Serious unit fault – various causes.	Have the transmitter checked by DrägerService.
# 61	Data error on the interface card – various causes	Have the transmitter checked by DrägerService.
# 63	Hardware fault or software error in the pump module.	Change the pump module, page 34.
# 64	Gas flow of the pump module falls below the configured fault threshold. Reliable measurements are no longer possible.	Check the hoses for blockages, If necessary adjust pump flow.
# 65	Open-circuit in 3-wire cable.	Check the connections.
# 67	Bad contact of the relay module.	Check connector of the relay module or fit it again.
# 100	Unit cannot detect a sensor.	Remove the sensor and install it again, page 46. If the problem persists, check the sensor plug or install a new sensor.
# 101	Sensor data error in the unit.	Remove the sensor and install it again, page 46. If this error occurs again: have the transmitter checked by DrägerService.
# 102	Unit does not support this sensor version.	Use a compatible sensor, see the ordering list on page 93.
# 103	Sensor data error in the unit.	Initialise the sensor with the menu items » Settings «, » Sensor «, » Sensor-EC «, » Init. sensor «, page 78. If this error occurs again: have the transmitter checked by DrägerService.
# 106	Zero-point not correctly.	Zero-point calibration, page 58.
# 107	Sensitivity calibration not executed correctly.	Repeat sensitivity calibration, page 59.
# 108	Sensor data error.	Replace the sensor, page 46.
# 109	Unit fault.	Check the sensor contacts; otherwise have the transmitter checked by DrägerService.
# 121	Fresh-air calibration (first step of autocalibration) not executed correctly.	Repeat autocalibration, page 60. Make sure that the ambient air is free of other gases.
# 125	Sensor not ready.	Replace the sensor, page 46.
# 129	Electrolyte liquid evaporates	Refill electrolyte. See sensor data sheet.

Fault number	Cause	Remedy
# 130	The function » Sensor lock « is active. A sensor with a different Part No. has been inserted.	Deactivate the function » Sensor lock «, page 77 or use a sensor with the same Part No. as the one which was removed.
# 134	Bad contact between the sensor and the sensor card.	Check the sensor contacts. Remove and reinstall the sensor several times. If the problem persists, install a new sensor, page 46.
# 136	Sensor hardware fault.	Remove the sensor and install it again. If the problem persists, install a new sensor, page 46.

Warning number	Cause	Remedy
# 1	Data error in the unit. Certain functions such as the Datalogger or the dongle functions may not be available.	Initialise the unit with the menu items » Settings «, » Instrument «, » Init. device «, page 68. If this error occurs again: have the transmitter checked by DrägerService.
# 51	Datalogger is in stack mode and is 100 % full. No more data can be recorded.	Read out the data. Then clear and restart the Datalogger
# 52	Datalogger is in stack mode and is 90 % full.	Read out the data as soon as possible. Then clear and restart the Datalogger.
# 53	No valid date and/or time is set.	Set the date and time, page 67.
# 58	Software dongle was removed without logging off.	Deactivate the function in the menu » Settings «, » Instrument «, » SW dongle «, » XXX dongle «, page 69.
	Hardware fault in the software dongle.	Change the software dongle, page 30.
# 64	Pump gas flow falls below the warning threshold.Reliable measurements are no longer possible.	Check the hoses for blockages, If necessary adjust pump flow.
# 106	Increased zero-point offset.	Zero-point calibration, page 58.
# 111	Sensor is not working in the specified temperature range.	Operate sensor in the specified temperature range (see Instructions for Use of the sensor).
# 112	Sensor near end of life.	Replace the sensor, page 46.
# 114	Calibration interval expired.	Recalibrate the unit, page 44.
# 115	Sensor was operate for too long with a high concentration.	Reduce overgassing.
# 119	Sensor is not yet fully warmed up. An increased measuring error must be expected.	Wait until the sensor has fully warmed up.
# 120	The sensor has been exposed to an excessively high gas concentration for a long period.	Reduce the exposure to high gas concentrations. If this does not help, replace the sensor, page 46.
# 131	Bad sensor, no longer operating.	Replace the sensor, page 46.
# 132	Electrolyte liquid evaporates. Measurements will soon no longer possible.	Refill electrolyte. See sensor data sheet.
# 135	Information such as the Part No. and the Serial No. is not available.	Disconnect the unit from the mains and restart it. If this error occurs again: have the transmitter checked by DrägerService.

Menu functions

The menu can be operated, as desired:
— from the keypad (with integrated display) of the transmitter,
— from a HART-compatible Hand Held Terminal (HHT),
— from a HART-compatible control unit or
— from a Polytron 7000 Palm Pilot 515 (non-Ex version) or
Palm Pilot 515x Ex version.

If the keypad is used, the menus can be operated with the three keys » ▲ «, » ▼ « and » OK « as well as via display.

Key » ▲ «
— Use this key to move upwards through the menus.

Key » ▼ «
— Use this key to move downwards through the menus.
— If the key is held down for more than 3 seconds, the main menu is opened.
— If the key is held down for longer than 1 second and less then 3 seconds, the quick menu is opened (the Info menu is displayed without prompting for a password).

Key » OK «
— This key is used to confirm inputs and selected menus and functions

Menu structure

Overview: page 51.

The unit has two operating modes: measuring mode and menu mode.
Menu mode contains the menus » Information «, » Calibration « and » Settings «.

Menu » Information «

The menu » Information « can be opened by any user. However, the user is unable to make any changes with this menu option.

Menu » Calibration «

This menu permits routine operations needed for the regular maintenance of the transmitters.
It should be accessible to persons who are responsible for such maintenance.
If the maintenance password is entered, only this menu is accessible.

Menu » Settings «

This menu permits the setting of individual transmitter and sensor parameters.
It should be accessible to authorised persons from the measuring and regulation department or the work safety department. If the password for this menu is entered, the menu » Calibration « is also accessible.

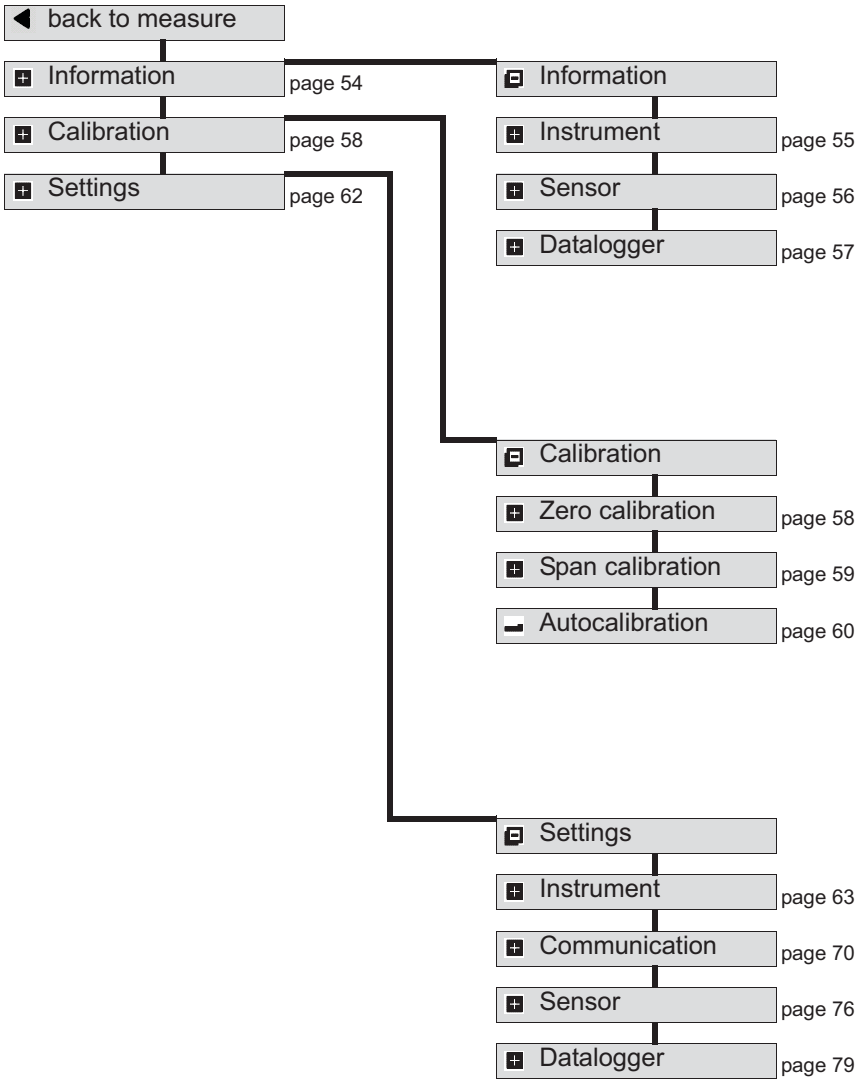
The passwords for the menus » Calibration « and » Settings « can be changed at any time, page 67.

Default password settings when the unit leaves the factory:

Password for the menu » Calibration «: **_ _ _ 1**

Password for the menu » Settings «: **_ _ _ 2**

Overview of the menu structure



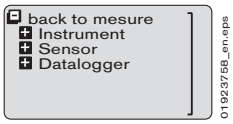
Information about the sub-menus and function:

- See the specified page.

Basic operating procedures

Switching to quick-menu mode

- Press the » ▼ « for longer than 1 second but less than 3 seconds to open the quick menu. Information on the status and the settings of the transmitter can be queried here, see page 54.



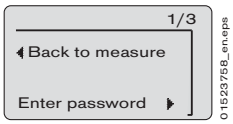
Switching to menu mode

- Press the » ▼ « for longer than 3 seconds. You will then be prompted for the password.

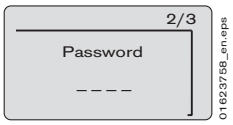
Entering the password

In measuring mode:

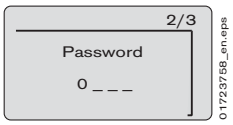
- Press the » ▼ « for longer than 3 seconds. You will then be prompted for the password.



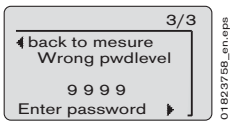
- Use the » ▼ « key to move to the line » Enter password « and press the » OK « key. The password entry screen appears.



- Use the » OK « and » ▲ « keys to set each of the four positions of the password and press the » ▼ « key to confirm each position.



— After you have confirmed the last position, the menu corresponding to the entered password is opened. If the entered password is invalid, a suitable error message is displayed.



Navigation in the menu

Graphical symbols (icons) simplify the navigation through the various menus:

Together with the text » Back «, » Menu «, etc. »
— Exit from the menu or return to previous menu.

Closed folder
— This item contains further functions or sub-menus.

Open folder
— The functions and sub-menus shown here are contained in this item.

Function
— If activated, functions can be executed in a single step or several steps.

Selection activated
— Press the » OK « key for functions which can be selected and activated.

List closed / complete to the top
— There are no further functions, menus or sub-menus above those currently displayed.

List can be scrolled up
— There are further functions, menus or sub-menus above those currently displayed.

List closed / complete to the bottom
— There are no further functions, menus or sub-menus below those currently displayed.

List can be scrolled down
— There are further functions, menus or sub-menus below those currently displayed.

Next
— Execute the related action.

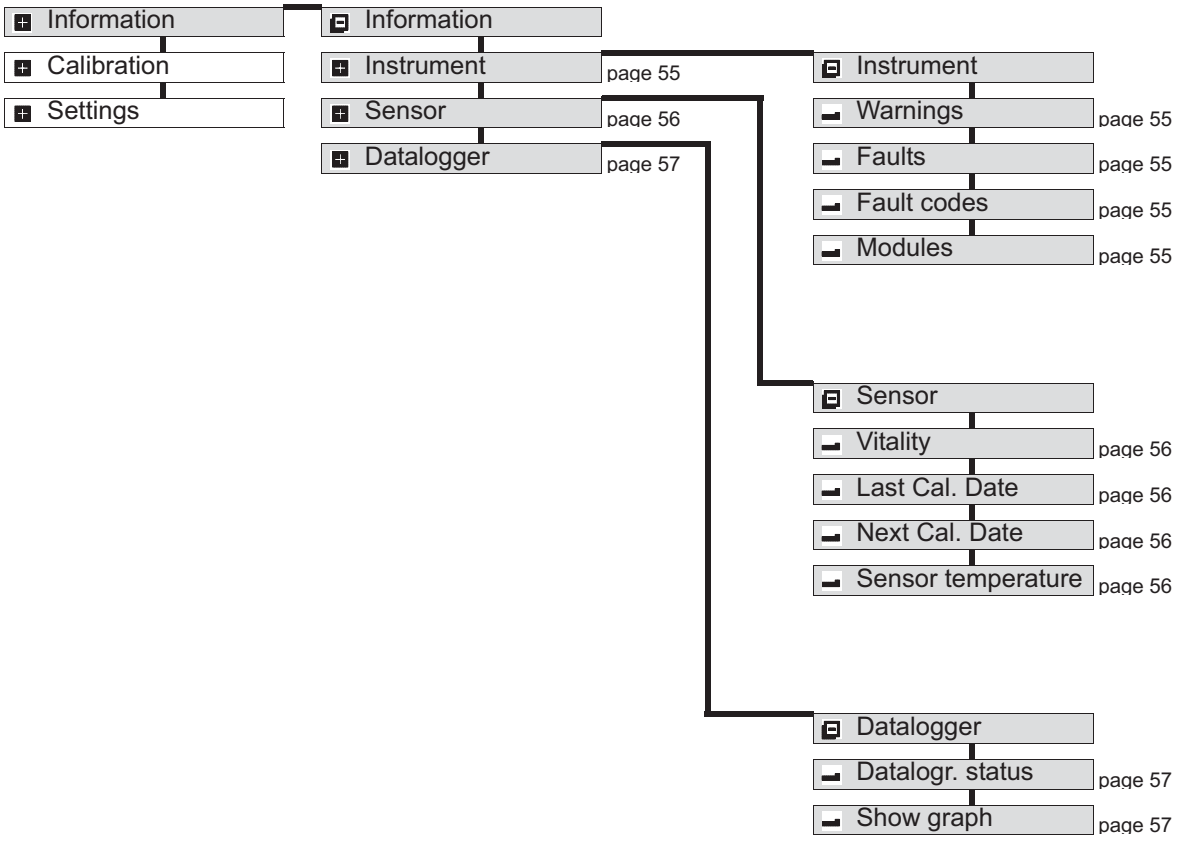
3/3
Number of current screen / total number of screens within the function.

2/2
Input
— Data input with the » ▲ « and » ▼ « keys.

The menu » Information «

The menu » Information « contains all information about the unit status, the sensors and the Datalogger.

Overview



Submenu » Instrument «

The submenu » Instrument Info « contains all functions for interrogating the unit status.

Warnings

— This function displays any existing warnings in clear text with the warning number, see page 49.
The icon » ⚠ « is displayed if any warnings are active.

- Select the menu items » Information «, » Instrument « and » Warnings « in this order, pressing the » OK « key after each selection.

— Any existing warnings are displayed in clear text.
If more than one warning exists, the number of the currently displayed warning and the total number of warnings are displayed in the top right corner (example: 1/3 = screen 1 of 3).

Faults

— This function displays any existing faults in clear text with the error number, see page 48.
If a fault code exists, the icon » ✕ « is displayed.

- Select the menu items » Information «, » Instrument « and » Faults « in this order, pressing the » OK « key after each selection.

— Any existing faults are displayed in clear text.
If more than one fault exists, the number of the currently displayed fault and the total number of faults are displayed in the top right corner (example: 1/2 = screen 1 of 2).

Fault codes

— This function displays any existing faults / warning codes in the form of a table.
If a fault code exists, the icon » ✕ « is displayed.

- Select the menu items » Information «, » Instrument « and » Fault codes « in this order, pressing the » OK « key after each selection.

— Any existing faults are displayed in the form of numerical codes in a table.
If all numerical groups are displayed with the value » 00 «, no faults exist.

Modules

— All installed hardware modules are displayed.

- Select the menu items » Information «, » Instrument « and » Modules « in this order, pressing the » OK « key after each selection.

— A list of all possible modules is displayed. The installed modules are indicated by a » ■ «. Modules which are not installed are marked with a » □ «.

- Use the » ▲ « and » ▼ « keys to select individual modules and press the » OK « key to display more detailed information.

Submenu » Sensor «

The submenu » Sensor « contains the functions for interrogating the sensor status.

Sensor vitality

This function is active only if the Polytron 7000 transmitter is equipped with the sensor diagnostic dongle, see page 30.

— This function displays the remaining sensitivity of the sensor.

- Select the menu items » Information «, » Sensor « and » Vitality « in this order, pressing the » OK « key after each selection.

— The current Sensor Vitality is displayed.

— Dräger Safety recommends that the sensor is exchange when the Sensor Vitality value is less than 25.

Last calibration date

— This function displays the date of the last calibration.

- Select the menu items » Information «, » Sensor « and » Last cal. date « in this order, pressing the » OK « key after each selection.

— The date of the last calibration is displayed.

Next calibration date

— This function displays the date on which calibration is next due.

- Select the menu items » Information «, » Sensor « and » Next cal. date « in this order, pressing the » OK « key after each selection.

— The date on which the sensor is next due for calibration is displayed.

Sensor temperature

— This function displays the current sensor temperature and the maximum sensor temperature which has been recorded.

- Select the menu items » Information «, » Sensor « and » Show sensortemp. « in this order, pressing the » OK « key after each selection.

— The current sensor temperature and the maximum sensor temperature which has been recorded are displayed.

Submenu » Datalogger «

The submenu » Datalogger « contains the functions for interrogating the Datalogger.

Datalogger status

This function is active only if the Polytron 7000 transmitter is equipped with the data dongle 83 17 618, see page 30.

— This function displays the status of the Datalogger and the Eventlogger.

- Select the menu items » Information «, » Datalogger « and » Datalogr status « in this order, pressing the » OK « key after each selection.

— The current status of the Datalogger and the Eventlogger is displayed:
  Datalogr. : on or off (the Datalogger is on or off)
  Evntlogr. : on or off (the Eventlogger is on or off)

— Activating / deactivating the Datalogger: see page 79.
— Activating / deactivating the Eventlogger: see page 79.

Show graph

This function is active only if the Polytron 7000 transmitter is equipped with the data dongle 83 17 618, see page 30.

— The measured values of the sensor are displayed graphically on a time axis of 15 minutes.

- Select the menu items » Information «, » Datalogger « and » Show graph « in this order, pressing the » OK « key after each selection.

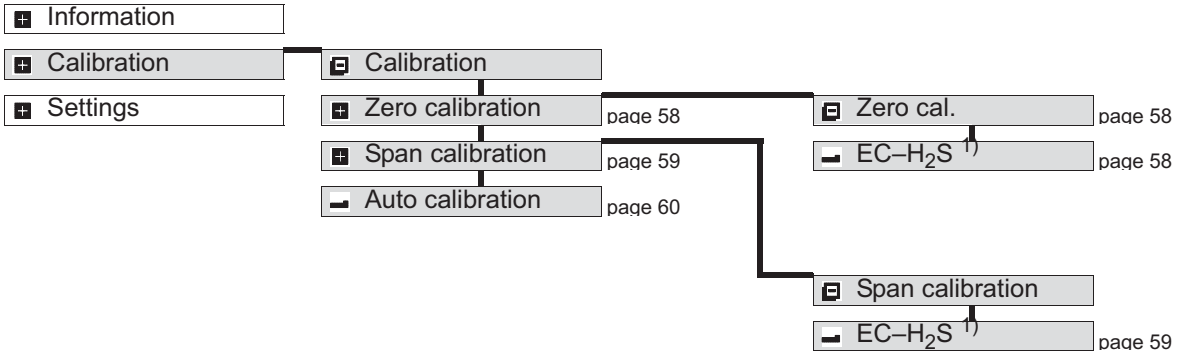
The menu » Calibration «

The menu » Calibration « contains all functions needed for the calibration and adjustment of the installed sensor.

Notes on handling the calibration gas and calibration accessories can be found in the section "Maintenance" on page 44.

If the calibration functions have not been operated for 60 minutes, the device will switch back to the measuring mode.

Overview



1) The sensor shown in the overview serves only as an example and may differ from the sensor actually installed in the unit.

Submenu » Zero calibration «

The submenu » Zero calibration « contains the functions for calibrating / adjusting the zero point of the installed sensor.

Zero-point calibration / adjustment

Calibration procedure (using an EC–H_2S sensor as an example):

- Select the menu items » Calibration «, » Zero calibration « and » EC–H_2S « in this order, pressing the » OK « key after each selection.

— The maintenance signal is transmitted on the analogue interface.
— The alarm and fault relays are not triggered.
— The message » Supply zero gas with flow rate 500 mL/min" is displayed

- Connect zero gas to the sensor (for some sensors, N_2 must be used – see information in the section "Maintenance" on page 44).
- Select » Next « and press the » OK « key.

— The current value and the expired time are now displayed.
When the displayed value has stabilised:

- Select » Accept value « and press the » OK « key.

— The message » Zero calibration running « is displayed

— The required value and the actual value are now displayed.
If these are correct as displayed:

- Select » Back to menu « and press the » OK « key.
- Disconnect the flow of zero gas.

Zero-point calibration can be aborted at any time:
- Use the » ▲ « key to move to » Back « and press the » OK « key.

Submenu » Span cal. «

The submenu » Span cal. « Contains all functions for calibrating the sensitivity of the installed sensor.

Sensitivity calibration

Calibration procedure (using an EC–H_2S sensor as an example):
- Select the menu items » Calibration «, » Span calibration « and » EC–H_2S « in this order, pressing the » OK « key after each selection.

— The maintenance signal is transmitted on the analogue interface.
— The alarm and fault relays are not triggered.
— The values for the calibration gas are displayed, for example:

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

— The calibration gas, concentration and unit can be changed:
- Select » Cal. gas « and press the » OK « key. Select the desired calibration gas from the list and press the » OK « key again.

- Select » Concentr. « and press the » OK « key. Set the calibration gas concentration (same procedure as for input of a password).

- Select » Unit « and press the » OK « key: Select the desired unit from the list and press the » OK « key again.

If the settings agree with the available calibration gas:
- Select » Next « and press the » OK « key.

— The message » Supply gas: H_2S with flow rate 500 ml/min « is displayed.
— Connect calibration gas (see the information in the section "Maintenance" on page 44) to the sensor.
- Select » Next « and press the » OK « key.

— The current value and the expired time are now displayed.
When the displayed value has stabilised:
- Select » Accept value « and press the » OK « key.

— In the display the maximum value and the current value as well as the remainder of the sensor vitality are represented as a bar indication.

If these are correct as displayed:
- Select » Next « and press the » OK « key.
- Disconnect the flow of calibration gas.

⚠ CAUTION
An alarm could be triggered in the central unit for as long as the calibration gas concentration is pending!

— The calibration interval and the date of the next calibration are displayed.
- Select » Back to menu « and press the » OK « key.

Sensitivity calibration can be aborted at any time:
- Use the » ▲ « key to move to » Back « and press the » OK « key.

Autocalibration

Autocalibration consists of fresh-air calibration followed by sensitivity calibration. This function is intended only for users who are familiar with the unit, since the sequence of actions may result in calibration errors.
The function can be activated or deactivated with the menu sequence » Settings «, » Sensor «, » Autocal. «.

Calibration procedure (using an EC-H_2S sensor as an example):
- Select the menu items "Calibration" and "Autocal." in this order, pressing the » OK « key after each selection.

⚠ CAUTION
The sensor must be supplied with fresh air, otherwise calibration errors may occur!

— The maintenance signal is transmitted on the analogue interface.

— The message » Fresh-air calibration running « is displayed.
- Expose the sensor to the ambient air (for some sensors, a zero gas such as N_2 must be used – see the information in the section "Maintenance" on page 44).
  Then:

— The values for the calibration gas are then displayed, for example:
  Cal. gas : H_2S
  Unit : ppm
  Concentr. : 000025

— The current value and the calibration gas concentration are now displayed.

The calibration operation depends on whether the selected calibration gas supports so-called autostability.

— **Autostability is supported:**
  When the displayed value has stabilised:
- Select » Accept value « and press the » OK « key.

— **Autostability is not supported:**
  The instrument evaluates the stability of the signal and automatically executes the calibration procedure.

— The required value and the actual value are now displayed.

- Disconnect the flow of calibration gas.

⚠ CAUTION
An alarm could be triggered in the central unit for as long as the calibration gas concentration is pending!

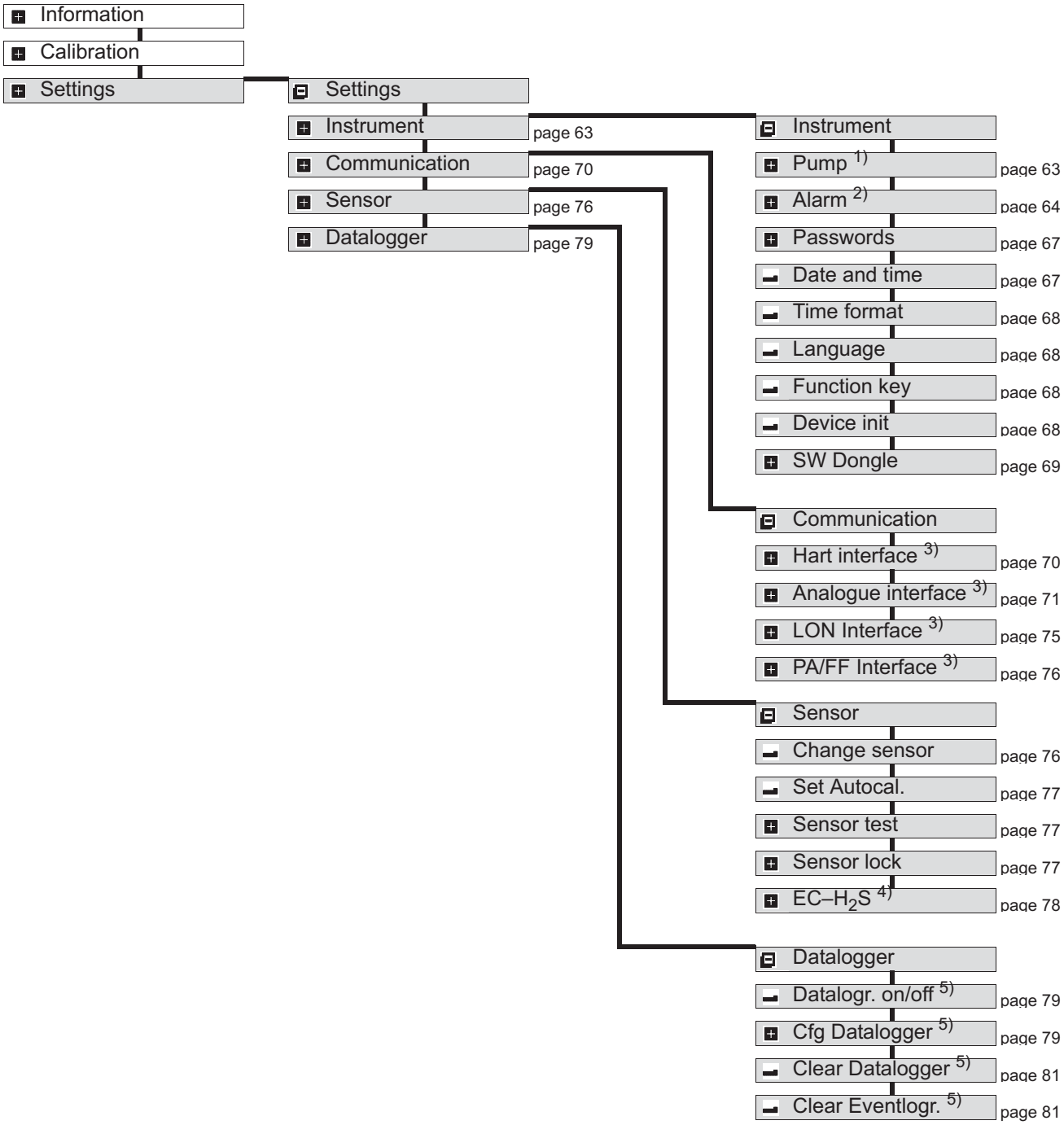
If these are correct as displayed:

- Select » Accept value « and press the » OK « key.

The menu » Settings «

The menu » Settings « contains all functions needed for individual configuration of the unit.

Overview



1) This menu function can be executed only if the Polytron 7000 transmitter is equipped with a pump module, see page 34.
2) This menu function can be executed only if the Polytron 7000 transmitter is equipped with a relay module, see page 32.
3) This menu function can be executed only if the Polytron 7000 transmitter is equipped with the appropriate interface card.
4) The sensor shown in the overview serves only as an example and may differ from the sensor actually installed in the unit.
5) This menu function can be executed only if the Polytron 7000 transmitter is equipped with the data dongle 83 17 618, see page 30.

Submenu » Instrument «

The submenu » Instrument « can be used to make various instrument settings.

Pump

This group contains the setting functions for the pump.

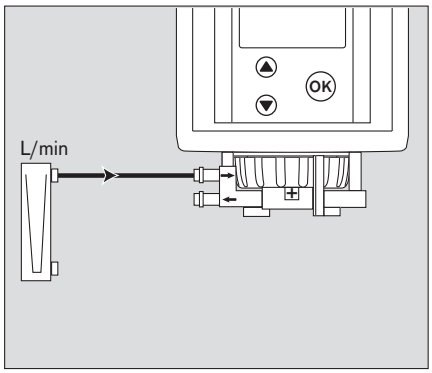
– Pump output

— This function is used to set the pump output.

- Select the menu items » Settings «, » Instrument «, » Pump « and » Pump output « in this order, pressing the » OK « key after each selection.

— The maintenance signal is transmitted on the analogue interface, and the display reads: » Flow alarm will be de-energised. Please use a flow meter «.

- Connect a pump adapter and a flowmeter.



- Select » Next « and press the » OK « key.
- Use the » ▲ « and » ▼ « keys to set the pump output. Monitor the change on the flowmeter.

NOTE
Choose the response time as low as possible and the pump output as high as possible.

- Select » Next « and press the » OK « key.

— The flow thresholds are displayed –
Flow threshold for fault: 0.3 L/min
Flow threshold for warning: 0.4 L/min

– Operating time

— This function is used to display the operating time of the pump.
- Select the menu items » Settings «, » Instrument «, » Pump « and » Operating time « in this order, pressing the » OK « key after each selection.

— The actual operating time of the pump is displayed in hours.

Alarm / Relay settings

Alarms can be output via a relay and a digital interface if a relay module is installed. This group contains the setting functions for the alarms.

⚠ CAUTION
In the normal state, the relays of the relay module are energised. Therefore, the state of the relay changes if the power supply is interrupted!

– Alarm on/off

— This function is used to enable and disable alarm monitoring.
- Select the menu items » Settings «, » Instrument «, » Alarm « and » Alarm on/off « in this order, pressing the » OK « key after each selection.

- Select » Enable « or » Disable « and press the » OK « key to activate.

⚠ CAUTION
If the alarm is disabled, no alarms will be signalled via the relay or the HART interface! A warning » ! « appears on the display!

– Set alarm A1

— This function is used to change the alarm configuration for alarm A1.
- Select the menu items » Settings «, » Instrument «, » Alarm « and « alarm A1 « in this order, pressing the » OK « key after each selection.

- Use the » ▲ « and » ▼ « keys to set each position of the threshold value for the alarm A1 and press the » OK « key to confirm the setting.
- Press the » OK « key to confirm the complete alarm threshold value. The setting for the alarm threshold A1 is displayed.

— The function for setting the alarm direction is opened.
- Select » Rising « or » Falling « and press the » OK « key to activate your selection.
- Select » Next « and press the » OK « key.

— The function for setting the self-hold function of the A1 alarm is opened.
- Select » Latching « or » Non latching « and press the » OK « key to activate.
- Select » Next « and press the » OK « key.
  Note: » Latching « means that the relay must be manually acknowledged after the alarm condition is no longer fulfilled, » Non latching « means that the relay is automatically acknowledged after the alarm condition is no longer fulfilled.

— The function for setting the A1 acknowledgement is opened.

- Select » Can be acknowledged « or » Cannot be acknowledged « and press the » OK « key to activate.
  Note: » Can be acknowledged « means that the relay can be reset when the alarm condition is fulfilled. » Cannot be acknowledged « means that the relay can only be reset after the alarm condition is no longer fulfilled.

⚠ CAUTION
If an alarm has been configured as » Can be acknowledged «, it can also be reset when the alarm condition is fulfilled. In the case of safety-relevant switching operations, the alarm must be configured as » Cannot be can be acknowledged «.

Overview of alarm settings

		Alarm condition fulfilled			Alarm condition not fulfilled	
Alarm configuration		Acknowledgement button actuated	Acknowledgement button not actuated		Acknowledgement button actuated	Acknowledgement button not actuated
Latching	Can be acknowledged	Alarm deactivated	Alarm activated		Alarm deactivated	Alarm activated
	Cannot be acknowledged	Alarm activated	Alarm activated		Alarm deactivated	Alarm activated
Non latching	Can be acknowledged	Alarm deactivated	Alarm activated			Alarm is automatically deactivated when condition is no longer fulfilled
	Cannot be acknowledged	Alarm activated	Alarm activated		Alarm is automatically deactivated when condition is no longer fulfilled	Alarm is automatically deactivated when condition is no longer fulfilled

— The function for setting the A1 hysteresis is opened.
  This function allows the user to set a bandwidth in which a tripped relay stays in its status until the gas concentration is outside this bandwidth. With this function relays will not "chatter" at the alarm set point. E.g. A1 set point is 40 ppm, hysteresis is set to 3 ppm. Alarm A1 will come on at 40 ppm and will stay active until the concentration falls below 37 ppm.
- Select the line for input of the hysteresis and press the » OK « key to switch to edit mode.
- Use the » ▲ « and » ▼ « keys to set each digit of the value and press the » OK « key to confirm the setting.
- Select » Next « and press the » OK « key.

— The settings of the A1 are indicated.
- To confirm select » Confirm « and press the » OK « key.

— The settings for alarm A1 are now complete.

– Set alarm A2

— This function is used to change the alarm configuration for alarm A2.

- Select the menu items "Settings «, "Instrument «, "Alarm « and "alarm A2 « in this order, pressing the » OK « key after each selection

— The settings are made in the same manner as for alarm A1.

– Set ack.

— This function is used to enable or disable the acknowledgement of the alarms with the » OK « key.

- Select the menu items » Settings «, » Instrument «, » Alarm « and » Set ack. « in this order, pressing the » OK « key after each selection.

- Select » Enable « or » Disable « and press the » OK « key to activate.

⚠ CAUTION
If the functions » Disable acknowledgement « and » Alarm setting latching « are combined, an alarm can only be acknowledged by interrupting the power supply of the Polytron 7000 transmitter! If an alarm has been configured as » Can be acknowledged «, it can also be reset when the alarm condition is fulfilled. In the case of safety-relevant switching operations, the alarm must be configured as » Cannot be acknowledged «.

– Test alarm A1

— This function simulates the A1 alarm state for testing purposes.

- Select the menu items » Settings «, » Instrument «, » Alarm « and » Test alarm A1 « in this order, pressing the » OK « key after each selection.

— The function » Test A1 status « is opened.

- Select » Enable « or » Disable « and press the » OK « key to activate.

— When the function is enabled, the relay and the interfaces are set to the A1 alarm state.

– Test alarm A2

— This function simulates the A2 alarm state for testing purposes.

- Select the menu items » Settings «, » Instrument «, » Alarm « and » Test alarm A2 « in this order, pressing the » OK « key after each selection.

— The function » Test A2 status « is opened.

- Select » Enable « or » Disable « and press the » OK « key to activate.

— When the function is enabled, the relay and the interfaces are set to the A2 alarm state.

– Test fault

— This function simulates the fault alarm state for testing purposes.

- Select the menu items » Settings «, » Instrument «, » Alarm « and » Test fault alarm « in this order, pressing the » OK « key after each selection.

— The function » Test fault status « is opened.

- Select » Enable « or » Disable « and press the » OK « key to activate.

— When the function is enabled, the relay and the interfaces are set to the fault alarm state.

Passwords

This group contains the setting functions for the passwords.

– Password Calibration

— This function is used to change the password for the menu » Calibration «.

- Select the menu items » Settings «, » Instrument «, » Passwords « and » Password Cal. « in this order, pressing the » OK « key after each selection.

- Select the line for password input and press the » OK « key to switch to edit mode.
- Use the » ▲ « and » ▼ « keys to set each position of the password and press the » OK « key to confirm the setting.
- Press the » OK « key to confirm the complete password.

– Password Settings

— This function is used to change the password for the menu » Settings «.

- Select the menu items » Settings «, » Instrument «, » Passwords « and » Password Cfg. « in this order, pressing the » OK « key after each selection.

- Select the line for password input and press the » OK « key to switch to edit mode.
- Use the » ▲ « and » ▼ « keys to set each position of the password and press the » OK « key to confirm the setting.
- Press the » OK « key to confirm the complete password.

Date and time

— This function is used to set the date and / or time.

- Select the menu items « Settings «, « Instrument « and « Date and time « in this order, pressing the » OK « key after each selection.

- Select the desired input line (Date or Time) and press the » OK « key to switch to edit mode.

- Use the » ▲ « and » ▼ « keys to set the value and press the » OK « key to confirm the setting.

Time format

— This function is used to set the display format for the date and/or time.

- Select the menu items « Settings «, « Instrument « and « Time format « in this order, pressing the » OK « key after each selection.
- Select the desired input line (Date format or Time format) and press the » OK « key to switch to edit mode.
- Use the » ▲ « and » ▼ « keys to select the desired format (European or US) and press the » OK « key to confirm the setting.

Language

— This function is used to set the language for the menus.

- Select the menu items « Settings «, « Instrument « and « Language « in this order, pressing the » OK « key after each selection.
- Select the desired language from the list and press the » OK « key to activate.

Function key

— This function is used to set the function which is to be activated when the function key (the » ▲ « key) is pressed briefly.
Default setting: Fault report.

- Select the menu items » Settings «, » Instrument « and » Function key « in this order, pressing the » OK « key after each selection.
- Select the desired function and press the » OK « key to activate. An icon corresponding to the selected function appear on the right side of the display. Possible selections:

  Show graph – the measured values are displayed on a time axis, see page 57

  Fault report – existing faults are displayed in clear text, see page 55

  Notice report – existing warnings are displayed in clear text, see page 55

  Fault codes – existing fault codes are displayed in a numerical table, see page 55

— In measuring mode, briefly pressing the » ▲ « key will now activate the selected function.

Initialise device

This function resets all parameters of the transmitter to the factory default settings.
This affects the following parameters:
— Sensor lock.
— Gas selection (if the sensor is suitable for measuring several different gases).
— Units in the measured value display (normally ppm).
— Measuring range for the 4 to 20 mA interface.
— Gas configuration of the calibration gas (if the sensor is suitable for calibration with a replacement gas).
— Calibration interval The sensor-specific default values can be found in the related sensor data sheet.

It also affects the setting parameters for:
— Pump output
— Alarm parameters
— Passwords
— Language
— Function key
— HART interface
— Datalogger
— Analogue interface

- Select the menu items » Settings «, » Instrument « and » Device init. « in this order, pressing the » OK « key after each selection.

- Select » Confirm « and press the » OK « key to initialise the device.

SW dongle

This group permits the deactivation of individual dongles before they are removed or in the case of a fault in a dongle.
A dongle can be reactivated only by restarting the unit.

– Data dongle
- Select the menu items » Settings «, » Instrument «, » SW dongle « and » Data dongle « in this order, pressing the » OK « key after each selection.

- Select the line » Disable function « and press the » OK « key to disable the data dongle.

– Sensor test dongle
- Select the menu items » Settings «, » Instrument «, » SW dongle « and » Sensor test dongle « in this order, pressing the » OK « key after each selection.

- Select the line » Disable function « and press the » OK « key to disable the sensor test dongle.

– Diagnosis dongle
- Select the menu items » Settings «, » Instrument «, » SW dongle « and » Diagnosis dongle « in this order, pressing the » OK « key after each selection.

- Select the line » Disable function « and press the » OK « key to disable the diagnosis dongle.

Submenu » Communication «

The submenu » Communication « permits various settings to by made for the interfaces.

HART interface

This group contains the setting functions for the HART interface.

– Polling address

The polling address configures the transmitter either for the analogue mode (4 to 20 mA) or the multidrop mode. Setting the polling address to " 0 " enables the analogue mode (4 to 20 mA). To enter multidrop mode, the polling address must be set to a value in the range from " 1 " to " 15 ", which disables the analogue interface and freezes it to a constant current of approx. 3 mA. In order to enable the central controller to request the unique identifier (unambiguous HART address) using HART command #0, all transmitters located on one cable trunk need to be configured with a different polling address. It is best to assign sequential polling addresses, starting with "1".
This setting corresponds to the HART command #6 ("Write Polling Address").

- Select the menu items » Settings «, » Communication «, » Hart interface « and » Polling address « in this order, pressing the » OK « key after each selection.

- Use the » ▲ « and » ▼ « keys to set each position of the polling address and press the » OK « key to confirm the setting.

- Press the » OK « key to confirm the complete polling address.

– Unique Identifier

This function can be used to read out the unique identifier (unique HART address), which must be known for the addressing in almost all HART commands. However, knowledge of the unique identifier is necessary only for systems which are not able to read out the unique identifier with the HART command #0 in the short-frame format or the HART command #11. The display corresponds to the address returned by the HART command #0 ("Read Unique Identifier") or #11 ("Read Unique Identifier associated with Tag").

- Select the menu items » Settings «, » Communication «, » Hart interface « and » Identifier « in this order, pressing the » OK « key after each selection.

— The unique identifier will be displayed.

– Tag

The tag may be used to mark a specific transmitter. It can comprise up to 8 alphanumeric characters. It can also serve as an address, in order to read the unique identifier using HART command #11 ("Read Unique Identifier associated with Tag"), from the transmitter, even if the polling address is unknown.
This presumes that an unambiguous tag has been configured before.

- Select the menu items » Settings «, » Communication «, » Hart interface « and » Tag « in this order, pressing the » OK « key after each selection.
- Use the » ▲ « and » ▼ « keys to set each position of the tag and press the » OK « key to confirm the setting.
- Press the » OK « key to confirm the complete tag.

Analogue interface

This group contains the functions needed for the test and setting functions.

Settings for the analogue interface

– Analogue set point / Set measurement range

When the measuring range of the analogue interface must be adjusted.
Here corresponds: 0 ppm = 4 mA; Analogue signal = 20 mA
— According to the standard, the standard measuring range of the sensor automatically ends here.

– Warning on/off

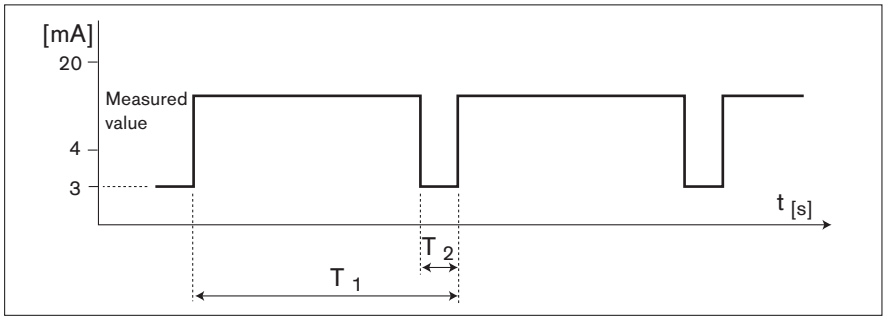
This function is used to switch the warning signal » ! « on the analogue interface on and off. If the presence of a warning is to be signalled via the analogue interface, the warning signal must be switched on. In the case of a warning, the current on the analogue interface is switched for one second to the state "Warning". For the rest of the time, the measured signal is transmitted. The interval between the warning signals and the level of the analogue signal can be configured as desired, see "Warning signal" on page 72 and "Warning level" on page 72.

- Select the menu items » Settings «, » Communication «, » Analogue interface « and » Warning on/off « in this order, pressing the » OK « key after each selection.
- Select » Enable « or » Disable « and press the » OK « key to activate.

– Warning interval

This function is used to set the interval between the warning signals » ⚠ « on the analogue interface.

- Select the menu items » Settings «, » Communication «, » Analogue interface « and » Warning interval « in this order, pressing the » OK « key after each selection.
- Use the » ▲ « and » ▼ « keys to set each position of the time interval (in seconds) for T_1 and T_2 and press the » OK « key to confirm the setting.



- Press the » OK « key to confirm the complete time interval.

– Warning level

— This function is used to set the current on the analogue interface for the warning signal » ⚠ «.

- Select the menu items » Settings «, » Communication «, » Analogue interface « and » Warning level « in this order, pressing the » OK « key after each selection.
- Use the » ▲ « and » ▼ « keys to set each position of the current value and press the » OK « key to confirm the setting.

- Press the » OK « key to confirm the complete current value.

– Maintenance signal

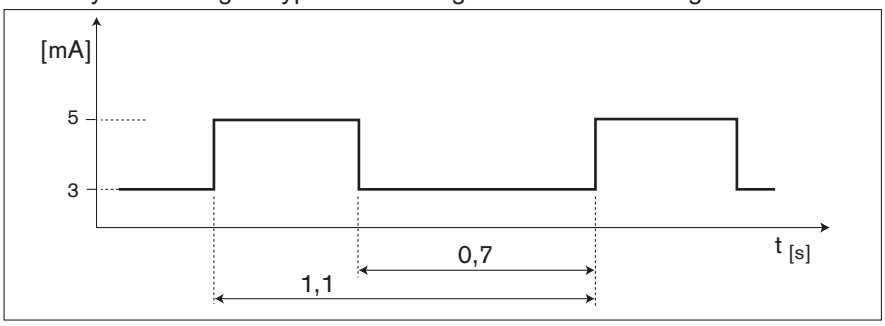
— This function is used to set the signal type on the analogue interface for the maintenance signal » 🔧 «.

- Select the menu items » Settings «, » Communication «, » Analogue interface « and » Maintenance signal « in this order, pressing the » OK « key after each
  selection.

- Select the » static « or » dynamic signal type, as required, and activate it by pressing the » OK « key.

Note:
The » static « signal type is a DC current signal whose current value can be configured (see » Maintenance level «).

The » dynamic « signal type is an AC signal with the following characteristic:



– Maintenance level

— This function is used to set the current on the analogue interface for the maintenance signal » 🔧 «.

- Select the menu items » Settings «, » Communication «, » Analogue interface « and » Warning level « in this order, pressing the » OK « key after each selection.
- Use the » ▲ « and » ▼ « keys to set each position of the current value and press the » OK « key to confirm the setting.

- Press the » OK « key to confirm the complete current value.

– Offset current

— Provides for the adjustment of the zero point signal (4 mA signal).
- Select » Settings «, » Communication «, » Analogue interface « and » Offset current « in this order, pressing the » OK « key after each selection.
- Use the » ▼ « key for marking the input value for the current value and select it with the » OK « key.
- Use the » ▲ « or » ▼ « keys for selecting the desired sign (+/-) for the input.
- By pressing the » OK « key, select the desired input field and enter the desired current correction value with the » ▲ « or » ▼ « keys. A maximum input of +/- 0,500 mA of the factory-preset 4 mA current value is possible.
- Press the »« OK key to confirm the completely adjusted current value.

Test functions for the analogue interface

– Test analogue

— This function is used to set various currents in the range 3 to 22 mA on the analogue interface.

NOTE
These functions may trigger alarms in the control unit! If necessary, the alarms should be disabled in the control unit before using the functions.

- Select the menu items » Settings «, » Communication «, » Analogue interface « and » Test analogue « in this order, pressing the » OK « key after each selection.
- If the alarms are disabled in the control unit, confirm the message » Switch off all alarms « by pressing the » OK « key.

- Use the » ▲ « and » ▼ « keys to set each position of the current value and press the » OK « key to confirm the setting.

- Use the »» ▲ « and » ▼ « keys to select the state » Set current output « and press the » OK « key to activate.

— The selected current is transmitted on the analogue interface.

- Use the » ▲ « and » ▼ « keys to select the line » Next « and press the » OK « key to confirm the selection. The function is terminated.
- When the alarms in the control unit have been enabled again, confirm the message » Switch on all alarms « by pressing the » OK « key.

– Test fault

— This function is used to set the analogue interface to the fault signal » ☒ «.

NOTE
These functions may trigger alarms in the control unit! If necessary, the alarms should be disabled in the control unit before using the functions.

- Select the menu items » Settings «, » Communication «, » Analogue interface « and » Test fault « in this order, pressing the » OK « key after each selection.

- Use the » ▲ « and » ▼ « keys to select » Enable « and press the » OK « key to activate.

— The current for the fault signal is transmitted on the analogue interface.

- Use the » ▲ « and » ▼ « keys to select » Disable « and press the » OK « key to activate.

— The current for the fault signal is switched off.

– Test warning

— This function is used to set the analogue interface to the warning signal » ⚠ «.

NOTE
These functions may trigger alarms in the control unit! If necessary, the alarms should be disabled in the control unit before using the functions.

- Select the menu items » Settings «, » Communication «, » Analogue interface « and » Test warning « in this order, pressing the » OK « key after each selection.
- Use the » ▲ « and » ▼ « keys to select » Enable « and press the » OK « key to activate.

— The current for the warning signal is transmitted on the analogue interface.

- Use the » ▲ « and » ▼ « keys to select » Disable « and press the » OK « key to activate.

— The current for the warning signal is switched off.

– Test maintenance

— This function is used to set the analogue interface to the maintenance signal » 🔧 «.

NOTE
These functions may trigger alarms in the control unit! If necessary, the alarms should be disabled in the control unit before using the functions.

- Select the menu items » Settings «, » Communication «, » Analogue interface « and » Test maintenance « in this order, pressing the » OK « key after each selection.

- Use the » ▲ « and » ▼ « keys to select » Enable « and press the » OK « key to activate.

— The current for the maintenance signal is transmitted on the analogue interface.

- Use the » ▲ « and » ▼ « keys to select » Disable « and press the » OK « key to activate.

— The current for the maintenance signal is switched off.

LON Interface

This function group contains the functions for the LON interface. For details of operation with LON, see also “Polytron 7000 Operation via LON” on page 82.

– Neuron ID

Every Polytron 7000 has a Neuron ID. The Neuron ID uniquely defines the Neuron chip on the LON network.
To display the Neuron ID:

- Select the menu items » Settings «, » Communication «, » LON Interface « and » Neuron ID «, pressing the » OK « key after each selection.

— The Neuron ID is displayed.

– Service PIN

The Polytron 7000 can be commissioned by sending its Neuron ID to the LON network with the aid of the function "Service PIN".

- Select the menu items » Settings «, » Communication «, » LON Interface « and » Service PIN « pressing the » OK « key after each selection.

- Use the » ▲ « and » ▼ « to select » Confirm « and press the » OK « key to activate this selection.

— The Neuron ID of the Polytron 7000 is transmitted.

PA/FF interface

Provides for the address distribution for the Profibus PA interface.

- Select » Settings «, » Communication «, » PA/FF Interface « and » PA address « in this order, pressing the » OK « key after each selection.
- Select the line for the address input by using the » ▼ « key and confirm with the » OK « key.
- Address entry by pressing the » OK « key for selecting the desired position of the input position with subsequent address entry (range 1-126) by pressing the » ▲ « or » ▼ « keys.
- Confirm adjusted address with the » OK « key.

Submenu » Sensor «

The submenu » Sensor « can be used to make various settings for the installed sensor.

Change sensor

— This function can be used to change a sensor while the unit is running without sending a fault alarm to the control unit. It also ensures that all sensor data currently in the microprocessor can be saved to the EEPROM of the sensor before the sensor plug is disconnected.

— In principle, a sensor can be replaced at any time. However, for technical safety reasons, a fault alarm will be activated until a new sensor is connected, in case a sensor is disconnected accidentally.

- Select the menu items » Settings «, » Sensor « and » Change sensor « in this order, pressing the » OK « key after each selection.

— The maintenance signal is transmitted on the analogue interface, and the display reads: » Please remove sensor«.

- Remove the old sensor and plug in the new one (see page 46).
  When the new sensor has been installed:
- The message » Loading database, please wait « is displayed.

  When the sensor data have been loaded:

— The message » Database is loaded « is displayed.

- Select » Back to menu « and press the » OK « key.

— The maintenance signal on the analogue interface remains until the sensor operates normally.
  The duration of the warming-up period depends on the type of sensor and its history. If, for example, the sensor had already been warmed up on another transmitter and it was disconnected only for a short time, the warming-up period may be shorter than that shown in the operating instructions for the sensor.
  See the operating instructions for the sensor for the maximum warming-up period.
  If the old sensor is replaced with an identical sensor (with the same Part No.), the configuration of the transmitters (gas type, measuring range, calibration gas, calibration interval) remains unchanged.
  Otherwise, the default values for the sensor (see the operating instructions

for the sensor) are used by the transmitter if the sensor-lock function (page 77) is disabled.

Autocalibration setting

— This function is used to enable and disable the autocalibration (page 60).

- Select the menu items » Settings «, » Sensor « and » Set autocal. « in this order, pressing the » OK « key after each selection.
- Select » Enable « or » Disable « and press the » OK « key to activate.

— Autocalibration from the menu "Calibration" can be used only if this function is enabled.

Sensor test

This group contains the setting functions for the sensor selftest.
These functions can be used only if the Polytron 7000 transmitter is equipped with the Sensor Dongle 83 17 619 or the Sensor Diagnostic Dongle 83 17 860, see page 30.

– Sensor test setting

— This function can be used to activate or reactivate the sensor selftest.

- Select the menu items « Settings «, « Sensor « and « Set sensor test « in this order, pressing the » OK « key after each selection.

- Use the » ▲ « and » ▼ « keys to select « Enable « or « Disable « and press the » OK « key to activate.

— If the sensor selftest is enabled, the transmitter continually tests the sensor in order to ensure reliable operation. If the sensor does not pass the selftest, a suitable warning or fault is generated.

– Sensor self-test

— This function is used to start the sensor self-test.

- Select the menu items « Settings «, « Sensor «, » ECXX « and « Sensor self-test «.
- If a sensor self-test can be executed (depending on sensor or device status): Use » ▼ « to select » Start sensor self-test «, then press » OK « button to start.

— After a few seconds the result is indicated in the display.

To terminate the function:

- Select » Back to menu « and press the » OK « key.

– Sensor lock

— This function is used to enable or disable the sensor lock.

- Select the menu items » Settings «, » Sensor « , « EC–O_2 « and » Sensor lock « in this order, pressing the » OK « key after each selection.

- Select » Enable « or » Disable « and press the » OK « key to activate.

Enable	=	The transmitter will accept a new sensor only if it has the same Part No. (=Dräger Order No.) as the old sensor and thus the same sensor type.
Disable	=	The transmitter will accept other sensor types. In this case, the transmitter uses the default settings for the new sensor, which means that the transmitter configuration will be changed.

Sensor configuration
(using an EC–O_2 sensor as an example):

This group contains the setting functions for the sensor.

– Gas setting

— This function is used to change the settings for the gas to be measured.

- Select the menu items » Settings «, » Sensor « , « EC–O_2 « and » Set gas « in this order, pressing the » OK « key after each selection.

When several measuring gases of the sensor are displayed:
- Use the » ▲ « and » ▼ « keys to select from the list of measuring gases and the » OK « key to activate.

— The selected gas is indicated.

- Use the » ▲ « and » ▼ « keys to select the unit of measurement (e.g. Vol.%) from the list and press the » OK « key to activate.

— The overview of the settings are displayed.

— If the settings are correct:
- Use the » ▼ « key to select the line » Confirm « and press the » OK « key.

– Sensor initialisation

— This function is used to set all parameters of the sensors back to the factory default values.

- Select the menu items » Settings «, » Sensor «, » EC–O_2 « and » Sensor init. « in this order, pressing the » OK « key after each selection.

- Select » Confirm « and press the » OK « key to initialise the sensor.

– Set calibration interval

— This function is used to set the calibration interval.

- Select the menu items » Settings «, » Sensor «, » EC–O_2 « and » Set cal. Int. « in this order, pressing the » OK « key after each selection.

- Use the » ▲ « and » ▼ « keys to set each position of the calibration interval (in days) and press the » OK « key to confirm the setting.
  To confirm the entered calibration interval:
- Select » Confirm « and press the » OK « key.

Submenu » Datalogger «

The submenu » Datalogger « permits various settings to be made for the Datalogger and the Eventlogger.
These functions are available only if the Polytron 7000 transmitter is equipped with the Data Dongle 83 17 618, see page 30.
The contents of the Datalogger or Eventlogger can be evaluated only with the PC software GasVision (Version 5.5 or higher). The contents of the Datalogger for the previous 15 minutes can be viewed with the menu sequence » Information «, » Datalogger « and » Show graph «, page 57.

Datalogger:
The Datalogger saves the measured values in accordance with the configuration set under » Set Datalogger «. The Datalogger can save at least 3000 measured values. If the data is saved at intervals of one minute, this is sufficient for a monitoring period of 50 hours. The monitoring period can be extended considerably by using the setting » Trigger « (page 80).

Eventlogger:
The Eventlogger saves unit and sensor events (such as: A1 threshold value exceeded; flow fault in pump). The Eventlogger can save a maximum of 100 events

Logger on/off

— This function is used to enable or disable the Data- or Eventlogger.

- Select the menu items » Settings «, » Datalogger « and » Datalgr. On/off « in this order, pressing the » OK « key after each selection.

- Select » Enable « or » Disable « and press the » OK « key to activate.

Datalogger setting

This group contains the setting functions for the Datalogger.

– Sample time

— This function can be used to set the sample time for the Datalogger.

- Select the menu items » Settings «, » Datalogger «, » Set Datalogger « and » Sample time « in this order, pressing the » OK « key after each selection.

- Select the desired sample time from the list and press the » OK « key to activate it (» ✔ «).

– Peak / average

— This function can be used to select whether the Datalogger is to save peak or average values.

- Select the menu items » Settings «, » Datalogger «, » Set Datalogger « and » Peak/average « in this order, pressing the » OK « key after each selection.
- Select » Peak « or » Average « and press the » OK « key to activate.

Peak	The maximum concentration value measured during the selected sample time is saved.
Average	The average of all concentration values measured during the selected sample time is saved.

– Trigger on/off

— This function can be used to enable or disable the threshold criterion for saving of concentration values.
— If this function is enabled and a suitable trigger value is selected, it is possible to monitor the measured values for a longer period.

- Select the menu items » Settings «, » Datalogger «, » Set Datalogger « and » Peak/average « in this order, pressing the » OK « key after each selection.
- Select » Enable « or » Disable « and press the » OK « key to activate.

Enable	Concentration values are saved only if they exceed the threshold set under » Trigger value « (referred to the previously saved value).
Disable	All measured values which occur during the sample time are saved.

– Trigger value

— This function can be used to set the trigger value.
This value refers proportionally to the whole measuring range.
Example: with a measuring range of 500 ppm a trigger value of 2 % is entered. Then the datalogger will only store measured values (refer to the last stored measured value) that deviate by more than 10 ppm.

- Select the menu items » Settings «, » Datalogger «, » Set Datalogger « and » Trigger value « in this order, pressing the » OK « key after each selection.
- Use the » ▲ « and » ▼ « keys to set each position of the trigger value and press the » OK « key to confirm the setting.
- Press the » OK « key to confirm the complete trigger value.

– Stack/roll

— This function can be used to set the operating mode of the Datalogger and the Eventlogger.

- Select the menu items » Settings «, » Datalogger «, » Set Datalogger « and » Stack/roll « in this order, pressing the » OK « key after each selection.
- Select » Stack « or » Roll « and press the » OK « key to activate (» ✔ «).

Roll	when the Datalogger storage space is use up, the oldest data will be overwritten first
Stack	when the Datalogger storage is full, no further data can be saved. An appropriate warning is generated.

Clear Datalogger

— This function is used to delete all data from the Datalogger.

- Select the menu items » Settings «, » Datalogger « and » Clear Datalogger « in this order, pressing the » OK « key after each selection.

— The message » Clear Datalogger data « is displayed.
- Use the » ▼ « key to select the line » Confirm « and press the » OK « key.

— The data are deleted from the Datalogger.

Clear Eventlogger

— This function is used to delete all data from the Eventlogger.

- Select the menu items » Settings «, » Datalogger « and » Clear Eventlogger « in this order, pressing the » OK « key after each selection.

— The message » Clear Eventlogger data « is displayed.
- Use the » ▼ « key to select the line » Confirm « and press the » OK « key.

— The data are deleted from the Eventlogger.

Polytron 7000 Operation via LON

There are 3 LED's behind the display window that indicate the different status of the Polytron 7000.
— The red LED indicates an error.
— The orange LED indicates communication with the central controller via LON of LON specific data e.g. sending the Service PIN.
— The green LED indicates the correct operation of the Polytron 7000 when it is continuously on.
When the green LED flashes it indicates a warning in the Polytron 7000.

Every Polytron 7000 has a Neuron ID. The Neuron ID uniquely defines the Neuron chip on the LON network.
To view the Neuron ID:
- Select menu items » Settings «, » Communication «, » LON Interface « and » Neuron ID «.

To commission the device the Neuron ID can be sent to the controller via LON using the Service PIN function.
- Select menu items » Settings «, » Communication «, » LON Interface « and » Service PIN «.
- Select » Confirm « and press the » OK « key to sent the Neuron ID.

Use the Polytron 7000 Plugin for configuration and commissioning the Polytron 7000 via LON.
The plugin is available for free download under:
http://www.echelon.com/products/integration/plugin/

Polytron 7000 Operation via Foundation Fieldbus

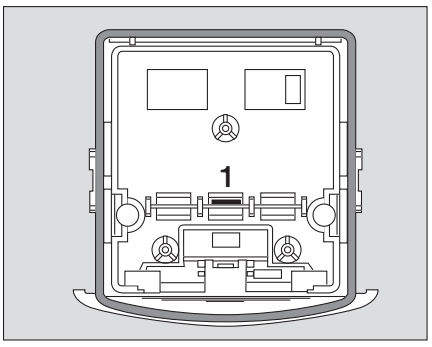
For the Polytron 7000, three support files are available: two device description files (FFO and SYM) and a capability file (CFF).

Use the Polytron 7xxx Foundation Fieldbus Manuel for configuration and commissioning the Polytron 7000 via LON.
The Manual is available for free download under: http://www.draeger.com

1 By connecting the Foundation Fieldbus jumper, the following Foundation Fieldbus functions are activated:

Simulate: If the Foundation Fieldbus jumper has been connected, the simulate function can be activated by SW or via the fieldbus. The fieldbus master then receives defined simulation values. This may be helpful when commissioning or maintaining the fieldbus system.

Writeprotect: If the Foundation Fieldbus jumper has been connected, all writeable parameters of the fieldbus transmitter can only be read. The jumper must be set during commissioning to enable parametrisation of the transmitter.



Polytron 7000 Operation via PROFIBUS PA

For the Polytron 7000 PROFIBUS PA transmitter, a GSD file and a DD file (for the SIMATIC PDM) are available.
For the Polytron 7000, a DTM is also available.

Use the Polytron 7xxx PROFIBUS PA Manual for configuration and commissioning the Polytron 7000.
The manual is available for free download under: http://www.draeger.com

Structure of primary value:

description:	quality		sub-status				limit value	
bits:	7	6	5	4	3	2	1	0

Primary value PROFIBUS PA and Foundation Fieldbus:

PRIMARY_VALUE Quality – The quality used will be determined by highest priority condition

Value Bit 7, 6	Name	Description
0	Bad	The value is not useful
1	Uncertain	The quality of the value is less than normal, but the value may still be useful.
2	Good (Non-cascade	The quality of the value is good. Possible alarm conditions may be indicated by the sub-status. Alarm indication is applies only to the PV and primary output parameters not in the cascade path.
3	Good (Cascade)	The value may be used in control.

BAD sub-status

Value Bit 5, 4, 3, 2	Name	Description
0	Non-specific	There is no specific reason why the value is bad. Used for propagation.
1	Configuration Error	Set if the value is not useful because there is some other problem with the block, depending on what specific manufacturer can detect.
2	Not Connected	Set if this input is not referenced in by a link object within the resource.
3	Device Failure	Set if the source of the value is affected by a device failure.
4	Sensor Failure	Set if the device can determine this condition. The Limits define which direction has been exceeded.
5	No Communication, with last usable value	Set if this value had been set by communication, which has now failed.
6	No Communication, with no usable value	Set if there has never been any communication with this value since it was last Out of Service.
7	Out of Service	The value is not reliable because the block is not being evaluated, and may be under construction by a configurer. Set if the block mode is O/S.

Uncertain sub-status

Value Bit 5, 4, 3, 2	Name	Description
0	Non-specific	There is no specific reason why the value is uncertain. Used for propagation.
1	Last Usable Value	Whatever was writing this value has stopped doing so. (This happens when an input is disconnected by a configurer.)
2	Substitute	Set when the value is written when the block is not Out of Service.
3	Initial Value	Set when the value of an input parameter is written while the block is Out of Service.
4	Sensor Conversion not Accurate	Set if the value is at one of the sensor limits. The Limits define which direction has been exceeded. Also set if the device can determine that the sensor has reduced accuracy (e.g. degraded analyzer), in which case no imits are set.
5	Engineering Unit Range Violation	Set if the value lies outside of the range of values defined for this parameter. The Limits define which direction has been exceeded.
6	Sub-normal	Set if a value derived from multiple values has less than the required number of Good sources.

Good (Non-cascade) sub-status

Value Bit 5, 4, 3, 2	Name	Description
0	Non-specific	There is no specific reason why the value is good. No error or special condition is associated with this value.
1	Active Block Alarm	Set if the value is good and the block has an active Block Alarm.
2	Active Advisory Alarm	Set if the value is good and the block has an active Alarm with a priority less than 8.
3	Active Critical Alarm	Set if the value is good and the block has an active Alarm with a priority greater than or equal to 8.
4	Unacknowledged Block Alarm	Set if the value is good and the block has an unacknowledged Block Alarm.
5	Unacknowledged Advisory Alarm	Set if the value is good and the block has an unacknowledged Alarm with a priority less than 8.
6	Unacknowledged Critical Alarm	Set if the value is good and the block has an unacknowledged Alarm with a priority greater than or equal to 8.

PROFIBUS PA:

Coding of the Physical Block Parameter DIAGNOSIS

Octet	Bit	Mnemonic	Description
1	0	DIA_HW_ELECTR	Hardware failure of the electronic
1	1	DIA_HW_MECH	Hardware failure mechanics
1	2	DIA_TEMP_MOTOR	Motor- temperature too high
1	3	DIA_TEMP_ELECTR	Electronic temperature too high
1	4	DIA_MEM_CHKSUM	Memory error
1	5	DIA_MEASUREMENT	Failure in measurement
1	6	DIA_NOT_INIT	Device not initialized (No selfcalibration)
1	7	DIA_INIT_ERR	Selfcalibration failed
2	0	DIA_ZERO_ERR	Zero point error (limit position)
2	1	DIA_SUPPLY	Power supply failed (electrical, pneumatic)
2	2	DIA_CONF_INVAL	Configuration not valid
2	3	DIA_WARMSTART	New-start-up (warmstart up) carried out.
2	4	DIA_COLDSTART	Re-start-up (coldstart up) carried out.
2	5	DIA_MAINTAINANCE	Maintenance required
2	6	DIA_CHARACT	Characterization invalid
2	7	IDENT_NUMBER_VIOLATION	Set to 1 (one), if the Ident_Number of the running cyclic data transfer and the value of Physical Block IDENT_NUMBER_SELECTOR parameter are different.
3	0...7	reserved	Reserved
4	0...6	reserved	Reserved
4	7	EXTENSION_AVAILABLE	More diagnosis information is available

Coding of the Physical Block Parameter DIAGNOSIS_EXTENSION

Octet	Bit	Mnemonic	Description
1	0	DIA_SENSOR_ERR	Sensor failure
1	1	DIA_OTHER	An error has occurred that was not identified.
1	2	DIA_SOFTWARE_ERR	The software has detected an error.
1	3	DIA_CALIBRATION_ERR	An error occurred during calibration of the device or a calibration error has been detected during operation of the device.
1	4	DIA_MAINTAINCANCE_SOON	Maintenance required soos

Foundation Fieldbus:

Resource Block and Transducer Block

BLOCK_ERR: The block error parameter reflects the error status of associated hardware or software components and directly impacts the correct operation of a block. Block errors will notified as block alarms.

Value	Error	Description
0	Other	
1	Block Configuration Error	
2	Link Configuration Error	
3	Simulate Active	For the resource block, Simulate Active will be used to indicate that the simulate hardware jumper is present. An active state (1) of this attribute will indicate that the jumper is present and that it is possible for the user to enable simulation in an input or output class function block.
4	Local Override	
5	Device Fault State Set	
6	Device Needs Maintenance Soon	
7	Sensor Failure	detected by this block/process variable has a status of BAD, Sensor Failure
8	Output Failure	
9	Memory Failure	detected by this block/back calculation input has a status of BAD, Device Failure
10	Lost Static Data	
11	Lost NV Data	
12	Readback Check Failed	
13	Device Needs Maintenance Now	
14	Power-up	
14	Out-of-Service	

Transducer block

XD_ERROR: An additional parameter, XD_ERROR, must be used to hold the single error subcode that the manufacturer considers most important when one or more errors occur. BLOCK_ERR will have bit 0 set whenever XD_ERROR is non-zero.

Value	Error	Description
16	Unspecified error	An error has occurred that was not identified.
17	General error	An error has occurred that could not be classified as one of the errors below.
18	Calibration error	An error occurred during calibration of the device or a calibration error has been detected during operation of the device.
19	Configuration error	An error occurred during configuration of the device or a configuration error has been detected during operation of the device.
20	Electronics Failure	An electronic component has failed.
21	Mechanical Failure	A mechanical component has failed.
22	I/O Failure	An I/O failure has occurred
23	Data Integrity Error	Indicates that data stored within the system may no longer be valid due to NVM checksum failure, Data verify after write failure, etc.
24	Software Error	The software has detected an error. This could be caused by an improper interrupt service routine, an arithmetic overflow, a watchdog timer, etc.
25	Algorithm Error	The algorithm used in the transducer block produced an error. This could be due to an overflow, data reasonableness failure, etc.

Technical Data

The measuring range and the measuring properties depend on which type of sensor is installed – see the operating instructions for the sensor being used.

CE markings [1]	— Devices and protective systems for use for the intended purpose in explosion-hazard area (Directive 94/9/EC) — Electromagnetic compatibility (Directive 2004/108/EC) max. influence on sensor: 2 x repeatability
Ingress protection	IP 66 / IP 67, according to EN 60 529 / IEC 529 (NEMA 4)
Approvals	**Polytron 7000 is approved as type P3U and type P3FB.**
ATEX	Device markings in accordance with 94/9/EC
— **Type P3U & P3FB:**	CE 0158 Ex II 1G / I M1 Ex ia IIC T4 Ga (–40 °C ≤ Ta ≤ +65 °C) Ex ia IIC T6 Ga (–40 °C ≤ Ta ≤ +40 °C) Ex ia I Ma (–40 °C ≤ Ta ≤ +65 °C) CE 0158 Ex II 3G Ex ic IIC T4 Gc (–40 °C ≤ Ta ≤ +65 °C) Ex ic IIC T6 Gc (–40 °C ≤ Ta ≤ +40 °C) BVS 03 ATEX E 406 X 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 (indicated by Serial No.) [2] Dräger Safety, 23560 Lübeck, Germany
— **Type P3U:**	Safety parameters for the supply voltage and signalling circuit (outermost terminals of the docking station): U_i = 30 V, I_i = 0.3 A, P_i = 700 mW, C_i = 5 nF, L_i = 50 µH
— **Type P3FB:**	FISCO Field Device Power Supply: U_i = 24 V, I_i = 0.38 A, P_i = 5.32 W, C_i = 5 nF, L_i = 10 µH

1) EN 50270 – For the display valid for table 2.1 and for table 3.1 is assessment criterion B.
EN 50270: For HART-Communication with connected Remote-Sensor valid for table 3.1 is assessment criterion B.
2) Year of construction is coded by the third letter in the serial number shown on the rating plate: A = 2009, B = 2010, C = 2011, D = 2012, E = 2013 etc.
Example: Serial No. ARDH-0054: the third letter is D, which means that the unit was manufactured in 2012.

IECEx	Ex ia IIC T4 Ga (–40 °C ≤ Ta ≤ +65 °C)
– **Type P3U & P3FB:**	Ex ia IIC T6 Ga (–40 °C ≤ Ta ≤ +40 °C) Ex ia I Ma (–40 °C ≤ Ta ≤ +65 °C) Ex ic IIC T4 Gc (–40 °C ≤ Ta ≤ +65 °C) Ex ic IIC T6 Gc (–40 °C ≤ Ta ≤ +65 °C) IECEx BVS 04 0003 X Year of construction (via serial number) [1)] Dräger Safety, 23560 Lübeck, Germany
– **Typ P3U :**	Power supply: U_i = 30 V, I_i = 0.3 A, P_i = 700 mW, C_i = 5 nF, L_i = 50 µH
– **Typ P3FB:**	FISCO Field Device Power Supply: U_i = 24 V, I_i = 0,38 A, P_i = 5,32 W, C_i = 5 nF, L_i = 10 µH
UL (Underwriters Laboratories Inc.)	
– **Type P3U & P3FB:**	Only as to Intrinsic Safety for use in Hazardous Locations Class I, Div. 1, Groups A, B, C, D Class II, Div. 1, Groups E, F, G Use in accordance with Dräger Control Drawing SE20105. T4: –40 Ta +65 °C, T6: –40 Ta +40 °C. Not tested in oxygen enriched atmospheres (>21 % O_2). CLASSIFIED UL 9N54
– **Typ P3U:**	Power Supply: V_{max} = 30 V, I_{max} = 0,3 A, P_i = 700 mW, C_i = 5 nF, L_i = 50 µH
– **Typ P3FB:**	FISCO Field Device Power Supply: V_{max} = 24 V, I_{max} = 0,38 A, P_{max} = 5,32 W, C_i = 5 nF, L_i = 10 µH
CSA (Canadian Standards Association)	
– **Type P3U & P3FB:**	Intrinsic safe Class I, Div. 1, Groups A, B, C, D Class II, Div. 1, Groups E, F, G LR97594 NRTL/C Use in accordance with Dräger Control Drawing SE20106.
– **Typ P3U:**	Power supply: V_{max} = 30 V, I_{max} = 0.3 A, P_{max} = 700 mW, C_i = 5 nF, L_i = 50 µH
– **Typ P3FB:**	FISCO Field Device Power Supply: V_{max} = 24 V, I_{max} = 0,38 A, P_{max} = 5,32 W, C_i = 5 nF, L_i = 10 µH

Signal transmission to central unit	
Analogue	
— Measured-value signal	4 mA to 20 mA
— Drift below zero point	3.8 mA to 4 mA
— Full-scale value exceeded	20 mA to 20.5 mA
— Unit fault	<3.2 mA
— Maintenance signal	3.4 mA
Options which can be switched on or off:	
— Warning	Fault signal for 1 second every 10 seconds [1]
Digital	HART compatible, transmission on two- or three-wire, shielded cable
Analogue (4 to 20 mA) signal transmission (2-wire)	
— Supply voltage (w/o pump or relay module)	
— for a current of 3 mA	16.5 V DC to 30 V DC
— For a current of 22 mA	min. 8.0 V DC at the transmitter
— AC component	<0.5 V_{SS}
Analogue (4 to 20 mA) signal transmission (3-wire)	
— Supply voltage	— 12 V DC to 30 V DC (w/o pump or relay module)
— AC component	<0.5 V_{SS}
— Load resistance	0 ohm to 40 [ohm/volt] x (U_S[2] – 4 V)
Digital signal transmission (2-wire)	16.5 V DC to 30 V DC
— AC component	<0.2 V_{SS} ; <2.2 mV_{eff} (500 to 10 000 Hz)
— Load resistance	0 ohm to 40 [ohm/volt] x (U_S[2] – 4 V)
Digital signal transmission (3-wire)	
— supply voltage	12 V DC to 30 V DC (w/o pump or relay module)
— AC component	<0.2 V_{SS}
— load resistance	230 ohm to 40 [ohm/volt] x (U_S[2] – 4 V), max. 600 ohm
Digital signal transmission (4-wire)	
— supply voltage	12 V DC to 30 V DC (w/o pump or relay module)
— AC component	<0.2 V_{SS}
— load resistance	230 ohm to 40 [ohm/volt] x (U_S[2] – 4 V), max. 600 ohm
PROFIBUS PA	
— Communication rate	31.25 kBaud
— Data volume	244 Byte
— Bus length	max. 1900m
— Segment size	max. 32 slaves
— Physical layer	IEC 61158-2; digital, bit-synchronous, Manchester Encoding
— Segment current	18.1 mA
Foundation Fieldbus:	
— Communication rate	31.25 kBaud
— Data volume	128 Byte
— Bus length	max. 1900m
— Segment size	max. 240 nodes
— Physical layer	IEC 61158-2; digital, bit-synchronous, Manchester Encoding

1) Can be configured as desired. Factory setting: disabled.
2) Actual supply voltage at the transmitter.

Power consumption (without analogue signal transmission)	typical 50 mW
Cable inlet	M20 x 1.5; cable diameter 6 mm (0.24") to 12 mm (0.47")
Wire cross-section	0.5 mm^2 (AWG 20) to 2.5 mm^2 (AWG 13)
Weight	approx. 0.9 kg / 2.0 lb, without pump and relay module.
Ambient conditions	Specifications for the sensor: see sensor data sheet
for operation	–40 to 65 °C (–40 to 160°F) [1)] 700 to 1300 hPa (20.7 to 38.4 inch Hg) 0 to 100 % relative humidity, non condensing
during storage	–40 to 70 °C (–40 to 150°F) 700 to 1300 hPa (20.7 to 38.4 inch Hg) 0 to 100 % relative humidity, non condensing

1) The legibility of the display is restricted at temperatures below –20 °C (–5 °F). Operation of the transmitters becomes more difficult at subzero temperatures due to the increasing slowness of the display.
2) Actual supply voltage at the transmitter.

Relay module

CAUTION

The relay module is not covered by the explosion protection approvals.
Use is not permitted in explosion-hazard areas! Explosion hazard!

Supply voltage (DC)	12 V to 30 V at the transmitter
Relay 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
Ambient conditions	
for operation	–40 to 65 °C (–40 to 160°F) 700 to 1300 hPa (20.7 to 38.4 inch Hg) 0 to 100 % relative humidity, non condensing
during storage	–40 to 70 °C (–40 to 150°F) 700 to 1300 hPa (20.7 to 38.4 inch Hg) 0 to 100 % relative humidity, non condensing
CE markings	— Electromagnetic compatibility (Directive 2004/108/EC) — Low-voltage equipment (Directive 2006/95/EC), when used with transmitter)

Pump module

CAUTION

The pump module is not covered by the explosion protection approvals.
Use is not permitted in explosion-hazard areas! Explosion hazard!

Supply voltage (DC)	
— for an output of 0.5 L/min	12 V to 30 V at the transmitter
— for an output of 1.0 L/min	16 V to 30 V at the transmitter
— for an output of 1.5 L/min	20 V to 30 V at the transmitter
Power consumption	
— for an output of 0.5 L/min	<2 W
— for an output of 1.0 L/min	<4 W
— for an output of 1.5 L/min	<6 W
Output	
— Setting range	approx. 0.5 l/min to 1.5 l/min (approx. 30 % to 100 %)
— Factory setting	0.5 L/min
Flow warning	
— Factory setting	0.4 L/min
Flow alarm	
— Factory setting	0.3 L/min
Hose connectors	
— Internal hose diameter	5 mm
Materials used in the gas path	
— Pump adapter	PP, Viton
— Gas guides	PP, glass
— Dust filter	PE
— Pump	EPDM, PTFE, Niro
Ambient conditions	
for operation	0 to 55 °C (32 to 130°F) 700 to 1300 hPa (20.7 to 38.4 inch Hg) 0 to 100 % relative humidity, non condensing
during storage	–40 to 70 °C (–40 to 150°F) 700 to 1300 hPa (20.7 to 38.4 inch Hg) 0 to 100 % relative humidity, non condensing
CE markings	— Electromagnetic compatibility (Directive 2004/108/EC), when used with transmitter

Order List

Part name and description	**Order No.**
Dräger Polytron 7000 4 to 20 mA D, with display and keypad	83 17 610
Dräger Polytron 7000 4 to 20 mA D with relay module, with display and keypad	83 17 636
Dräger Polytron 7000 4 to 20 mA D with pump module, with display and keypad	83 17 637
Dräger Polytron 7000 4 to 20 mA D with relay and pump modules, with display and keypad	83 17 638
Dräger Polytron 7000 4 to 20 mA HART D, with display and keypad	83 17 710
Dräger Polytron 7000 4 to 20 mA HART D with relay module, with display and keypad	83 17 776
Dräger Polytron 7000 4 to 20 mA HART D with pump module, with display and keypad	83 17 777
Dräger Polytron 7000 4 to 20 mA HART D with relay and ump modules, with display and keypad	83 17 778
Dräger Polytron 7000 LON D, with display and keypad	83 17 810
Dräger Polytron 7000 LON D with relay module, with display and keypad	83 17 816
Dräger Polytron 7000 LON D with pump module, with display and keypad	83 17 817
Dräger Polytron 7000 LON D with relay and pump modules, with display and keypad	83 17 818
Dräger Polytron 7000 PB, with PROFIBUS module with display and keypad	83 19 430
Dräger Polytron 7000 PB, with PROFIBUS module, relay module, display and keypad	83 19 427
Dräger Polytron 7000 PB, with PROFIBUS module, pump module, display and keypad	83 19 436
Dräger Polytron 7000 PB, with PROFIBUS module, relay module and pump module, display and keypad	83 19 438
Dräger Polytron 7000 FF, with Foundation Fieldbus module, with display and keypad	83 19 440
Dräger Polytron 7000 FF, with Foundation Fieldbus module, relay module, with display and keypad	83 19 428
Dräger Polytron 7000 FF, with Foundation Fieldbus module, pump module, display and keypad	83 19 437

Part name and description	**Order No.**
Dräger Polytron 7000 FF, with Foundation Fieldbus module, relay module and pump module, display and keypad	83 19 439
Dräger Docking Station	83 17 990
Sensors	
DrägerSensor AC	68 10 595
DrägerSensor Cl_2	68 09 665
DrägerSensor CO	68 09 605
DrägerSensor CO LS	68 09 620
DrägerSensor $COCl_2$	68 09 930
DrägerSensor H_2	68 09 685
DrägerSensor H_2S	68 10 435
DrägerSensor H_2S	68 09 610
DrägerSensor H_2S HC	68 09 710
DrägerSensor H_2O_2	68 09 705
DrägerSensor H_2O_2 HC	68 09 675
DrägerSensor HCl	68 09 640
DrägerSensor HCN	68 09 650
DrägerSensor Hydrazine	68 10 180
DrägerSensor Hydride	68 09 635
DrägerSensor Hydride SC	68 09 980
DrägerSensor NH_3	68 09 680
DrägerSensor NH_3 HC	68 09 645
DrägerSensor NO	68 09 625
DrägerSensor NO HC	68 09 715
DrägerSensor NO_2	68 09 655
DrägerSensor O_2	68 09 720
DrägerSensor O_2 LS	68 09 630
DrägerSensor O_3	68 10 290
DrägerSensor OV1 (Organic Vapours)	68 10 740
DrägerSensor OV2 (Organic Vapours)	68 10 745
DrägerSensor SO_2	68 09 660
Accessories	
Pump module	on request
Relay module	on request
Cable Entry Set – Daisy Chain	83 17 282
Remote sensor	83 17 275
Remote adapter, 5 m	83 17 270
Remote adapter, 15 m	83 17 998
Remote adapter, 30 m	83 17 999

Part name and description	**Order No.**
Duct adapter for remote sensor	83 17 617
Dräger Polytron 7000 Data Dongle	83 17 618
Dräger Polytron 7000 Sensor Dongle	83 17 619
Dräger Polytron 7000 Sensor Diagnostic Dongle	83 17 860
Pump adapter for AC sensor used with 68 09 380	83 17 976
Gas Vision	83 14 034
CC Vision	64 08 515
IR data cable, USB DIRA	83 17 409
Calibration accessories	
Calibration adapter	68 06 978
Calibration adapter V	68 10 536
Calibration adapter for AC sensor	68 09 380
Calibration flask	68 03 407
Adapter for calibration flask	68 04 620
Manual pump	68 01 933
Test-gas ampoules and calibration gas, see operating instructions for the DrägerSensor being used	

ATEX approval

EXAM
BBG Prüf- und Zertifizier GmbH

Translation

(1) **EC-Type Examination Certificate**

(2) **- Directive 94/9/EC -**
Equipment and protective systems intended for use in potentially explosive atmospheres

(3) **BVS 03 ATEX E 406 X**

(4) **Equipment:** **Gas measuring transmitter type P3S and type P3U**

(5) **Manufacturer:** **Dräger Safety AG & Co. KGaA**

(6) **Address:** **D - 23560 Lübeck**

(7) The design and construction of this equipment and any acceptable variation thereto are specified in the schedule to this type examination certificate.

(8) The certification body of EXAM BBG Prüf- und Zertifizier GmbH, notified body no. 0158 in accordance with Article 9 of the Directive 94/9/EC of the European Parliament and the Council of 23 March 1994, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres, given in Annex II to the Directive.
The examination and test results are recorded in the test and assessment report BVS PP 03.2298 EG.

(9) The Essential Health and Safety Requirements are assured by compliance with:

EN 50014:1997+A1-A2	General requirements
EN 50020:2002	Intrinsic safety ´i´
EN 50021:1999	Type of Protection ´n´
EN 50284:1999	Equipment Group II Category 1G

(10) If the sign "X" is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the schedule to this certificate.

(11) This EC-Type Examination Certificate relates only to the design, examination and tests of the specified equipment in accordance to Directive 94/9/EC.
Further requirements of the Directive apply to the manufacturing process and supply of this equipment. These are not covered by this certificate

(12) The marking of the equipment shall include the following:

II 1G EEx ia IIC T4/T6

II 3G EEx nL IIC T4/T6

EXAM BBG Prüf- und Zertifizier GmbH
Bochum, dated 15. January 2004

Signed: Jockers — Certification body

Signed: Eickhoff — Special services unit

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(until 31.05.2003: Deutsche Montan Technologie GmbH Am Technologiepark 1 45307 Essen)

EXAM
BBG Prüf- und Zertifizier GmbH

(13) Appendix to

(14) # EC-Type Examination Certificate

BVS 03 ATEX E 406 X

(15) 15.1 Subject and type

Gas measuring transmitter type P3S and type P3U

15.2 Description

The Gas measuring transmitter type P3S and P3U are intended for gas detection under atmospheric conditions in fixed installations. The device is housed in a plastic enclosure (surface resistance < 10^9 Ω). Supply of the electronics and signalling is accomplished by a 2-, 3- or 4-wire connection. For all cases, supply and signalling occur from one common intrinsically safe circuit. Both device types may be equipped with a "Duct Extension". This enables direct mounting of the device to a duct, due to the protruding sensor.

P3S:
The device may be equipped with an integral LC-Display for displaying the measurement value. The front of the device provides a circular bayonet cover, which may be opened for maintenance work (calibration). Behind the opening, control elements and 2 contacts are located. The contacts allow connection of an I.S. certified voltage meter, which enables reading of the measurement value in case no internal display is provided.

P3U:
The device may be equipped with an integral LC-Display for displaying the measurement value and a membrane keypad. For measurements at remote locations the P3U Remote Adapter may be plugged in, instead of the electrochemical sensor. The cable of the P3U Remote Adapter, which may be up to 100 m in length, connects to the P3U Remote Sensor which now accepts the electrochemical sensor.

15.3 Parameters

15.3.1 Gas measuring transmitter type P3S

15.3.1.1 Supply-/signal circuit
Connection via terminals X1/1 and X1/2

Maximum input voltage	U_i	DC 30	V
Maximum input current	I_i	300	mA
Maximum input power	P_i	700	mW
Maximum internal capacitance	C_i	negligible	
Maximum internal inductance	L_i	50	µH

15.3.1.2 Measuring circuit, for calibration only
Connection via 2 contact areas

Maximum output voltage	U_o	DC 7,6	V
Maximum output current	I_o	1	mA
Maximum external capacitance	C_o	2,5	µF
Maximum external inductance	L_o	10	mH
Maximum input voltage	U_i	DC 10,4	V
Maximum internal capacitance	C_i	negligible	
Maximum internal inductance	L_i	negligible	

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EXAM
BBG Prüf- und Zertifizier GmbH

15.3.2 Gas measuring transmitter type P3U

Supply-/signal circuit
Connection via terminals X7/1 - X7/4 or X8/1 - X8/4 (looped through)

Maximum input voltage	U_i	DC	30	V
Maximum input current	I_i		300	mA
Maximum input power	P_i		700	mW
Maximum internal capacitance	C_i		5	nF
Maximum internal inductance	L_i		50	µH

15.3.3 Ambient temperature range

II 1G EEx ia IIC T6	- 40 °C up to + 40 °C
II 1G EEx ia IIC T4	- 40 °C up to + 65 °C
II 3G EEx nL IIC T6	- 25 °C up to + 40 °C
II 3G EEx nL IIC T4	- 25 °C up to + 65 °C

(16) Test and assessment report
BVS PP 03.2298 EG as of 15.01.2004

(17) Special conditions for safe use

17.1 For use in Category 3 areas, the Gas measuring transmitter has been tested according to EN 50021, part 26, Mechanical strength test. The display window has been tested as a light transmitting part and has passed the test at 1 Joule at -25 °C, low risk for mechanical damage.

17.2 The measurement function for explosion protection is not the subject of this EC-Type Examination Certificate.

We confirm the correctness of the translation from the German original.
In the case of arbitration only the German wording shall be valid and binding.

44809 Bochum, 15.01.2004
BVS-Rip/Mi A 20030560

EXAM BBG Prüf- und Zertifizier GmbH

Certification body

Special services unit

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(until 31.05.2003: Deutsche Montan Technologie GmbH Am Technologiepark 1 45307 Essen)

EXAM
BBG Prüf- und Zertifizier GmbH

Translation

1st Supplement

(Supplement in accordance with Directive 94/9/EC Annex III number 6)

to the EC-Type Examination Certificate
BVS 03 ATEX E 406 X

Equipment: **Gas detection transmitter type P3S and P3U**

Manufacturer: **Dräger Safety AG & Co. KGaA**

Address: **D-23560 Lübeck**

Description

The Essential Health and Safety Requirements with respect to the measuring function for explosion protection are assured by application of:

EN 50104:2002 + A1:2004
EN 50271:2001

This supplement to the EC-type examination certificate covers devices type P3U with software versions 7.2 (main) and V13 (SIOS) for data transmission via the 4-20 mA interface and operation without pump module and without relay module.
This supplement to the EC-type examination certificate covers the measuring function for oxygen (measurement of inertisation) in the measuring range 0 - 25 %(v/v).

Test report

Test report PFG-no. 413000504P dated 22/06/2005

Special conditions for safe use:

- see EC-type examination certificate BVS 03 ATEX E 406 X, 17.1
- For the sensor O2 (part-no. **68 09 720**), the test "unpowered storage of the apparatus" was performed in the temperature range -20 ... +40 °C.

EXAM BBG Prüf- und Zertifizier GmbH
Bochum, dated 23/06/2005

Signed: Jockers
Certification body

Signed: Kiesewetter
Special services unit

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EXAM
BBG Prüf- und Zertifizier GmbH

We confirm the correctness of the translation from the German original.
In the case of arbitration only the German wording shall be valid and binding.

44809 Bochum, 23. June 2005
PFG-Kie

EXAM BBG Prüf- und Zertifizier GmbH

Certification body

Special services unit

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[redacted]

EXAM
BBG Prüf- und Zertifizier GmbH

Translation

2nd Supplement

(Supplement in accordance with Directive 94/9/EC Annex III number 6)

to the EC-Type Examination Certificate
BVS 03 ATEX E 406 X

Equipment: **Gas measuring transmitter type P3FB**

Manufacturer: **Dräger Safety AG & Co. KGaA**

Address: **23560 Lübeck, Germany**

Description

The Gas measuring transmitter type P3U can be modified according to the descriptive documents as mentioned in the pertinent test and assessment report and receives then the marking:

type P3FB

The gas measuring transmitter type P3FB is identical to the type P3U, except that the printed circuit board "4-20mA/HART" is replaced by the printed circuit board "PB/FF module", which provided a field bus connection in accordance with the FISCO/FNICO concept classified in IEC 60079-27 (Terminal X7).

The Essential Health and Safety Requirements of the modified equipment are assured by compliance with:

EN 50014:1997+A1-A2	General requirements
EN 50020:2002	Intrinsic safety 'i'
EN 60079-15:2003	Type of Protection 'n'
EN 50284:1999	Equipment Group II Category 1G
IEC 60079-27:2005	Fieldbus intrinsically safe concept (FISCO) and Fieldbus non-incendive concept (FNICO)

The marking of the equipment shall include the following:

II 1G EEx ia IIC T4/T6
II 3G EEx nL IIC T4/T6

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EXAM
BBG Prüf- und Zertifizier GmbH

Parameters

1 Gas measuring transmitter type P3FB

Field bus connection in accordance with the FISCO/FNICO concept, connection only via terminal X7

Maximum input voltage	U_i	DC	24	V
Maximum input current	I_i		380	mA
Maximum input power	P_i		5.32	W
Maximum internal capacitance	C_i		5	nF
Maximum internal inductance	L_i		10	µH

2 Ambient temperature range

II 1G EEx ia IIC T6	-40 °C up to +40 °C
II 1G EEx ia IIC T4	-40 °C up to +65 °C
II 3G EEx nL IIC T6	-25 °C up to +40 °C
II 3G EEx nL IIC T4	- 25 °C up to +65 °C

Special conditions for safe use

The measurement function for explosion protection is not the subject of this supplement to the EC-Type Examination Certificate.

Test and assessment report
BVS PP 03.2298 EG as of 07.11.2006

EXAM BBG Prüf- und Zertifizier GmbH
Bochum, dated 07. November 2006

Signed: Dr. Eickhoff
Certification body

Signed: Schumann
Special services unit

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EXAM
BBG Prüf- und Zertifizier GmbH

We confirm the correctness of the translation from the German original.
In the case of arbitration only the German wording shall be valid and binding.

44809 Bochum, 07.11.2006
BVS-Rip/Mi A 20060540

EXAM BBG Prüf- und Zertifizier GmbH

Certification body

Special services unit

Translation

3rd Supplement

(Supplement in accordance with Directive 94/9/EC Annex III number 6)

to the EC-Type Examination Certificate
BVS 03 ATEX E 406 X

Equipment: **Gas detection transmitter type P3U**

Manufacturer: **Dräger Safety AG & Co. KGaA**

Address: **D-23560 Lübeck**

Description

The Essential Health and Safety Requirements with respect to the measuring function for explosion protection are assured by application of:

EN 50104:2002 + A1:2004
EN 50271:2001

This supplement to the EC-type examination certificate covers operation of the devices with pump module or relay module and modifications of the software (main).
This supplement to the EC-type examination certificate covers devices type P3U with software versions 7.5, 7.6 and 7.8 (main), V13 (SIOS) and V11 and V12 (pump module) for data transmission via the 4-20 mA interface.
This supplement to the EC-type examination certificate covers the measuring function for oxygen (measurement of inertisation) in the measuring range 0 - 25 %(v/v).

Test report

Test report PFG-no. 413000504P NI dated 27/04/2007

Special conditions for safe use

- See 1st supplement to the EC-type examination certificate BVS 03 ATEX E 406 X
- Devices with pump module or relay module shall not be operated in potentially explosive atmospheres. Suitable measures for explosion protection shall be taken when the gas probe is pumped out of potentially explosive atmospheres.
- The relay module shall be operated with devices with software version 7.8 (main).
- Alarms shall only be configured to be "non acknowledgeable".
- If the pump module is used the flow failure detection shall be activated.
- The sensor O2 LS shall only be used in conjunction with the pump module in vibration-free installations.

DEKRA EXAM GmbH
Bochum, dated 30/04/2007

Signed: Jockers
Certification body

Signed: Kiesewetter
Special services unit

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DEKRA

We confirm the correctness of the translation from the German original.
In the case of arbitration only the German wording shall be valid and binding.

44809 Bochum, 30. April 2007
PFG-Kie

DEKRA EXAM GmbH

Certification body

Special services unit

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Translation

4th Supplement

(Supplement in accordance with Directive 94/9/EC Annex III number 6)

to the EC-Type Examination Certificate
BVS 03 ATEX E 406 X

Equipment: **Gas detection transmitter type P3U**

Manufacturer: **Dräger Safety AG & Co. KGaA**

Address: **D-23560 Lübeck**

Description

The Essential Health and Safety Requirements with respect to the measuring function for explosion protection are assured by application of:

EN 50104:2002 + A1:2004
EN 50271:2001

This supplement to the EC-type examination certificate covers operation of the devices with pump module or relay module and modifications of the software (main).
This supplement to the EC-type examination certificate covers devices type P3U with software versions 7.5, 7.6, 7.8 and 7.9 (main), V13 (SIOS) and V11, V12 and V13 (pump module) for data transmission via the 4-20 mA interface.
This supplement to the EC-type examination certificate covers the measuring function for oxygen (measurement of inertisation) in the measuring range 0 - 25 %(v/v).

Test report

Test report PFG-no. 413000504P NII dated 15/10/2010

Special conditions for safe use

- See 3rd supplement to the EC-type examination certificate BVS 03 ATEX E 406 X

DEKRA EXAM GmbH
Bochum, dated 15/10/2010

Signed: Simanski
Certification body

Signed: Dr. Kiesewetter
Special services unit

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DEKRA

We confirm the correctness of the translation from the German original.
In the case of arbitration only the German wording shall be valid and binding.

44809 Bochum, 15. October 2010
PFG-Kie

DEKRA EXAM GmbH

Certification body

Special services unit

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Translation

(1) 5. Supplement to the EC-Type Examination Certificate

(2) Equipment and protective systems intended for use in potentially explosive atmospheres - Directive 94/9/EC
Supplement accordant with Annex III number 6

(3) No. of EC-Type Examination Certificate: **BVS 03 ATEX G 406 X**

(4) Equipment: **Gas detection transmitter type P3U**

(5) Manufacturer: **Dräger Safety AG & Co. KGaA**

(6) Address: **D-23560 Lübeck**

(7) The design and construction of this equipment and any acceptable variation thereto are specified in the appendix to this supplement.

(8) The certification body of DEKRA EXAM GmbH, notified body no. 0158 in accordance with Article 9 of the Directive 94/9/EC of the European Parliament and the Council of 23 March 1994, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres, given in Annex II to the Directive. The examination and test results are recorded in the test report PFG-no. 41300504P NIII.

(9) The Essential Health and Safety Requirements are assured by compliance with:

EN 50104:2002 + A1:2004
EN 50271:2001

This supplement to the EC-type examination certificate covers the measuring function for oxygen (measurement of inertisation) in the measuring range 0 - 25 %(v/v). This supplement to the EC-type examination certificate covers devices type P3U with software versions 7.5, 7.6, 7.8 and 8.0 (main), V13 (SIOS) and V13 (pump module) for data transmission via the 4-20 mA interface.

(10) If the sign "X" is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the appendix to this certificate.

(11) This supplement to the EC-Type Examination Certificate relates only to the design, examination and tests of the specified equipment in accordance to Directive 94/9/EC.
Further requirements of the Directive apply to the manufacturing process and supply of this equipment. These are not covered by this certificate.

(12) The marking of the equipment shall include the following:

Not changed

DEKRA EXAM GmbH
Bochum, dated 27. May 2011

Signed: Simanski	Signed: Kiesewetter
Certification body	Special services unit

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(13) Appendix to

(14) **5. Supplement to the EC-Type Examination Certificate**
BVS 03 ATEX E 406 X

(15) 15.1 Subject and type

Gas detection transmitter type P3U

15.2 Description

This supplement to the EC-type examination certificate covers a modified pump, a modified display and modifications of the software (main). The equipment can be modified according to the descriptive documents as mentioned in the pertinent test report.

15.3 Parameters

See EC-type examination certificate BVS 03 ATEX E 406 X

(16) Test and assessment report

PFG-no. 41300504P NIII as of 27.05.2011

(17) Special conditions for safe use

- See 3. supplement to the EC-type examination certificate BVS 03 ATEX E 406 X

We confirm the correctness of the translation from the German original.
In the case of arbitration only the German wording shall be valid and binding.

DEKRA EXAM GmbH
44809 Bochum, 27. May 2011
PFG-Kie/Bre

Certification body

Special services unit

(1) # 6. Supplement to the EC-Type Examination Certificate

(2) Equipment and protective systems intended for use in potentially explosive atmospheres - Directive 94/9/EC
Supplement accordant with Annex III number 6

(3) No. of EC-Type Examination Certificate: **BVS 03 ATEX E 406 X**

(4) Equipment: **Gas measuring transmitter type P3S, P3U and P3FB**
(P3U/P3FB alternative with P3U Remote Adapter and P3U Remote Sensor)

(5) Manufacturer: **Dräger Safety AG & Co. KGaA**

(6) Address: **23560 Lübeck**

(7) The design and construction of this equipment and any acceptable variation thereto are specified in the appendix to this supplement.

(8) The certification body of DEKRA EXAM GmbH, notified body no. 0158 in accordance with Article 9 of the Directive 94/9/EC of the European Parliament and the Council of 23 March 1994, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres, given in Annex II to the Directive. The examination and test results are recorded in the test and assessment report BVS PP 03.2298 EG.

(9) The Essential Health and Safety Requirements are assured by compliance with:

EN 60079-0:2009	**General requirements**
EN 60079-11:2007	**Intrinsic safety ´i´**
EN 60079-26:2007	**Equipment with equipment protection level (EPL) Ga**
EN 60079-27:2008	**Fieldbus intrinsically safe concept (FISCO)**

(10) If the sign "X" is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the appendix to this certificate.

(11) This supplement to the EC-Type Examination Certificate relates only to the design, examination and tests of the specified equipment in accordance to Directive 94/9/EC.
Further requirements of the Directive apply to the manufacturing process and supply of this equipment. These are not covered by this certificate.

(12) The marking of the equipment shall include the following:

II 1G Ex ia IIC T4 Ga
II 1G Ex ia IIC T6 Ga
II 3G Ex ic IIC T4 Gc
II 3G Ex ic IIC T6 Gc

DEKRA EXAM GmbH
Bochum, dated 01.06.2011

Certification body

Special services unit

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(13) Appendix to

(14) **6. Supplement to the EC-Type Examination Certificate**
BVS 03 ATEX E 406 X

(15) 15.1 Subject and type

Unchanged

15.2 Description

The gas measuring transmitter type P3S, P3U and P3FB can be modified according to the descriptive documents as mentioned in the pertinent test and assessment report.

The gas measuring transmitter type P3S, P3U, P3FB (P3U/P3FB alternative with P3U Remote Adapter and P3U Remote Sensor) was tested according to the new standard versions of IEC 60079-* (see page 1). The marking was modified according to the new standard versions.

The internal electronics was slightly modified.

The gas measuring transmitter receives the following marking and ambient temperature range:

II 1G Ex ia IIC T4 Ga	(-40°C ≤ T_a ≤ + 65°C)
II 1G Ex ia IIC T6 Ga	(-40°C ≤ T_a ≤ + 40°C)
II 3G Ex ic IIC T4 Gc	(-40°C ≤ T_a ≤ + 65°C)
II 3G Ex ic IIC T6 Gc	(-40°C ≤ T_a ≤ + 40°C)

15.3 Parameters

15.3.1 Electrical parameters

Unchanged

15.3.2 Thermal parameters

Ambient temperature range depend on temperature class for all types:

-40°C ≤ T_a ≤ + 65°C (T4)
-40°C ≤ T_a ≤ + 40°C (T6)

(16) Test and assessment report

BVS PP 03.2298 EG as of 01.06.2011

(17) Special conditions for safe use

In applications, which require devices of the category 1G (Zone 0) resp. EPL Ga, intensive electrostatic charging processes have to be prevented.

The measurement function for explosion protection is not the subject of this Supplement to the EC-Type Examination Certificate.

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(1) # 7. Supplement to the EC-Type Examination Certificate

(2) Equipment and protective systems intended for use in potentially explosive atmospheres - Directive 94/9/EC
Supplement accordant with Annex III number 6

(3) No. of EC-Type Examination Certificate: **BVS 03 ATEX E 406 X**

(4) Equipment: **Gas measuring transmitter type P3S, P3U and P3FB**
(P3U/P3FB alternative with P3U Remote Adapter and P3U Remote Sensor)

(5) Manufacturer: **Dräger Safety AG & Co. KGaA**

(6) Address: **23560 Lübeck**

(7) The design and construction of this equipment and any acceptable variation thereto are specified in the appendix to this supplement.

(8) The certification body of DEKRA EXAM GmbH, notified body no. 0158 in accordance with Article 9 of the Directive 94/9/EC of the European Parliament and the Council of 23 March 1994, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres, given in Annex II to the Directive. The examination and test results are recorded in the test and assessment report BVS PP 03.2298 EG.

(9) The Essential Health and Safety Requirements are assured by compliance with:

EN 60079-0:2009	**General requirements**
EN 60079-11:2007	**Intrinsic safety ´i´**
EN 60079-26:2007	**Equipment with equipment protection level (EPL) Ga**
EN 60079-27:2008	**Fieldbus intrinsically safe concept (FISCO)**
EN 50303:2000	**Equipment for Group I Category M1**

(10) If the sign "X" is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the appendix to this certificate.

(11) This supplement to the EC-Type Examination Certificate relates only to the design, examination and tests of the specified equipment in accordance to Directive 94/9/EC.
Further requirements of the Directive apply to the manufacturing process and supply of this equipment. These are not covered by this certificate.

(12) The marking of the equipment shall include the following:

II 1G Ex ia IIC T4 Ga
II 1G Ex ia IIC T6 Ga
I M1 Ex ia I Ma
II 3G Ex ic IIC T4 Gc
II 3G Ex ic IIC T6 Gc

DEKRA EXAM GmbH
Bochum, dated 01.12.2011

Certification body

Special services unit

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(13) Appendix to

(14) **7. Supplement to the EC-Type Examination Certificate**
BVS 03 ATEX E 406 X

(15) 15.1 Subject and type

Unchanged

15.2 Description

The gas measuring transmitter type P3S, P3U and P3FB can be modified according to the descriptive documents as mentioned in the pertinent test and assessment report.

The Gas measuring transmitter type P3S, P3U and P3FB (P3U/P3FB alternative with P3U Remote Adapter and P3U Remote Sensor) was tested for use in Group I.

The marking was modified according to the enhanced range of application.

The gas measuring transmitter receives the following marking and ambient temperature range:

II 1G Ex ia IIC T4 Ga	(-40 °C ≤ T_a ≤ +65 °C)
II 1G Ex ia IIC T6 Ga	(-40 °C ≤ T_a ≤ +40 °C)
I M1 Ex ia I Ma	(-40 °C ≤ T_a ≤ +65 °C)
II 3G Ex ic IIC T4 Gc	(-40 °C ≤ T_a ≤ +65 °C)
II 3G Ex ic IIC T6 Gc	(-40 °C ≤ T_a ≤ +40 °C)

15.3 Parameters

15.3.1 Electrical parameters

Unchanged, the parameters are valid for the use in Group I areas, too.

15.3.2 Thermal parameters

Ambient temperature range depends on temperature class and group for all types:

-40 °C ≤ T_a ≤ +65 °C (T4 and Group I)
-40 °C ≤ T_a ≤ +40 °C (T6)

(16) Test and assessment report

BVS PP 03.2298 EG as of 01.12.2011

(17) Special conditions for safe use

Unchanged

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(1) # 8. Supplement to the EC-Type Examination Certificate

(2) Equipment and protective systems intended for use in potentially explosive atmospheres - Directive 94/9/EC
Supplement accordant with Annex III number 6

(3) No. of EC-Type Examination Certificate: **BVS 03 ATEX E 406 X**

(4) Equipment: **Gas measuring transmitter type P3S, P3U and P3FB**
(P3U/P3FB alternative with P3U Remote Adapter and P3U Remote Sensor)

(5) Manufacturer: **Dräger Safety AG & Co. KGaA**

(6) Address: **Revalstr. 1, 23560 Lübeck, Germany**

(7) The design and construction of this equipment and any acceptable variation thereto are specified in the appendix to this supplement.

(8) The certification body of DEKRA EXAM GmbH, notified body no. 0158 in accordance with Article 9 of the Directive 94/9/EC of the European Parliament and the Council of 23 March 1994, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres, given in Annex II to the Directive. The examination and test results are recorded in the test and assessment report BVS PP 03.2298 EG.

(9) The Essential Health and Safety Requirements are assured by compliance with:

EN 60079-0:2009	**General requirements**
EN 60079-11:2007	**Intrinsic safety 'i'**
EN 60079-26:2007	**Equipment with equipment protection level (EPL) Ga**
EN 60079-27:2008	**Fieldbus intrinsically safe concept (FISCO)**
EN 50303:2000	**Equipment for Group I Category M1**

(10) If the sign "X" is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the appendix to this certificate.

(11) This supplement to the EC-Type Examination Certificate relates only to the design, examination and tests of the specified equipment in accordance to Directive 94/9/EC.
Further requirements of the Directive apply to the manufacturing process and supply of this equipment. These are not covered by this certificate.

(12) The marking of the equipment shall include the following:

II 1G Ex ia IIC T4 Ga
II 1G Ex ia IIC T6 Ga
I M1 Ex ia I Ma
II 3G Ex ic IIC T4 Gc
II 3G Ex ic IIC T6 Gc

DEKRA EXAM GmbH
Bochum, dated 08.08.2012

Certification body

Special services unit

This certificate may only be reproduced in its entirety and without change.
DEKRA EXAM GmbH Dinnendahlstrasse 9 44809 Bochum Phone +49.234.3696-105 Fax +49.234.3696-110 zs-exam@dekra.com

(13) Appendix to

(14) **8. Supplement to the EC-Type Examination Certificate**
BVS 03 ATEX E 406 X

(15) 15.1 Subject and type

Unchanged

15.2 Description

The gas measuring transmitter type P3S, P3U and P3FB (P3U/P3FB alternative with P3U Remote Adapter and P3U Remote Sensor) can be modified according to the descriptive documents as mentioned in the pertinent test and assessment report.

Additional materials can be used optional for the device housing and the bayonet ring for sensor mounting. The additional materials have a surface resistance < 10^9 Ohm too.

15.3 Parameters

Unchanged

(16) Test and Assessment Report

BVS PP 03.2298 EG as of 08.08.2012

(17) Special conditions for safe use

Unchanged

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DEKRA EXAM GmbH Dinnendahlstrasse 9 44809 Bochum Phone +49.234.3696-105 Fax +49.234.3696-110 zs-exam@dekra.com

Metrological certificate of approval

Neutralization measurements for the explosion protection according to BVS 03 ATEX E 406 X and monitoring of oxygen deficiency or excess of oxygen according to EN 50104, PFG No. 41300504.

⚠ CAUTION
Not suitable for use in oxygen-enriched atmospheres, i.e. oxygen content exceeds 21 vol. %. Explosion hazard!

Section 5 of the Suitability Test Report

5. Notes on use

On the basis of the measurement results contained in the test reports with PFG no. 41300504P, 41300504P NI, 41300504P NII and 41300504P NIII and on the basis of the specifications on oxygen measurement in the measuring range 0 to 25 % O2 (with regard to the intended use of monitoring the ambient air for lacking or excess oxygen), the transmitter P3U (Polytron 7000) of the company Dräger Safety AG & Co. KGaA is appropriate if its characteristics and design correspond to the documents mentioned in the test reports with PFG no. 41300504P, 41300504P NI, 41300504P NII and 41300504P NIII, if it is operated accordingly and if the following terms are met:

— The operating instructions supplied to the EXAM and having been checked have to be strictly observed. When using the gas detector, ensure that the operating conditions are complied with as contained in the operating instructions.

— The relay module only must be operated with devices of the software versions 7.8, 7.9 or 8.0 (main).

— Alarms only must be configured as "non-acknowledgeable".

— When using the pump module, the flow alarm has to be activated (software versions 7.8 or 7.9 (main)).

— Using the sensor O2 LS in connection with the pump module only is allowed at vibration-free installation places.

— Before using the gas detector, check if the configuration times are low enough so that the warning function triggered by the device is performed so quickly that safety-critical situations can be avoided. If required, the alarm setpoint has to be set significantly above (if required, depending on the application, also below) the safety-related limit value.

— The BG information BGI 836 (3) has to be observed.

— The devices have to be provided with a permanent type plate which contains the following information next to information about the manufacturer, the type and the manufacturing number:
"PFG no. 41300504"

— Other labelling regulations remain unaffected by this specification. By means of this type plate, the manufacturing company confirms that the devices dispose of the properties and technical characteristics described in this report. Each device which is not provided with this type plate does not correspond to the present report.

— On request, the operator has to receive a complete printout of this report as well as of the reports with the PFG no. 41300504, 41300504 NI and 41300504 NII.

Overview of the adjustment ranges

	page	Adjustment range	Default value	Note
Calibration gas concentration	52	3,750 ppm to 262,500 ppm 2,997 ppm to 1,050,000 ppm	209,000 ppm 209,000 ppm	for DrägerSensor O_2-LS (6809630) for DrägerSensor O_2 (6809720)
A1 alarm threshold	57	999 ppm to 250,000 ppm 999 ppm to 1,000,000 ppm	190,000 ppm 190,000 ppm	for DrägerSensor O_2-LS (6809630) for DrägerSensor O_2 (6809720)
A1 alarm direction	57	exceeding/falling below	falling below falling below	for DrägerSensor O_2-LS (6809630) for DrägerSensor O_2 (6809720)
A1 alarm latching	57	latching/non-latching	latching latching	for DrägerSensor O_2-LS (6809630) for DrägerSensor O_2 (6809720)
A1 alarm acknowledgement	58	acknowledgeable/not acknowledgeable	not acknowledgeable/ not acknowledgeable	for DrägerSensor O_2-LS (6809630) for DrägerSensor O_2 (6809720)
A1 alarm hysteresis	58	dropping below A1 alarm: 999 ppm to 2,500,000 ppm – A1 999 ppm to 1,000,000 ppm – A1 exceeding A1 alarm: 999 ppm to A1 – 999 ppm 999 ppm to A1 – 999 ppm	 0 ppm 0 ppm 0 ppm 0 ppm	 for DrägerSensor O_2-LS (6809630) for DrägerSensor O_2 (6809720) for DrägerSensor O_2-LS (6809630) for DrägerSensor O_2 (6809720)
A2 alarm threshold	58	999 ppm to 250,000 ppm 999 ppm to 1,000,000 ppm	230,000 ppm 230,000 ppm	for DrägerSensor O_2-LS (6809630) for DrägerSensor O_2 (6809720)
A2 alarm direction	58	exceeding/falling below	exceeding exceeding	for DrägerSensor O_2-LS (6809630) for DrägerSensor O_2 (6809720)
A2 alarm latching	58	latching/non-latching	latching latching	for DrägerSensor O_2-LS (6809630) for DrägerSensor O_2 (6809720)
A2 alarm acknowledgement	58	acknowledgeable/not acknowledgeable	not acknowledgeable/ not acknowledgeable	for DrägerSensor O_2-LS (6809630) for DrägerSensor O_2 (6809720)
A2 alarm hysteresis	58	dropping below A2 alarm: 999 ppm to 2,500,000 ppm – A2 999 ppm to 1,000,000 ppm – A2 exceeding A2 alarm: 999 ppm to A2 – 999 ppm 999 ppm to A2 – 999 ppm	 0 ppm 0 ppm 0 ppm 0 ppm	 for DrägerSensor O_2-LS (6809630) for DrägerSensor O_2 (6809720) for DrägerSensor O_2-LS (6809630) for DrägerSensor O_2 (6809720)
Analogue measuring range	64	49,988 ppm to 250,000 ppm 49,988 ppm to 1,000,000 ppm	250,000 ppm 250,000 ppm	for DrägerSensor O_2-LS (6809630) for DrägerSensor O2 (6809720)
Settings for calibration interval	70	0 to 540 days 0 to 366 days	270 days 183 days	for DrägerSensor O_2-LS (6809630) for DrägerSensor O_2 (6809720)
Pump output	56	0 % to 100 %	30 %	
Alarm	57	On / Off	ON	
Set acknowledgement	58	On / Off	ON	
Warning on/off	64	On / Off	Off	
Warning interval T1	65	2 s to 60 s	10 s	
Warning interval T2	65	1 s to 59 s	1 s	
Warning level	65	3 mA to 22 mA	3 mA	
Maintenance level	65	3 mA to 22 mA (2-wire) 1 mA to 22 mA (3-wire)	3.4 mA	
Autocalibration setting	68	On / Off	Off	
– Sensor test setting	69	On / Off	ON	
Sensor lock	69	On / Off	Off	
Logger on/off	71	On / Off	ON	
Peak / average	72	Peak value/ average value	Average	
Trigger on/off	72	On / Off	ON	
Trigger value	72	0 % to 20 %	1 %	
Stack/roll	73	overwrite/hold	Roll	
Offset current	74	-0.5 mA to +0.5 mA	0 mA	
Display of operating mode		Standard / no display	Standard	
Relay setting		Normally excited / excitation after alarm	Normally excited	
Contrast	68	0 to 100 %	33 %	

Information on DrägerSensor O_2 (6809720)

Principle of measurement:	The DrägerSensor O_2 (6809720) is an electrochemical two-electrode-sensor for measurement of oxygen (O_2) in air. The sensor can only be operated in connection with a suitable Dräger transmitter.
Reaction at the measuring electrode:	$O_2 + 2\ H_2O + 4\ e^- \Rightarrow 4\ OH^-$
Reaction at the counter-electrode:	$2\ Pb \Rightarrow 2\ Pb_2+ + 4\ e^-$
Ambient conditions:	
Operational Characteristics	–5 °C to 40 °C, temporarily –20 °C to 55 °C
	700 hPa to 1300 hPa
	10 to 95 % relative humidity, non condensing
Storage	0 °C to 40 °C
	700 hPa to 1300 hPa
	30 to 70 % relative humidity, non condensing
Measured value time setting:	
$t_{0...20}$	<12 seconds
$t_{0...90}$	<30 seconds
	Note: In the case of temperatures below –5 °C, the measured value time setting may increase.
Calibration:	
Flow rate:	0.5 L/min
Zero gas	Nitrogen (99.9 Vol.-% N_2)
Calibration gas	Oxygen / nitrogen – mixed gas
Warming-up time:	
Sensor is ready to operate after	≤15 minutes
Sensor is ready to calibrate after	≤2 hours

Cross sensitivities

No cross sensitivities against pollution gases with a range up to 100 ppm. For gases in a concentration range larger than 1 Vol.-%: see table. The influence of the O_2 displacement is in not taken into account in the table (partial pressure measurement).

Gas / vapour	Chemical symbol	Gas concentration	Measurement value deviation in Vol.-% O_2
acetone	CH_3COCH_3	1 Vol.-%	≤ 0.1
ethane	C_2H_6	10 Vol.-%	≤ 0.1
ethanol	C_2H_5OH	1 Vol.-%	≤ 0.1
ethylene	C_2H_4	5 Vol.-%	≤ 0.1
ethine	C_2H_2	2 Vol.-%	≤ 0.1
carbon dioxide	CO_2	5 Vol.-%	≤ 0.1
carbon monoxide	CO	1 Vol.-%	≤ 0.1
methane	CH_4	10 Vol.-%	≤ 0.1
methanol	CH_3OH	1 Vol.-%	≤ 0.1
propane	C_3H_8	5 Vol.-%	≤ 0.1
hydrogen	H_2	10 Vol.-%	≤ 0.1

Increased sensor drift can be caused by high sour gas concentrations (> 1 Vol.-%), which could make shorter calibration intervals necessary. The sensor service life is reduced in dependence on the duration and the concentration of the sour gases (e.g. lifetime in atmospheres containing CO_2: 5000 Vol.-% CO_2 x hours).
Organic solvents (e.g. acetone, propyl alcohol, etc.) dissolve in the plastic parts of the sensor. If allowed to react over several days in larger concentrations (> 1 Vol.-%), these substances can cause sensor drift can which could make shorter calibration intervals necessary. This will not reduce the sensor service life.

Information on DrägerSensor O_2-LS (6809630)

Principle of measurement:	The DrägerSensor O_2-LS (6809630) is an electrochemical three-electrode-sensor for measurement of oxygen (O_2) in air. The sensor can only be operated in connection with a suitable Dräger transmitter. The sensor cannot be used for oxygen measurements in the presence of helium!
Reaction at the measuring electrode:	$O_2 + 4\ H^+ + 4\ e^- \Rightarrow 2\ H_2O$
Reaction at the counter-electrode:	$2\ H_2O \Rightarrow O_2 + 4\ H^+ + 4\ e^-$
Ambient conditions:	
Operational Characteristics	-40 °C to 60 °C, short-term up to 65 °C
	700 hPa to 1300 hPa
	5 to 95 % relative humidity, non condensing
storage (in original packaging)	0 °C to 40 °C
Measured value time setting:	
$t_{0...20}$:	<12 seconds
$t_{0...90}$	<30 seconds
Calibration:	
Flow rate:	0.5 L/min
Zero gas	Nitrogen (99.9 Vol.-% N_2)
Calibration gas	Oxygen / nitrogen - mixed gas
Warming-up time:	
Sensor is ready to operate after	≤90 minutes
Sensor is ready to calibrate after	≤6 hours

Cross sensitivities

The table shows the reactions of the sensor to other gases than the measured gas (cross sensitivities). The listed values are typical and are valid for new sensors. The table does not lay a claim on completeness. Gas mixtures can be displayed as the sum of all components. Gases with negative sensitivity can cancel out a positive sensor display. The influence of the O_2 displacement is in not taken into account in the table.
Example:
With 2 Vol.-% ethylene in the air – measurement value deviation due to cross sensitivities (table value) = –1 Vol.-% O_2
O_2 displacement caused by 2 Vol.-% ethylene (2% of 20 Vol.-% O_2) = –0.4 Vol.-% O_2
Polytron transmitter display (20.9 – 1 – 0.4) = 19.5 Vol.-% O_2.

Gas / vapour	Chemical symbol	Gas concentration	Measurement value deviation in Vol.-% with dust filter
acetaldehyde	CH_3CHO	50 ppm	no influence
acrylonitrile	$H_2C{=}CH{-}CN$	80 ppm	no influence
ammonia	NH_3	50 ppm	no influence
arseniuretted hydrogen	AsH_3	3 ppm	no influence
butadiene	$CH_2CHCHCH_2$	50 ppm	no influence
tert-butylmercaptane	$(CH_3)_3CSH$	4 ppm	no influence
chlorine	Cl_2	8 ppm	no influence
hydrogen chloride	HCl	20 ppm	no influence
hydrocyanic acid	HCN	20 ppm	no influence
boroethane	B_2H_6	5 ppm	no influence
1.1-dichloroethane	$C_2H_4Cl_2$	50 ppm	no influence
diethylamine	$(C_2H_5)_2NH$	100 ppm	no influence
diethyl ether	$(C_2H_5)_2O$	400 ppm	≤ 0.1 (–) *
epichlorhydrine	$C_2H_3OCH_2Cl$	35 ppm	no influence
ethanol	C_2H_5OH	250 ppm	no influence

Gas / vapour	Chemical symbol	Gas concentration	Measurement value deviation in Vol.-% with dust filter
ethylene	C_2H_4	2 Vol.-%	≤ 1 (–) *
ethine	C_2H_2	1 Vol.-%	≤ 0.5 (–) *
ethylene oxide	C_2H_4O	20 ppm	≤ 2 (–) *
hydrogen fluoride	HF	15 ppm	no influence
formaldehyde	HCHO	40 ppm	no influence
carbon dioxide	CO_2	5 Vol.-%	no influence
carbon monoxide	CO	100 ppm	≤ 0.1 (–) *
methyl methacrylate	$CH_2C(CH_3)COOCH_3$	50 ppm	no influence
methylamine	CH_3NH_2	100 ppm	no influence
carbonyl chloride	$COCl_2$	1 ppm	no influence
phosphine	PH_3	10 ppm	no influence
i-propyl alcohol	$(CH_3)_2CHOH$	500 ppm	no influence
propylene	CH_3CHCH_2	50 ppm	≤ 0.2 (–) *
sulphur dioxide	SO_2	20 ppm	no influence
hydrogen sulfide	H_2S	20 ppm	no influence
hydrogen selenide	SeH_2	5 ppm	no influence
hydrosilicon	SiH_4	5 ppm	no influence
nitrogen dioxide	NO_2	50 ppm	no influence
nitrogen monoxide	NO	20 ppm	no influence
styrene	$C_6H_5CHCH_2$	30 ppm	no influence
tetrahydrofurane	C_4H_8O	60 ppm	no influence
tetrahydrothiophene	C_4H_8S	5 ppm	no influence
vinyl chloride	C_2H_3Cl	50 ppm	no influence
hydrogen	H_2	1 Vol.-%	≤ 1.5 (–) *
hydrogen peroxide	H_2O_2	5 ppm	no influence

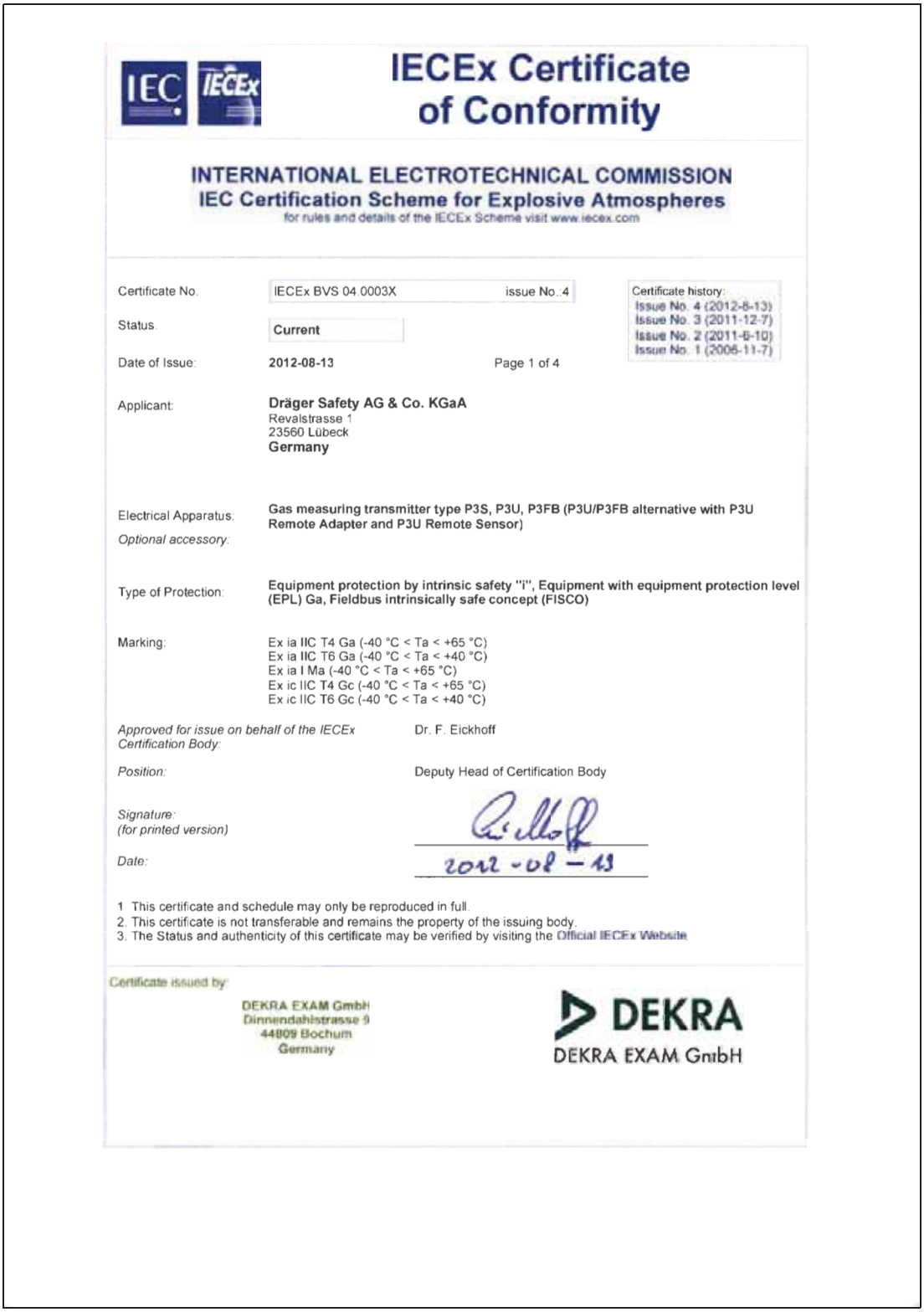
(–) * Negative display.

⚠ CAUTION

The influence of unsaturated hydrocarbons, alcohols or hydrogen in higher concentrations or over a longer period of time (dose approx. 100,000 ppm x hours) will let the sensor drop out.

When used in transmitters with pump module, the O_2 LS sensor (68 09 630) must always be installed at vibration-free locations. If used in this combination, vibrations may cause the measured value to deviate outside of the permissible range.

IECEx approval



IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification Scheme for Explosive Atmospheres

for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.: IECEx BVS 04.0003X issue No.:4

Certificate history:
Issue No. 4 (2012-8-13)
Issue No. 3 (2011-12-7)
Issue No. 2 (2011-6-10)
Issue No. 1 (2006-11-7)

Status: **Current**

Date of Issue: **2012-08-13** Page 1 of 4

Applicant: **Dräger Safety AG & Co. KGaA**
Revalstrasse 1
23560 Lübeck
Germany

Electrical Apparatus: **Gas measuring transmitter type P3S, P3U, P3FB (P3U/P3FB alternative with P3U Remote Adapter and P3U Remote Sensor)**
Optional accessory:

Type of Protection: **Equipment protection by intrinsic safety "i", Equipment with equipment protection level (EPL) Ga, Fieldbus intrinsically safe concept (FISCO)**

Marking:
Ex ia IIC T4 Ga (-40 °C < Ta < +65 °C)
Ex ia IIC T6 Ga (-40 °C < Ta < +40 °C)
Ex ia I Ma (-40 °C < Ta < +65 °C)
Ex ic IIC T4 Gc (-40 °C < Ta < +65 °C)
Ex ic IIC T6 Gc (-40 °C < Ta < +40 °C)

Approved for issue on behalf of the IECEx Certification Body: Dr. F. Eickhoff

Position: Deputy Head of Certification Body

Signature: (for printed version)

Date: 2012-08-13

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting the Official IECEx Website

Certificate issued by:
DEKRA EXAM GmbH
Dinnendahlstrasse 9
44809 Bochum
Germany

DEKRA
DEKRA EXAM GmbH

IECEx Certificate of Conformity

Certificate No.: IECEx BVS 04.0003X

Date of Issue: **2012-08-13** Issue No.: **4**

Manufacturer: **Dräger Safety AG & Co. KGaA**
Revalstrasse 1
23560 Lübeck
Germany

Manufacturing location(s):

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements. This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended.

STANDARDS:
The electrical apparatus and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards:

IEC 60079-0 : 2007-10 Edition: 5	Explosive atmospheres - Part 0:Equipment - General requirements
IEC 60079-11 : 2006 Edition: 5	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"
IEC 60079-26 : 2006 Edition: 2	Explosive atmospheres - Part 26: Equipment with equipment protection level (EPL) Ga
IEC 60079-27 : 2008 Edition: 2.0	Explosive atmospheres - Part 27: Fieldbus intrinsically safe concept (FISCO)

*This Certificate **does not** indicate compliance with electrical safety and performance requirements other than those expressly included in the Standards listed above.*

TEST & ASSESSMENT REPORTS:
A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in

Test Report:
DE/BVS/ExTR06.0003/04

Quality Assessment Report:

DE/BVS/QAR06.0001/07

IECEx Certificate of Conformity

Certificate No.: IECEx BVS 04.0003X

Date of Issue: **2012-08-13** Issue No.: **4**

Schedule

EQUIPMENT:
Equipment and systems covered by this certificate are as follows:

Ratings:
unchanged

Marking:
unchanged

CONDITIONS OF CERTIFICATION: YES as shown below:

In applications, which require devices with EPL Ga (Zone 0), intensive electrostatic charging processes have to be prevented.
The measurement function for explosion protection is not the subject of this supplement to the IECEx Certificate of Conformity.

IECEx Certificate of Conformity

Certificate No.. IECEx BVS 04.0003X

Date of Issue: **2012-08-13** Issue No.. **4**

DETAILS OF CERTIFICATE CHANGES (for issues 1 and above):

For the gas measuring transmitter type P3S, P3U and P3FB (P3U/P3FB alternative with P3U Remote Adapter and P3U Remote Sensor) additional materials can be used optional for the device housing and the bayonet ring for sensor mounting. The additional materials have a surface resistance < 10^9 Ohm too.

UL approval

Underwriters Laboratories Inc.®

Northbrook Division
333 Pfingsten Road
Northbrook, IL 60062-2096 USA
www.ul.com
tel: 1 847 272 8800
fax: 1 847 272 8129
Customer service: 1 877 854 3577

NOTICE OF AUTHORIZATION TO APPLY THE UL MARK

2004-02-12

Mr. Thomas Treptow
Draeger Safety AG & Co KGaA
Revalstrasse 1
23560 Luebeck Germany

Fax number: 49-451-882-73191

Reference: File E180059 Project 03NK30215

Product: Models P3S (Polytron 3000) And P3U (Polytron 7000) Gas Detectors, Intrinsically Safe For Use In Class I, Division 1, Groups A, B, C, D; Class II, Division 1, Groups E, F, G When Connected Per Draeger Control Drawing SE20105

Dear Mr. Treptow,

UL's investigation of your product has been completed under the above project number and the subject product was determined to comply with the applicable requirements.

This letter temporarily supplements the UL Follow-Up Services Procedure and serves as authorization to apply the UL Classification Mark only at the factory under UL's Follow-Up Service Program to the subject product, which is constructed as described below:

> Identical to Model P3U, which was submitted to UL for this investigation and identical to Model P3S (Polytron C) which is covered in Follow-Up Services Procedure, File E180059, Volume 1, Section 2.

This authorization is effective from the date of this Notice and only for products at the indicated manufacturing locations. Records in the Follow-Up Services Procedure covering the product are now being prepared and will be sent to the indicated manufacturing locations in the near future. Please note that Follow-Up Services Procedures are sent to the manufacturers only unless the Applicant specifically requests this document.

Products that bear the UL Mark shall be identical to those that were evaluated by UL and found to comply with UL's requirements. If changes in construction are discovered, appropriate action will be taken for products not in conformance with UL's requirements and continued use of the UL Mark may be withdrawn.

Sincerely,

Frederic J. Cleary
Lead Engineering Associate
Hazardous Locations, Gas & Oil
Conformity Assessment Services
Tel: 847-664-2743
Fax: 847-313-2743
E-mail: Frederic.J.Cleary@us.ul.com

Reviewed by:

Benjamin P. Schaefer
Staff Engineer
Hazardous Locations, Gas & Oil
Conformity Assessment Services
E-mail: benjamin.schaefer@us.ul.com

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fax: 1 847 272 8129
Customer service: 1 877 854 3577

NOTICE OF AUTHORIZATION TO APPLY THE UL MARK

2006-12-07

Mr. Thomas Treptow
Draeger Safety AG & Co. KGaA
Revalstrasse 1
23560 Luebeck
Germany

E-mail: Thomas.Treptow@draeger.com

Reference: File E180059 Project 06NK23867
Product(s): USL - Model P3FB Gas Detector for Use in Class I, Division 1, Groups A, B, C and D and Class II, Division 1, Groups E, F and G Hazardous Locations

Dear Mr. Treptow:

UL's investigation of your product has been completed under the above project number and the subject product was determined to comply with the applicable requirements.

This letter temporarily supplements the UL Follow-Up Services Procedure and serves as authorization to apply the UL Listing Mark only at the factory under UL's Follow-Up Service Program to the subject products, which is are constructed as described below:

> Identical to the model submitted which was to UL for this investigation. The UL records covering the product will be in the Follow-Up Services Procedure, File E180059, Vol. 1, Sec. 2.

This authorization applies only to the address on this letter.

This authorization is effective from the date of this Notice and only for products at the indicated manufacturing locations. Records in the Follow-Up Services Procedure covering the product are now being prepared and will be sent to the indicated manufacturing locations in the near future. Please note that Follow-Up Services Procedures are sent to the manufacturers only unless the Applicant specifically requests this document.

Products that bear the UL Mark shall be identical to those that were evaluated by UL and found to comply with UL's requirements. If changes in construction are discovered, appropriate action will be taken for products not in conformance with UL's requirements and continued use of the UL Mark may be withdrawn.

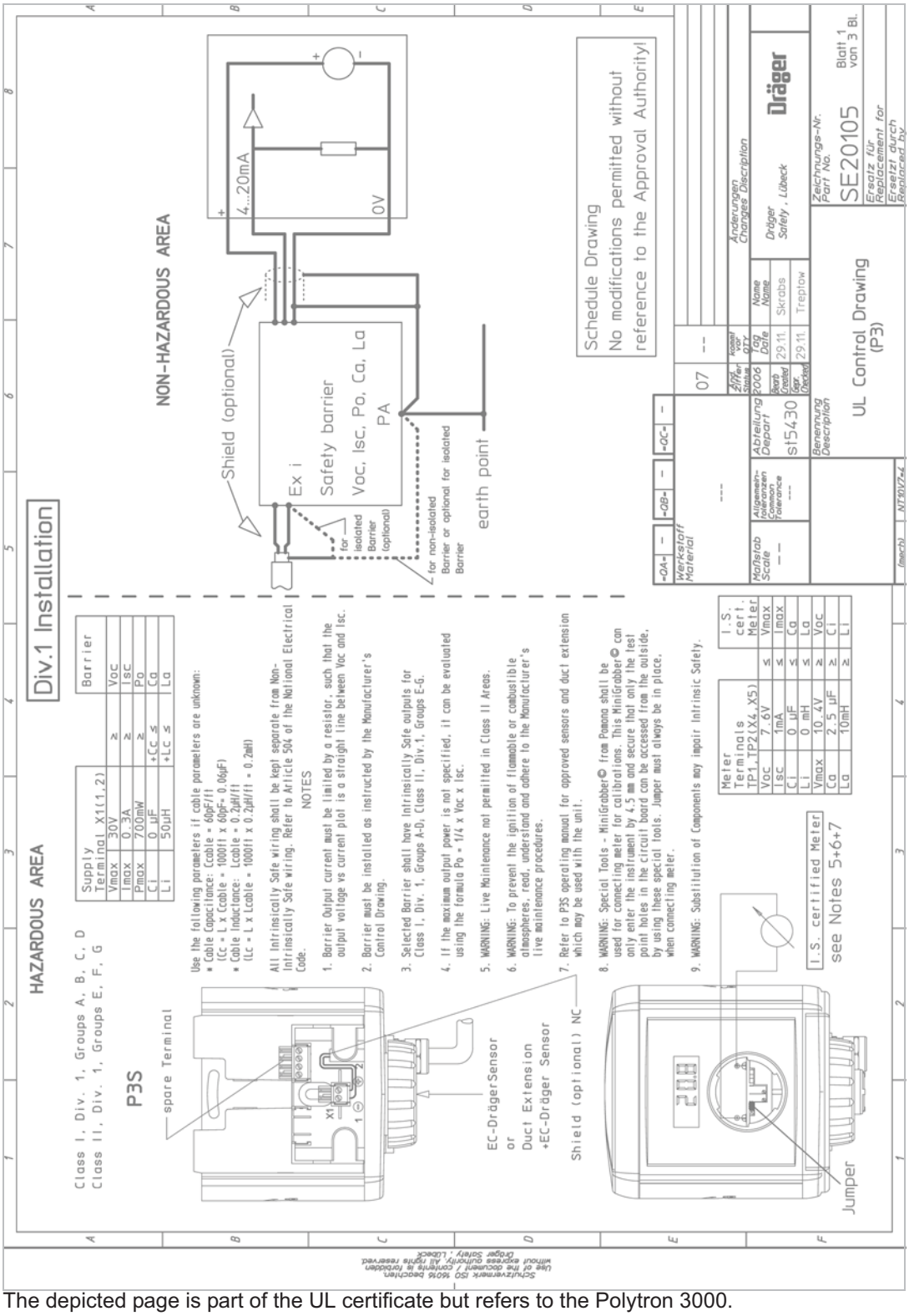
Sincerely,

David P. Malohn
Staff Engineer
Hazardous Locations, Gas & Oil
Conformity Assessment Services

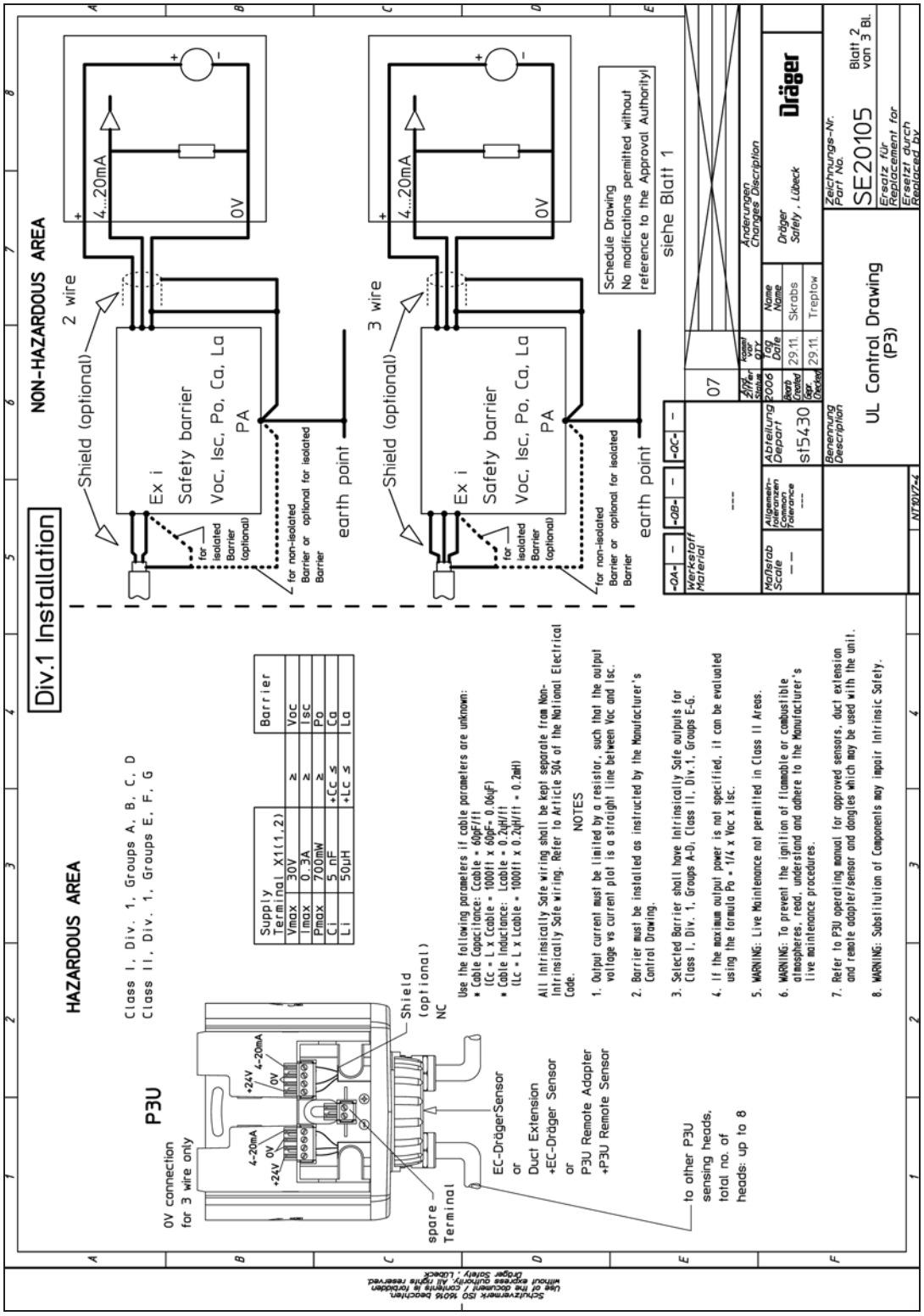
Reviewed by:

Benjamin P. Schaefer
Senior Staff Engineer
Hazardous Locations, Gas & Oil
Conformity Assessment Services

An independent organization working for a safer world with integrity, precision and knowledge.



The depicted page is part of the UL certificate but refers to the Polytron 3000.


Div.1 Installation
HAZARDOUS AREA
NON-HAZARDOUS AREA
Class I, Div. 1, Groups A, B, C, D
Class II, Div. 1, Groups E, F, G
P3U
0V connection for 3 wire only
Shield (optional)
NC
spare Terminal
EC-DrägerSensor or Duct Extension +EC-Dräger Sensor or P3U Remote Adapter +P3U Remote Sensor
to other P3U sensing heads, total no. of heads: up to 8
Supply Terminal X1(1,2)
Vmax 30V
Imax 0.3A
Pmax 700mW
Ci 5 nF
Li 50µH
Barrier
≥ Voc
≥ Isc
≥ Po
+Cc ≤ Ca
+Lc ≤ La
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)
All intrinsically Safe wiring shall be kept separate from Non-Intrinsically Safe wiring. Refer to Article 504 of the National Electrical Code.
NOTES
1. Output current must be limited by a resistor, such that the output voltage vs current plot is a straight line between Voc and Isc.
2. Barrier must be installed as instructed by the Manufacturer's Control Drawing.
3. Selected Barrier shall have Intrinsically Safe outputs for Class I, Div. 1, Groups A-D, Class II, Div.1, Groups E-G.
4. If the maximum output power is not specified, it can be evaluated using the formula Po = 1/4 x Voc x Isc.
5. WARNING: Live Maintenance not permitted in Class II Areas.
6. WARNING: To prevent the ignition of flammable or combustible atmospheres, read, understand and adhere to the Manufacturer's live maintenance procedures.
7. Refer to P3U operating manual for approved sensors, duct extension and remote adapter/sensor and dongles which may be used with the unit.
8. WARNING: Substitution of Components may impair Intrinsic Safety.
2 wire
3 wire
Ex i
Safety barrier
Voc, Isc, Po, Ca, La
PA
4...20mA
0V
for isolated Barrier (optional)
for non-isolated Barrier or optional for isolated Barrier
earth point
Schedule Drawing
No modifications permitted without reference to the Approval Authority!
siehe Blatt 1
UL Control Drawing
(P3)
Dräger Safety , Lübeck
Dräger
Zeichnungs-Nr.
Part No.
SE20105
Blatt 2 von 3 Bl.
Ersatz für
Replacement for
Ersetzt durch
Replaced by
Änderungen
Changes Description
Name
Tag
Date
Skrabs
Treplow
29.11.
Abteilung
Depart
st5430
Benennung
Description
Maßstab
Scale
Werkstoff
Material
NT6V7-4
Schutzvermerk ISO 16016 beachten.
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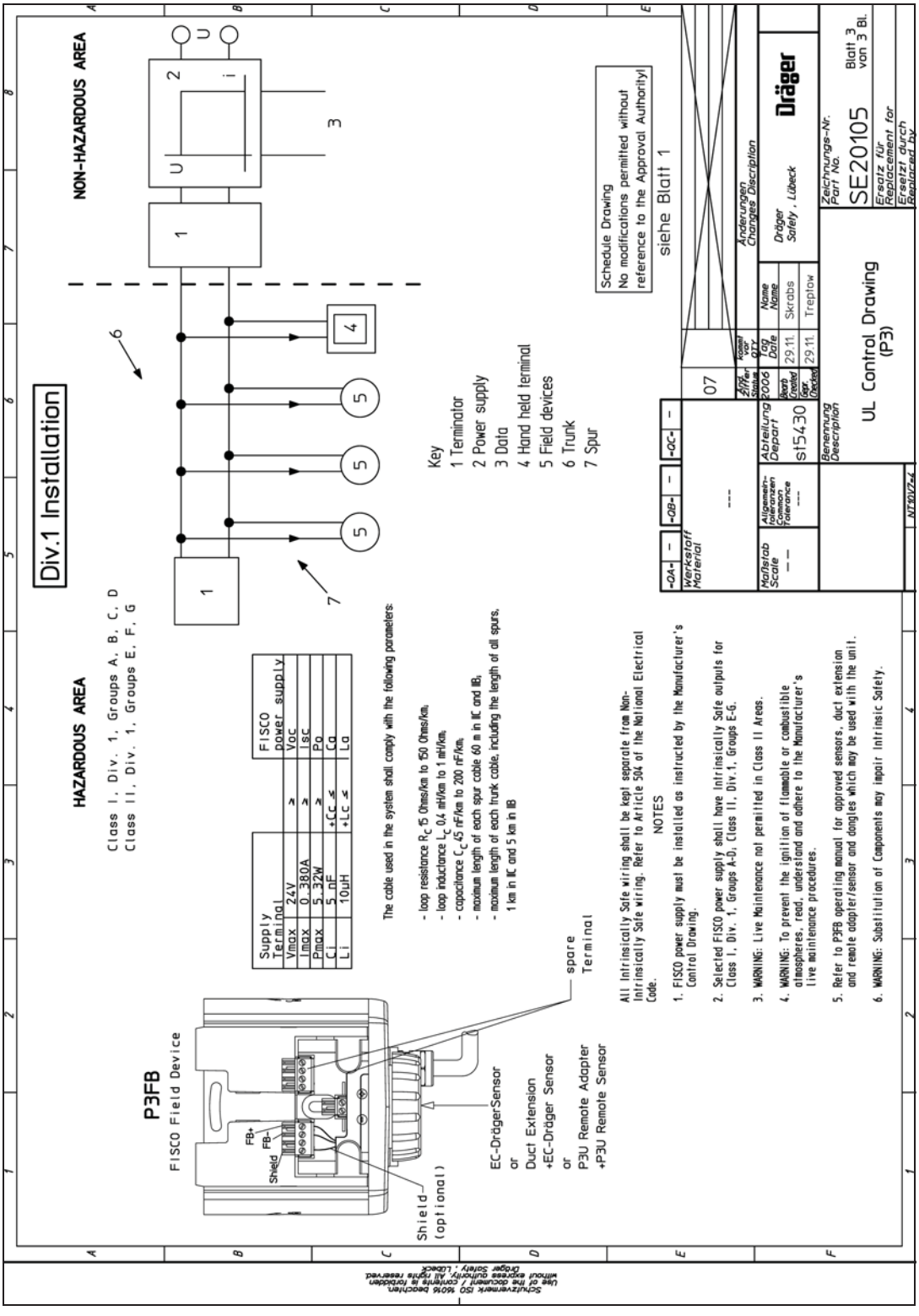
Div.1 Installation
HAZARDOUS AREA
Class I, Div. 1, Groups A, B, C, D
Class II, Div. 1, Groups E, F, G
NON-HAZARDOUS AREA
P3FB
FISCO Field Device
FB+
FB-
Shield
Shield (optional)
EC-DrägerSensor or Duct Extension +EC-Dräger Sensor or P3U Remote Adapter +P3U Remote Sensor
spare Terminal
Supply Terminal
FISCO power supply
Vmax 24V ≥ Voc
Imax 0.380A ≥ Isc
Pmax 5.32W ≥ Po
Ci 5 nF +Cc ≤ Ca
Li 10µH +Lc ≤ La
The cable used in the system shall comply with the following parameters:
- loop resistance Rc 15 Ohms/km to 150 Ohms/km.
- loop inductance Lc 0.4 mH/km to 1 mH/km.
- capacitance Cc 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
UL Control Drawing (P3)
Änderungen Changes Description
Name Name
Tag Date
Dräger Safety, Lübeck
Dräger
Zeichnungs-Nr. Part No
SE20105
Blatt 3 von 3 Bl.
Ersatz für Replacement for
Ersetzt durch Replaced by
Abteilung Depart
st5430
Benennung Description
Werkstoff Material
Maßstab Scale
Allgemeintoleranzen Generaltolerance Toleranz
Schutzvermerk ISO 16016 beachten
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CSA approval

CSA INTERNATIONAL

Certificate of Compliance

Certificate: 1562835 (LR 97594) **Master Contract:** 160220

Project: 1856978 **Date Issued:** 2007/01/24

Issued to: **Draeger Canada Limited**
7555 Danbro Cres
Mississauga, ON L5N 6P9
Canada
Attention: Mr. Sasha Vuksanov

The products listed below are eligible to bear the CSA Mark shown with adjacent indicator 'NRTL/C'

NRTL/C

Issued by: Glenn Black

Authorized by: Patricia Pasemko, Operations Manager

PRODUCTS

CLASS 4828 82 - SIGNAL APPLIANCES-Toxic Gas Detection Instruments - For Hazardous Locations. Certified to U.S. Standards

CLASS 4828 02 - SIGNAL APPLIANCES - Toxic Gas Detection Instruments - For Hazardous Locations

Class I, Groups A, B, C and D; Class II, Groups E, F and G:

Model P3S, stationary, input rated 30 V dc max., 0.3 A max., intrinsically safe with entity parameters when installed in accordance with Draeger Control Drawing No. SE20106. May be used with duct extension. Temperature Code T4 for ambient temperatures of –40 Deg. C to +65 Deg C. Temperature Code T6 for

The 'NRTL/C' indicator adjacent to the CSA Mark signifies that the product has been evaluated to the applicable ANSI/UL and CSA Standards, for use in the U.S. and Canada. NRTL, i.e. National Recognized Testing Laboratory, is a designation granted by the U.S. Occupational Safety and Health Administration (OSHA) to laboratories which have been recognized to perform certification to U.S. Standards.

DQD 507 Rev. 2004-06-30

CSA INTERNATIONAL

Certificate: 1562835 (LR 97594) **Master Contract:** 160220

Project: 1856978 **Date Issued:** 2007/01/24

ambient temperatures of –40 Deg. C to +40 Deg C.

Model P3U, stationary, input rated 30 V dc max., 0.3 A max., intrinsically safe with entity parameters when installed in accordance with Draeger Control Drawing No. SE20106. May be used with duct extension, P3U Remote Adapter, P3U Remote Sensor and Dongles. Temperature Code T4 for ambient temperatures of –40 Deg. C to +65 Deg C. Temperature Code T6 for ambient temperatures of –40 Deg. C to +40 Deg C.

Model P3FB, stationary, input rated 24 V dc max., 0.38 A max., intrinsically safe with entity parameters when installed in accordance with Draeger Control Drawing No. SE20106. May be used with duct extension, P3U Remote Adapter, P3U Remote Sensor and Dongles. Temperature Code T4 for ambient temperatures of –40 Deg. C to +65 Deg C. Temperature Code T6 for ambient temperatures of –40 Deg. C to +40 Deg C.

APPLICABLE REQUIREMENTS

CAN/CSA-C22.2 No.157-92 - Intrinsically Safe and Non-Incendive Equipment for Use in Hazardous Locations

CSA Std C22.2 No.142-M1987 - Process Control Equipment

UL Std No. 508, July 11, 2005 - Industrial Control Equipment

UL Std No. 913, August 9, 2004 - Intrinsically Safe Apparatus and Associated Apparatus for Use in Class I, II and III, Division 1, Hazardous Locations

MARKINGS

- CSA Monogram with NRTL/C indicator;
- Submittor Identification;
- Model Number;
- Serial Number, Date Code or Month and Year of Manufacture;
- Hazardous locations designation;
- Electrical rating;
- The words "Intrinsically Safe";
- The symbol "Exia";
- Reference to Installation Instructions;
- Temperature Code;
- Warning: Substitution of components may impair intrinsic safety;

DQD 507 Rev. 2004-06-30

CSA INTERNATIONAL

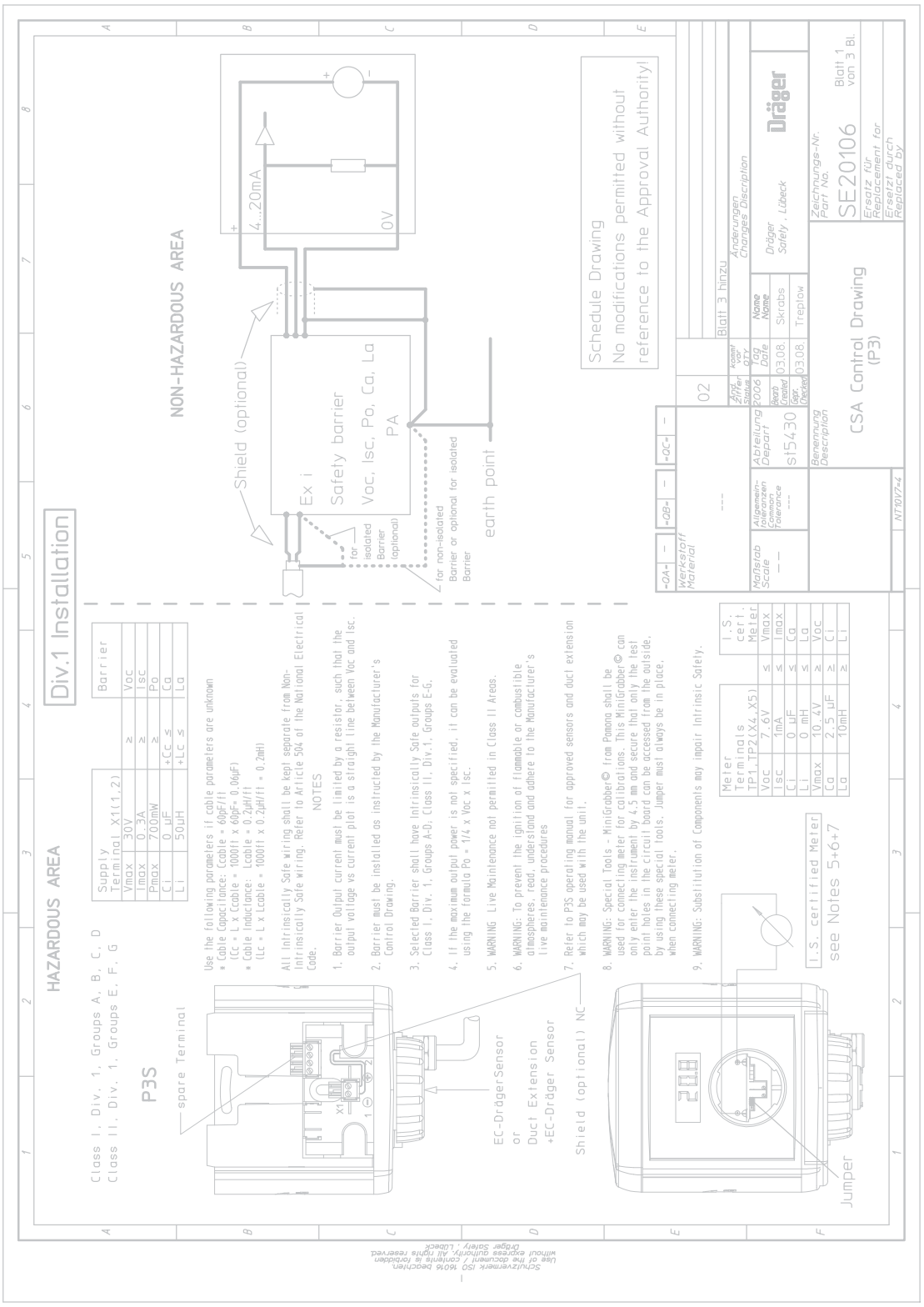
Supplement to Certificate of Compliance

Certificate: 1562835 **Master Contract:** 160220

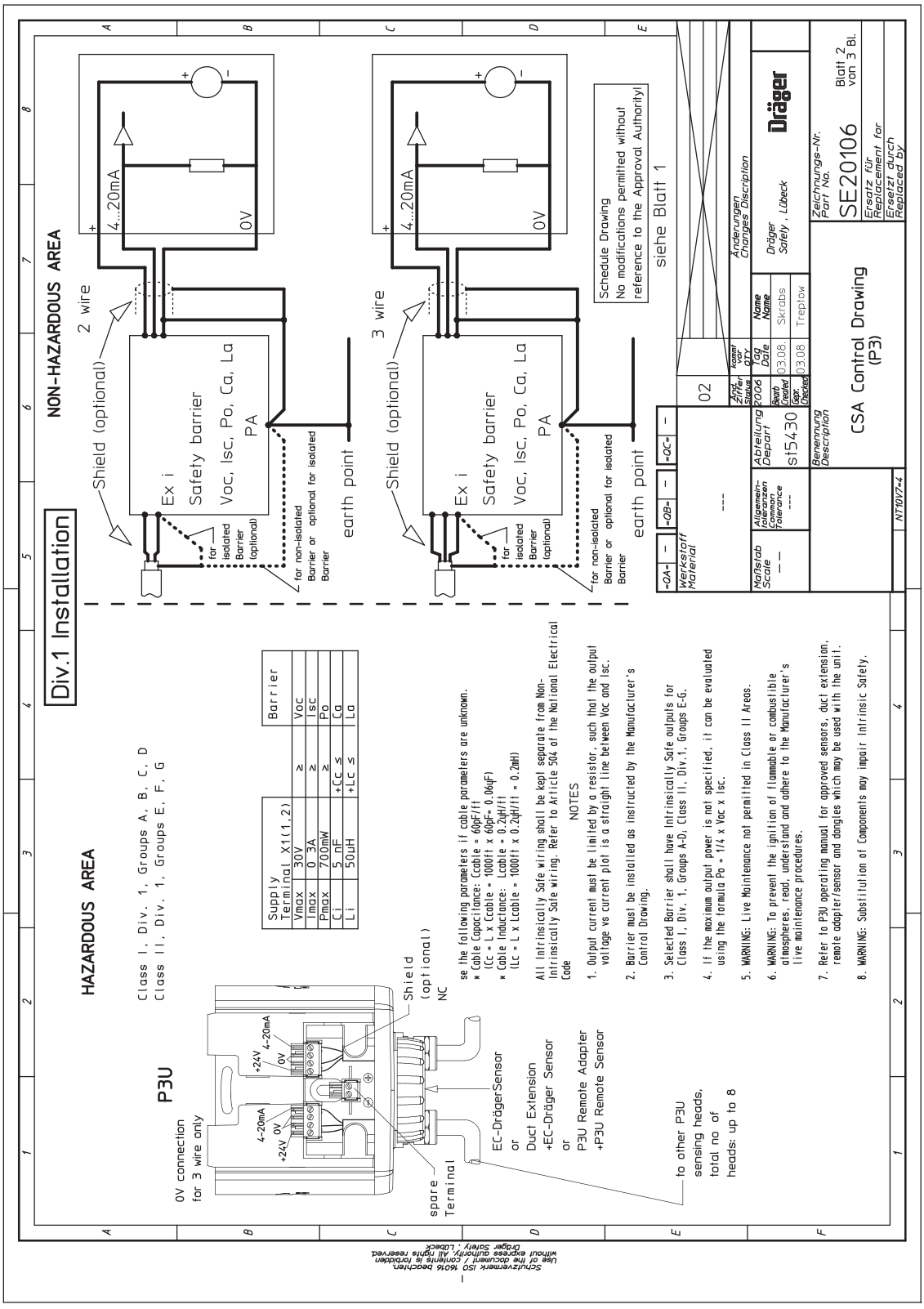
The products listed, including the latest revision described below, are eligible to be marked in accordance with the referenced Certificate.

Product Certification History

Project	Date	Description
1856978	2007/01/24	Addition of model P3FB
1562835	2004/11/09	Original Certification of P3S and P3U



The depicted page is part of the CSA certificate but refers to the Polytron 3000.


Div.1 Installation
HAZARDOUS AREA
NON-HAZARDOUS AREA
Class I, Div. 1, Groups A, B, C, D
Class II, Div. 1, Groups E, F, G
2 wire
3 wire
4...20mA
0V
Shield (optional)
Ex i
Safety barrier
Voc, Isc, Po, Ca, La
PA
for isolated Barrier (optional)
for non-isolated Barrier or optional for isolated Barrier
earth point
Schedule Drawing
No modifications permitted without reference to the Approval Authority!
siehe Blatt 1
P3U
0V connection for 3 wire only
+24V
0V
4-20mA
Shield (optional)
NC
spare Terminal
EC-DrägerSensor or Duct Extension +EC-Dräger Sensor or P3U Remote Adapter +P3U Remote Sensor
to other P3U sensing heads, total no of heads: up to 8
Supply Terminal X1(1,2)
Vmax 30V ≥ Voc
Imax 0.3A ≥ Isc
Pmax 700mW ≥ Po
Ci 5 nF +Cc ≤ Ca
Li 50µH +Lc ≤ La
Barrier
All Intrinsically Safe wiring shall be kept separate from Non-Intrinsically Safe wiring. Refer to Article 504 of the National Electrical Code
NOTES
1. Output current must be limited by a resistor, such that the output voltage vs current plot is a straight line between Voc and Isc.
2. Barrier must be installed as instructed by the Manufacturer's Control Drawing.
3. Selected Barrier shall have Intrinsically Safe outputs for Class I, Div. 1, Groups A-D, Class II, Div.1, Groups E-G.
4. If the maximum output power is not specified, it can be evaluated using the formula Po = 1/4 x Voc x Isc.
5. WARNING: Live Maintenance not permitted in Class II Areas.
6. WARNING: To prevent the ignition of flammable or combustible atmospheres, read, understand and adhere to the Manufacturer's live maintenance procedures.
7. Refer to P3U operating manual for approved sensors, duct extension, remote adapter/sensor and dongles which may be used with the unit.
8. WARNING: Substitution of Components may impair Intrinsic Safety.
Änderungen
Changes
Discription
Name
Tag
Date
Dräger
Safety , Lübeck
Skrabs
Treplow
03.08.
03.08
Abteilung
Depart
st5430
Benennung
Description
CSA Control Drawing
(P3)
Zeichnungs-Nr.
Part No.
SE20106
Blatt 2
von 3 Bl.
Ersatz für
Replacement for
Ersetzt durch
Replaced by
NT1017+4
Schutzvermerk ISO 16016 beachten.
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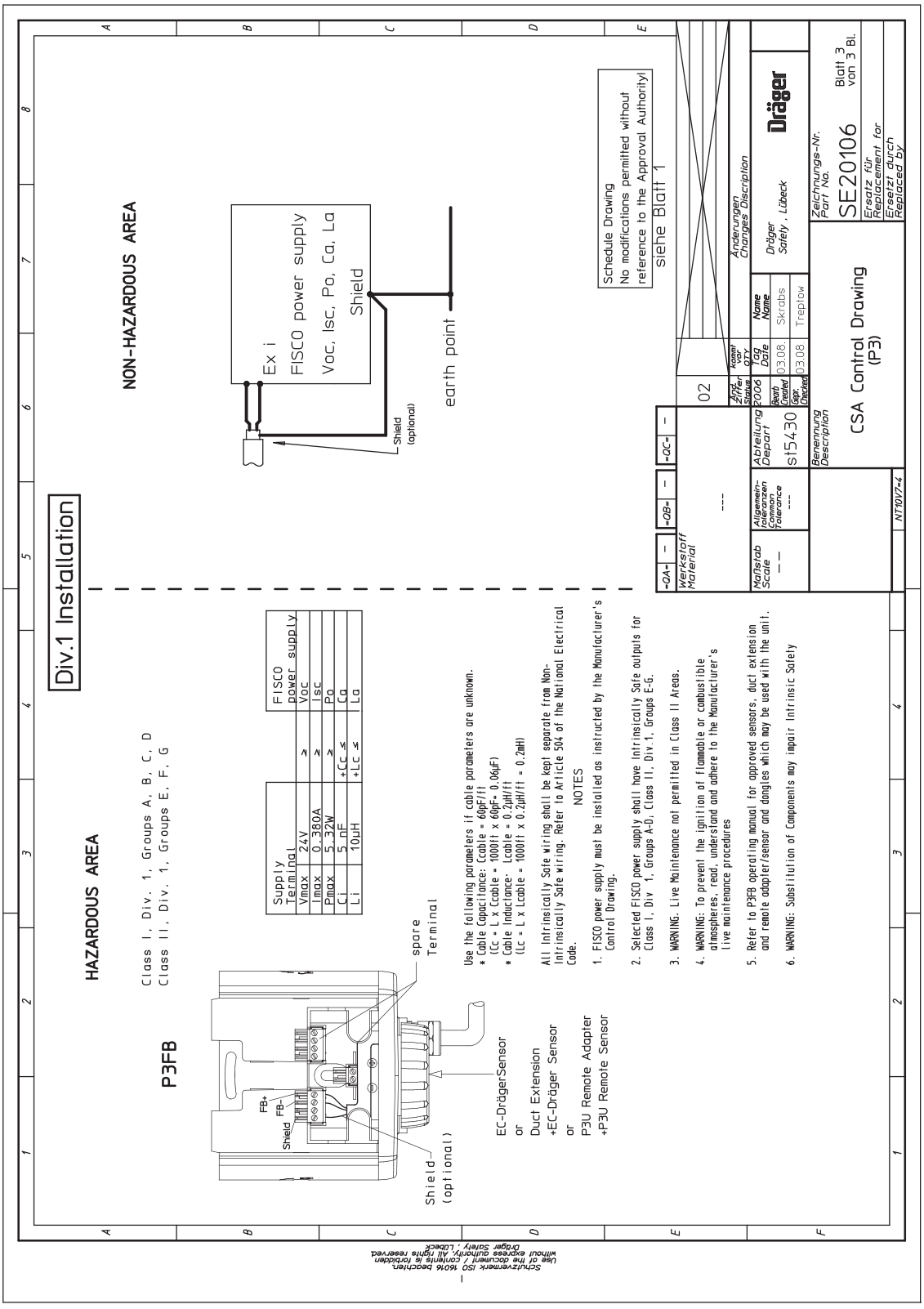
Dräger Safety, Lübeck


HAZARDOUS AREA
NON-HAZARDOUS AREA
Div.1 Installation
Class I, Div. 1, Groups A, B, C, D
Class II, Div. 1, Groups E, F, G
P3FB
Supply Terminal
FISCO power supply
Vmax 24V ≥ Voc
Imax 0.380A ≥ Isc
Pmax 5.32W ≥ Po
Ci 5.nF +Cc ≤ Ca
Li 10µH +Lc ≤ La
Ex i
FISCO power supply
Voc, Isc, Po, Ca, La
Shield
Shield (optional)
earth point
spare Terminal
Shield (optional)
FB+
FB-
Shield
EC-Dräger Sensor
or
Duct Extension
+EC-Dräger Sensor
or
P3U Remote Adapter
+P3U Remote Sensor
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)
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
Schedule Drawing
No modifications permitted without reference to the Approval Authority!
siehe Blatt 1
-QA- -QB- -QC-
Werkstoff Material
Maßstab Scale
Allgemeintoleranzen Commun Tolerance
Abteilung Depart
st5430
Benennung Description
CSA Control Drawing
(P3)
Änderungen Changes Discription
Name
Dräger Safety, Lübeck
Dräger
Zeichnungs-Nr. Part No.
SE20106
Blatt 3 von 3 Bl.
Ersatz für Replacement for
Ersetzt durch Replaced by
NT1017=4
Schutzvermerk ISO 16016 beachten.
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Dräger Safety, Lübeck

Declaration of Conformity

EG-Konformitätserklärung
EC-Declaration of Conformity

Dokument Nr. / *Document No.* SE20148-03

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 EG-Baumusterprüfbescheinigung
is in conformity with the EC-Type Examination Certificate **BVS 03 ATEX E 406 X**

ausgestellt von der benannten Stelle
issued by the Notified Body **DEKRA EXAM GmbH, Dinnendahlstraße 9, D-44809 Bochum**

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

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** [1] *94/9/EC: ATEX Directive* [1]	EN 60079-0:2009, EN 60079-11:2007, EN 60079-26:2007, EN 60079-27:2008, EN 50303:2000
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** [2] *2006/95/EC: Low Voltage Directive* [2]	EN 61010-1:2010

[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*

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, 2012-01-19

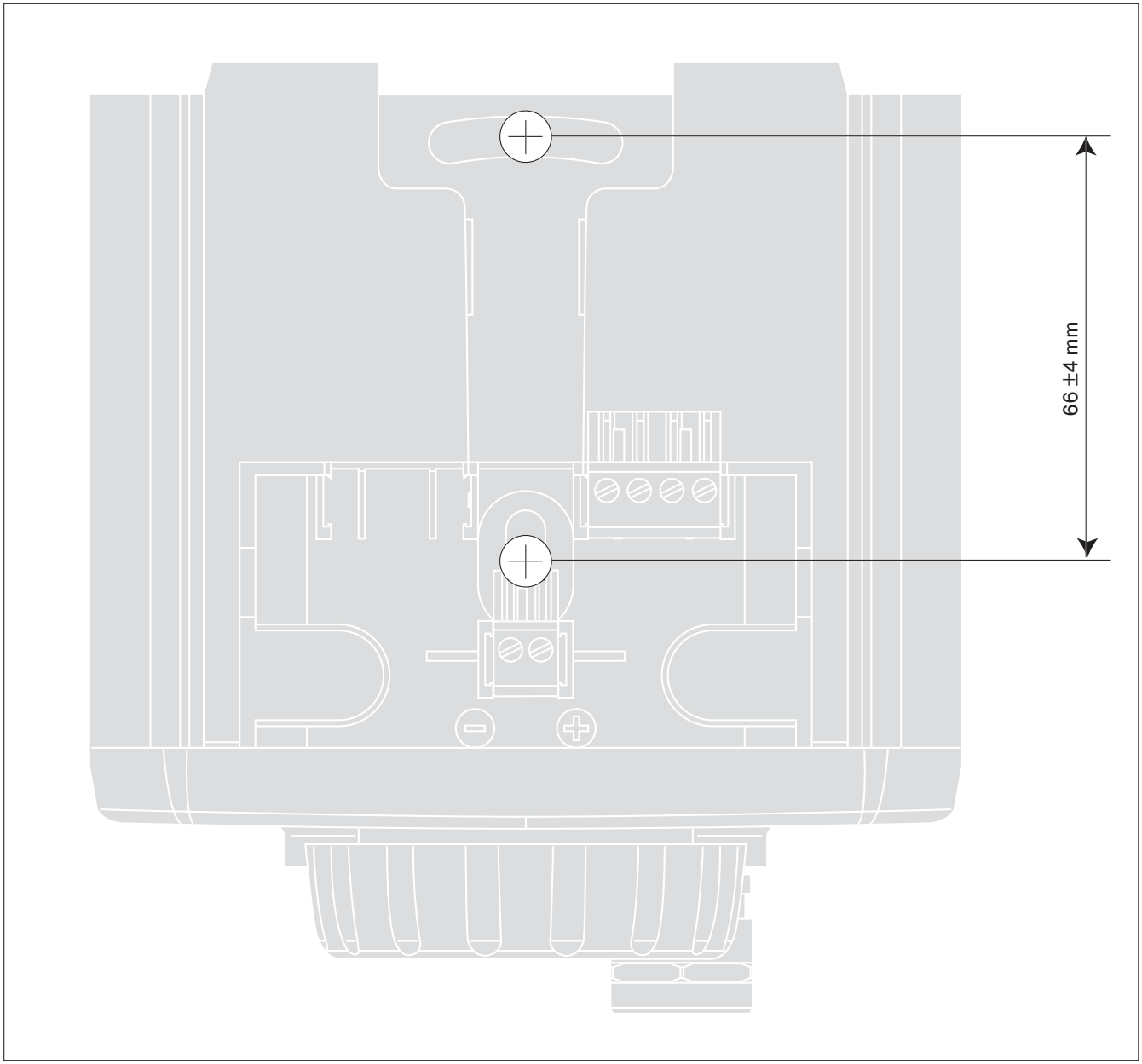
Ort und Datum (jjjj-mm-tt)
Place and date (yyyy-mm-dd)

Ingo Pooch
Leiter
Forschung & Entwicklung
Gasmessgeräte

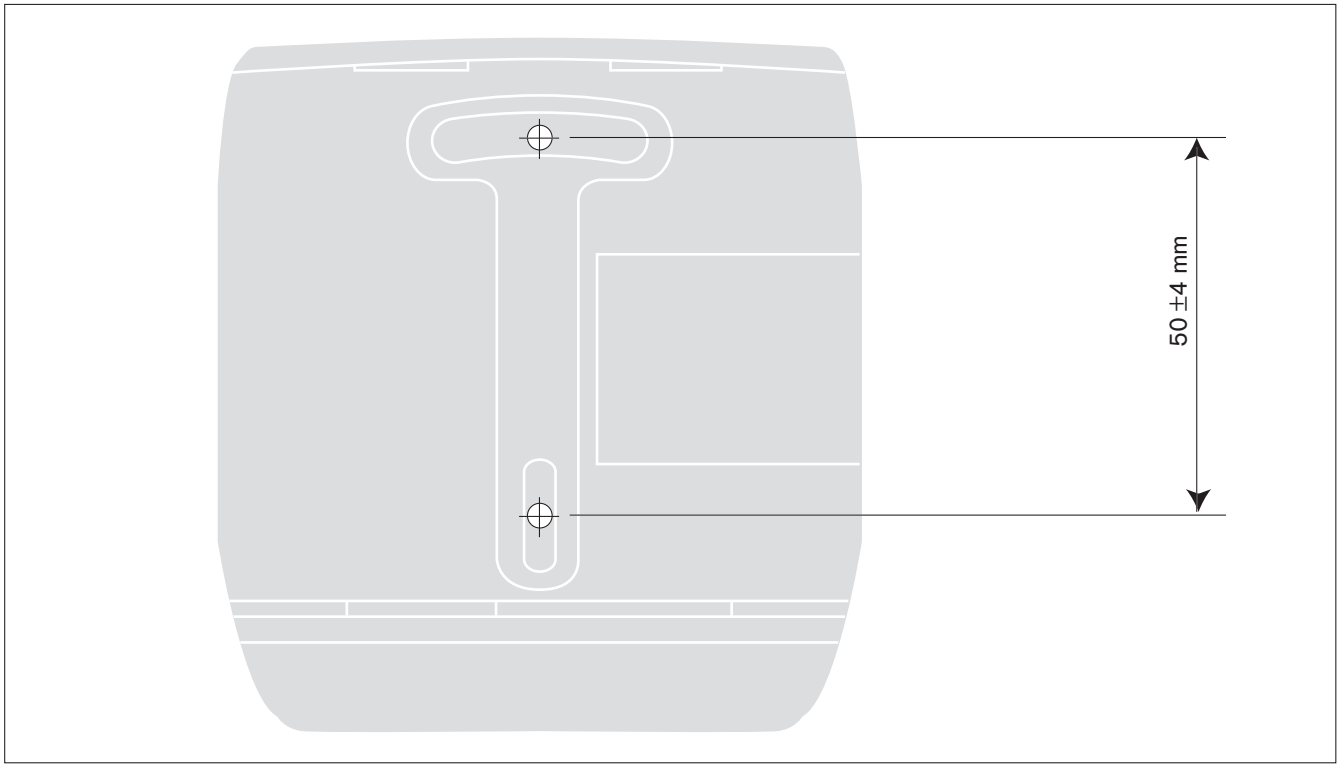
Ingo Pooch
Manager
Research & Development
Gas Detection Instruments

Drilling templates

Dräger docking station



Remote sensor



Duct adapter