

## Dräger Polytron 3000

(approved as type P3S)

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 de-classified). Explosion hazard!**

### **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.

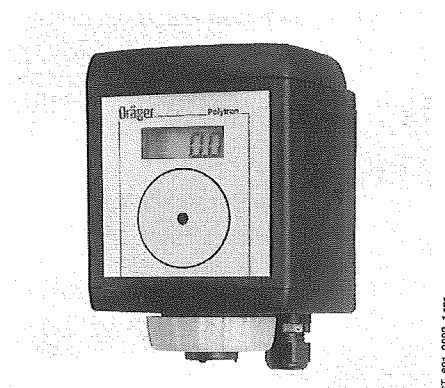
Dräger cannot be held responsible for damage caused by non-compliance with the recommendations given above. The warranty and liability provisions of the terms of sale and delivery of Dräger are likewise not modified by the recommendations given above.

Dräger Safety AG & Co. KGaA

## Intended Use

### Dräger Polytron® 3000 Transmitter for electrochemical sensors

- For stationary, continuous monitoring of gas concentrations in ambient air, with built-in DrägerSensor®.
- For indoor and outdoor use.
- For installation, as desired, in explosion hazard areas of the zones 0, 1 or 2, corresponding to the device category 1G, 2G, 3 or Class I, Class II, Div. 1 & 2 hazardous area.  
For further details, see the installation notes.
- Calibration by one person even in areas subject to explosion hazards.
- For connection to Dräger central units or to a programmable logic controller (PLC) to warn against physiologically harmful gas concentrations.
- The optional display on the transmitter indicates the actual gas concentration and makes calibration easier.  
False alarms during calibration are avoided by a special maintenance mode with output of a maintenance signal.



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® Polytron is a registered trademark of Dräger.  
DrägerSensor is a registered trademark of Dräger.

## Design

Polytron 3000 is designed for connection to the Dräger Polytron, Regard, QuadGard or Unigard central units.

The Polytron 3000 transmitter may also be connected to other central units if the following conditions are met:

- Industrial standard 4 to 20 mA input signal
- Operating voltage at the transmitter 12 to 30 V DC.

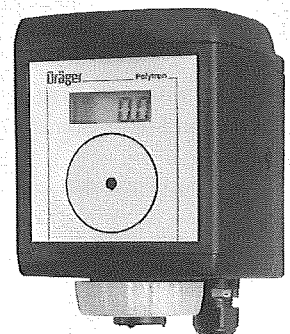
On delivery, Polytron 3000 is configured for the measuring range and gas to be measured. This information can be found on a sticker below the service port and on the back of the measuring unit. The Order No. of the sensor to be used is also specified there.

Two different versions of the Polytron 3000 transmitter are available:

### **Polytron 3000 transmitter with display**

This version is intended for installations requiring local indication of the measured value.

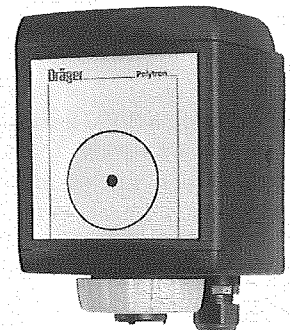
The transmitter is calibrated with the aid of two potentiometers and the display.



### **Polytron 3000 transmitter without display**

This version is intended for installations in which local indication of the measured value is not required.

A digital voltmeter is required for calibration.



## 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 20).
- 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.

#### **In explosion-hazard areas:**

**Observe the national regulations concerning electrical equipment in explosion-hazard areas.**

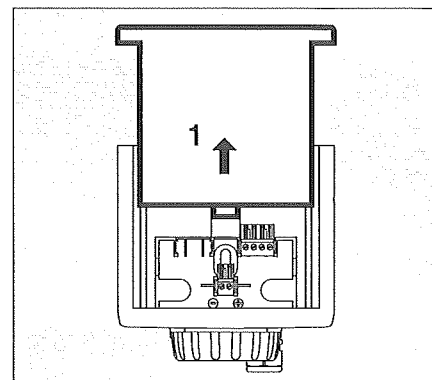
The Dräger Polytron 3000 transmitter consists of two main components:

- Dräger docking station  
This can be pre-installed anywhere and contains the electrical installation components.
- The measuring unit Dräger Polytron 3000  
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).



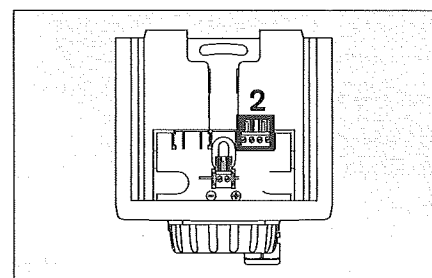
- 2 Remove the 4-pole terminal block (Part No. 83 16 268), keep it in a safe place and insert it again after completion of the installation work.
- Screw the docking station to a wall or structure at the desired position. A drilling template is provided on page 39. The mounting holes are  $66 \pm 4$  mm apart.

### Attention:

**If the wall is not flat, use suitable spacers (such as mounting bracket 68 09 772) to prevent warping of the case.**

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

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

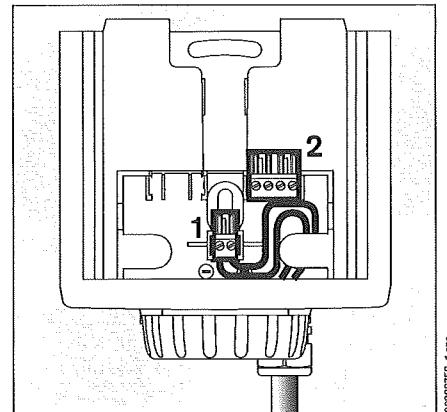


## Electrical connections

- 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.
  
- Connect the transmitter to the control station with a cable with at least two wires conductor cross-section 0.5 (AWG 20) to 2.5 mm<sup>2</sup> (AWG 13).
- For currents of 0 to 22 mA, a DC voltage between 12.0 V DC and 30 V DC must be present at the transmitter.

### Installing the 4 to 20 mA current loop on the transmitter

- Fit 2-wire connecting cable in cable gland, cut to length and strip ends (approx. 80 mm).
- Shorten the shield (if installed) to prevent short-circuiting.
- Connect cable:
  - 1 2-pin terminal for Polytron 3000 – ensure correct polarity. Cut off excess wires or
  - 2 secure in 4-pin terminal.
- 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 3000 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 3000 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 12 V. 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 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:  
 $U_o (V_{oc}) \leq 30 \text{ V}$ ,  $I_o (I_{sc}) \leq 0.3 \text{ A}$ ,  $P_o \leq 700 \text{ mW}$ .
- 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:  $C_i = 0 \text{ nF}$ ,  $L_i = 50 \text{ }\mu\text{H}$ .

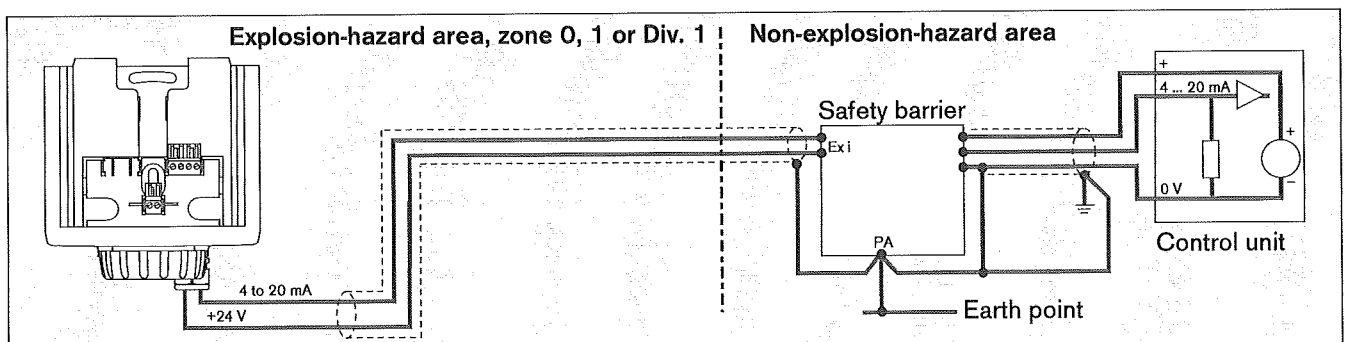
### Transmitter supply units

(without 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 P3S. Selected barriers must be acceptable to the authority having jurisdiction and comply with the assigned P3S entity parameters also taking the cable into account.

Manufacturer	Type	suitable for	Line (Loop)
MTL	MTL 5041	Zone 0, Div. 1	$\leq 190 \text{ }\Omega$
Pepperl & Fuchs	KFD2-STC4-Ex1	Zone 0, Div. 1	$\leq 140 \text{ }\Omega$
	KFD2-STC1-Ex1	Zone 0, Div. 1	$\leq 140 \text{ }\Omega$
Stahl	9160 / 13 - 11 - 11	Zone 0	$\leq 220 \text{ }\Omega$

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



### Installing the transmitters in explosion-hazard areas of zone 2 or in areas not subject to explosion hazards

- Use only supply units of the device category 3.
- 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:  
 $C_i = 0 \text{ nF}$ ,  $L_i = 50 \text{ }\mu\text{H}$ .

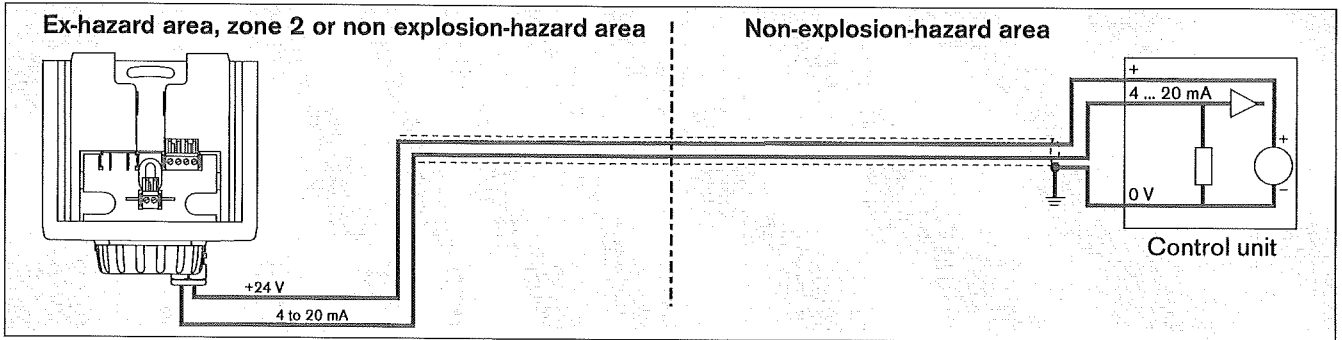
#### Caution:

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 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. Explosion hazard!



### Installing the measuring unit Dräger Polytron 3000

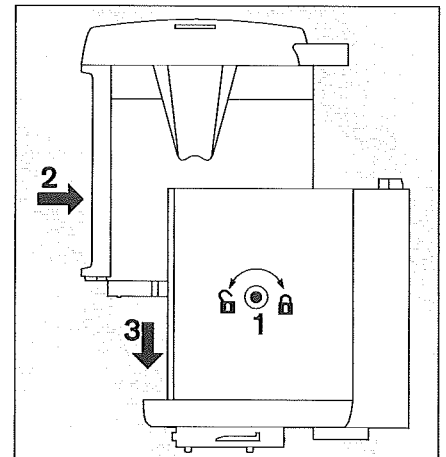
- Remove the rain cover from the previously installed docking station.
- Examine seal for signs of dirt and clean if necessary.

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

**Attention:**

Use only a 5 mm Allan 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 measuring unit Dräger Polytron 3000.



- 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 it 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!

- 1 Turn the eccentric catches clockwise with an allen key to lock the measuring unit (☞ ⇒ ☞ = approx. 180°).

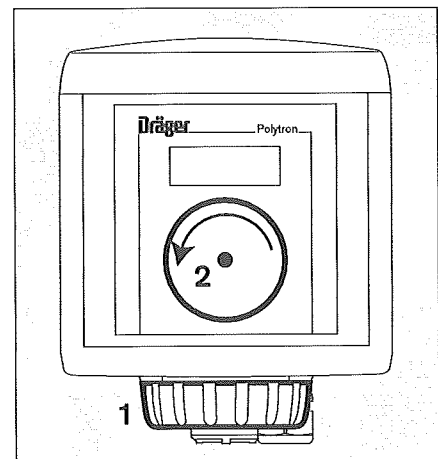
## Fitting the sensor

- 1 Remove bayonet ring from transmitter, remove dummy plate.
- 2 Open front cover of service port with an allen key by turning anticlockwise (approx. 60°).

### Attention:

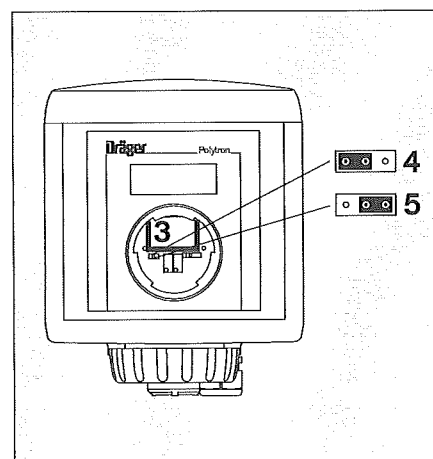
Use only a 5 mm Allan key without a ball head.

- 3 Only use the DrägerSensor specified on the sticker on the Polytron 3000 measuring unit.
  - Remove sensor from its packaging.
  - Remove short-circuit jumper from sensor if installed.
  - 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, otherwise the sensor will be damaged.
  - Secure sensor in transmitter with bayonet ring.



- If the manufacturer's calibration setting for the sensor is to be used:
- Open the front cover of the service port with an allen key by turning anticlockwise (approx. 60°). The maintenance switches and potentiometers for calibration are now revealed.
- 4 Jumper J1 must be set over the two left-hand pins or removed completely.

- If the transmitter is specifically to be calibrated with calibration gas:
- Open the front cover of the service port with an allen key by turning anticlockwise (approx. 60°). The maintenance switches and potentiometers for calibration are now revealed.
- 5 Jumper J1 must be set over the two right-hand pins.



## Start-up

- Switch on power supply.

The transmitter begins its warm-up routine. This is indicated by a flashing display. The warm-up phase takes between 5 minutes and 12 hours, depending on the sensor installed. Note the information in the sensor data sheet. The warm-up phase may take longer in extremely high or low temperatures. It is completed when the display stops flashing.

### When the sensor has warmed up:

- Transmitters set for specific calibration with calibration gas
- Calibrate sensor, page 14.
- Transmitters set for use of the manufacturer's calibration setting for the sensor
- Transmitter is ready for use.
- Check signal transmission to the central unit and alarm output.

### Analog signal

- A current between 4 and 20 mA flows through the transmitter during normal operation. This current is proportional to the gas concentration.
- Polytron 3000 uses various current values to indicate the operating status of the transmitter:

Current	Meaning
4 mA	Zero point
20 mA	Full-scale value
<3.2 mA	Transmitter fault
3.8 mA ... 4 mA	Sensor drift below zero point
20 mA ... 20.5 mA	Full-scale value exceeded
3.4 mA $\pm$ 0.2 mA constant	Maintenance signal

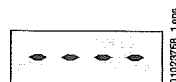
### Display (optional)

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



The following symbols may be displayed during measurement:

- If a fault has been detected:



- If the measuring range has been exceeded:



- If the measuring range is too low (sensor drift below the zero point):



## Maintenance

### Maintenance intervals

#### Before starting operation:

- Check the calibration, see page 14.
- Check the transmission of signals to the control unit and the triggering of alarms.

#### 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.

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 14.  
The interval for regular calibration depends on the sensor being used and on the operating conditions.  
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.

#### As required:

- Replace sensor, page 17.

## Calibrating the unit

### Caution:

- When the transmitter is installed in Ex areas Class II, Div. 1 & 2, Group E, F, G the opening of the housing (required for calibration) must not be done when connected to power (the area has to be de-classified). Explosions hazard!
- Ensure that the sensor is warmed up before it is calibrated. See the sensor data sheet for the warming-up time.
- Only the zero point is checked if an oxygen sensor has been fitted. The zero point of an oxygen sensor does not require calibration.
- The transmitter can be calibrated by the operator on site.
- For critical applications, the calibration intervals such be defined in accordance with the recommendations in EN 50073<sup>1)</sup>, EN45544-4<sup>2)</sup> and national regulations.

### Note the calibration sequence!

- First check the zero point and correct it necessary, Immediately after this, check the sensitivity and adjust it as necessary.
- Never calibrate the sensitivity before calibrating the zero point.
- Zero gas and test gas: see the information in the sensor data sheet.

### 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 Safety Sheets.

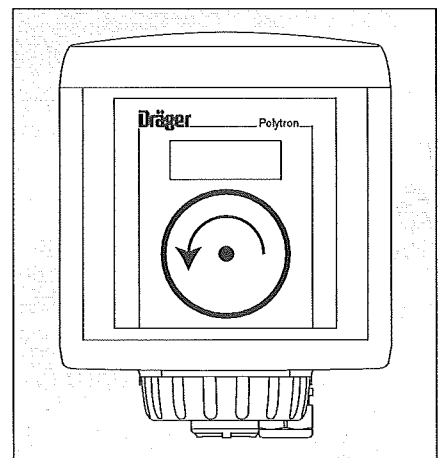
- Open the front cover of the service port with an allen key by turning anticlockwise (approx. 60°). The maintenance switch and potentiometers for calibration are now revealed.

### Attention!

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

### Note:

**Calibration data are not transmitted to the sensor during this calibration process!**

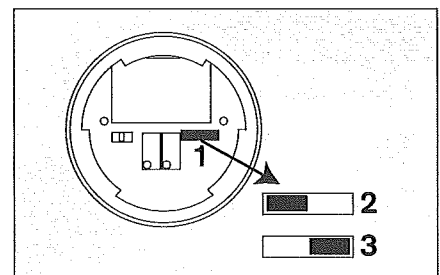


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## Measuring / maintenance mode

- 1 Maintenance switch with two positions.
- 2 Measuring mode position (left-hand position) – measured values are relayed to the analog output.
- 3 Maintenance mode position (right-hand position) – a maintenance signal (3.4 mA ±0.2 mA constant) is relayed to the analog output and prevents alarms being triggered.

- 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.



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**Output for calibration**

- 4 Connect voltmeter (mV setting,  $R_i > 10\text{ M}\Omega$ ) to test points TP1 and TP2 (required for the version without display).

**Caution:**

- For operation in explosion-hazard areas:

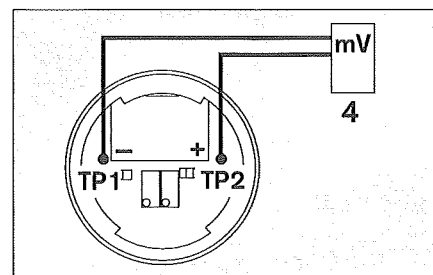
Only use intrinsically safe voltmeters with electrical parameters to the following specifications:

$U_i (V_{\max}) \geq 7.6\text{ V}$ ;  $I_i (I_{\max}) \geq 1\text{ mA}$ ;  $U_o (V_{oc}) \leq 10.4\text{ V}$ ;  $C_i \leq 2.5\text{ }\mu\text{F}$ ;  $L_i \leq 10\text{ mH}$  ( $C_o (C_a)$  and  $L_o (L_a)$  are not relevant as  $C_i$  and  $L_i$  of the test point circuit are zero)

MiniGrabber® Test Clips from Pomona Electronics (order no. 4723 or 4826) shall be used for connecting the voltmeter.

The jumper J1 must always be in place, when connecting the voltmeter.

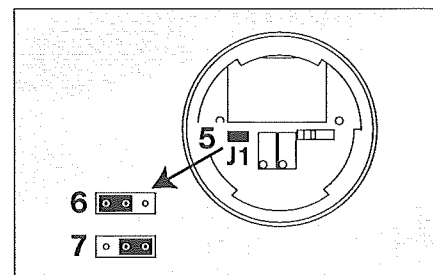
- If a fault is detected, the voltmeter shows  $-200\text{ mV}$ .
- Voltage output  $-200$  to  $1100\text{ mV}$ :
  - $-200\text{ mV}$  corresponds to a fault
  - $-0\text{ mV}$  corresponds to zero concentration
  - $-1000\text{ mV}$  corresponds to the 100 % measuring range end value



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**Jumper**

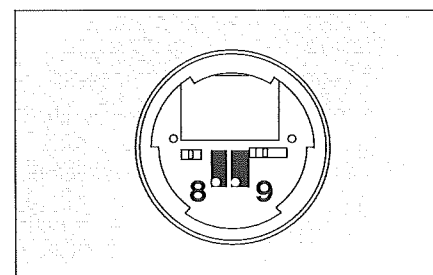
- 5 Jumper J1 can be set to two positions.
- 6 The left-hand position or complete removal of jumper J1 in order to use the manufacturer's calibration setting for the sensor.
- 7 The right-hand position for calibration with calibration gas and the potentiometers for zero point and sensitivity.
- Only the manufacturer's calibration setting for the sensor can be used when jumper J1 is set over the two left-hand pins.
  - Calibration with calibration gas can be performed when jumper J1 has been set over the two right-hand pins.



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**Operating elements**

- 8 Potentiometer (left) for calibration of the zero point.
- 9 Potentiometer (right) for calibration of the sensitivity.



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### Calibrating the zero point

For all sensors except oxygen sensor:

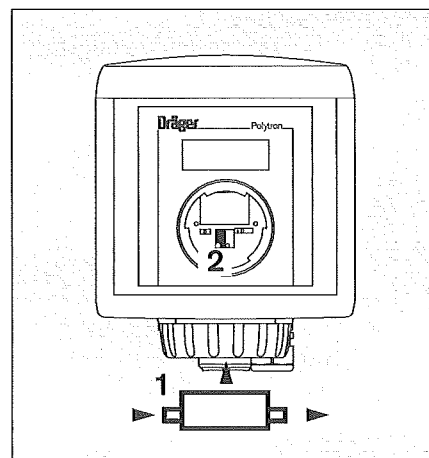
The zero point can be calibrated without the use of nitrogen (zero gas) when the ambient air is free from measuring gas and other interfering gases. Alternatively:

- 1 use the calibration adapter.
- Set maintenance switch to maintenance position, see page 14.
- Let nitrogen flow through the calibration adapter at a rate of approx. 0.5 L/min. Synthetic air may also be used, except when calibrating oxygen sensors.
- Wait for the measured value to stabilize – approx. 3 minutes. Note the information in the sensor data sheet.
- 2 Set potentiometer for zero point so that the display shows 0 and the digital voltmeter 0 mV ±2 mV.

Oxygen sensors:

The zero point cannot be calibrated for these sensors. The zero point is merely checked.

- Switch off calibration gas and remove calibration adapter.
- Set maintenance switch to measuring position, see page 14.



### Calibrating the sensitivity

#### 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.

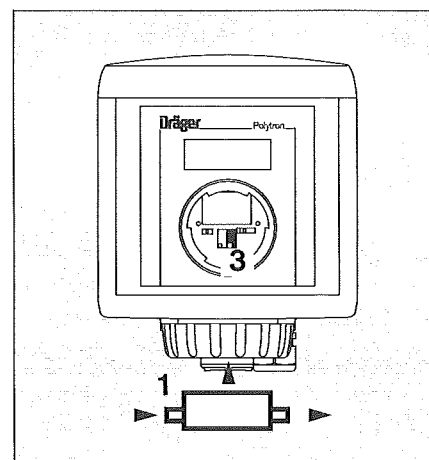
For details, see appropriate Safety Sheets.

- The recommended calibration gas concentration for optimum accuracy is between 40 % and 100 % of the measuring range end value.
  - 1 Use the calibration adapter.
  - Set maintenance switch to maintenance position, see page 14.
  - Let calibration gas flow through the calibration adapter at a rate of approx. 0.5 L/min.
  - Wait for the measured value to stabilize – approx. 3 minutes. Note the information in the safety data sheet.
  - 3 Set the potentiometer for sensitivity so that the display shows the concentration of the calibration gas and the digital voltmeter the calculated voltage in mV.
- Calculation of the voltage  $V_{exp}$  between test points TP1 and TP2:  
 $V_{exp} = \text{Concentration of calibration gas} \div \text{Measuring range} \times 1000 \text{ mV}$

Example: Concentration of calibration gas 250 ppm CO  
 Measuring range 0 to 300 ppm CO

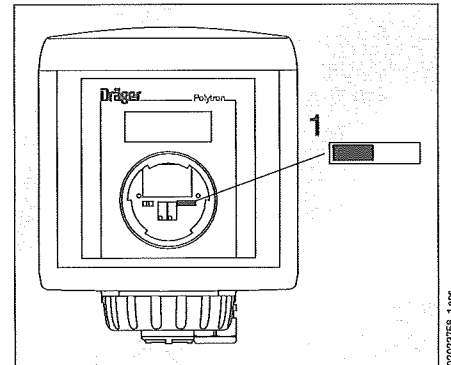
Calculated voltage:  

$$V_{exp} = \frac{250 \text{ ppm}}{300 \text{ ppm}} \times 1000 \text{ mV} = 833 \text{ mV}$$





- Switch off calibration gas and remove calibration adapter.
  - Wait until the measured value drops below the alarm threshold set on the central unit, otherwise an alarm will be triggered when the maintenance switch is returned to the measuring position immediately after calibration.
- 1 Set maintenance switch to measuring position, see page 14.  
The 4 to 20 mA output changes to measuring mode.
  - Refit the front cover of the service port and lock it in place by turning clockwise with an allen key (approx. 60°).



## 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 3000 transmitter.

### Caution:

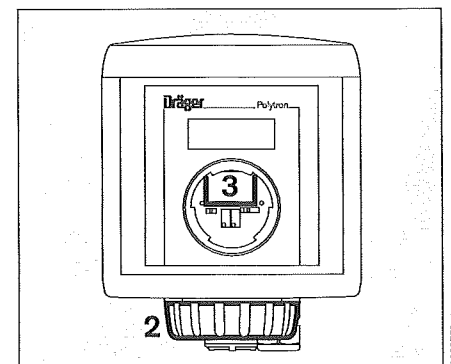
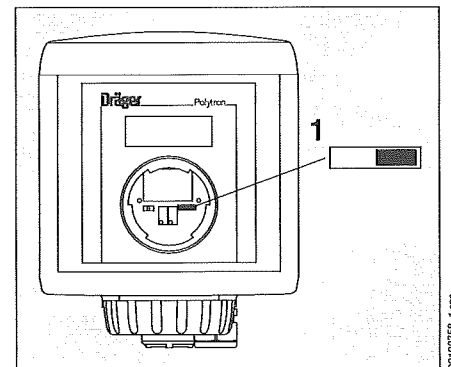
- When the transmitter is installed in Ex areas Class II, Div. 1 & 2, Group E, F, G the opening of the housing (inclusive sensor replacement) must not be done when connected to power (power must be turned off or the area has to be de-classified). Explosion hazard!

- Open the front cover of the service port with an allen key by turning anticlockwise (approx. 60°). The maintenance switch and potentiometers for calibration are now revealed.

### Attention!

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

- 1 Set maintenance switch to right-hand position. The 4 to 20 mA output changes to maintenance mode. In this position, a maintenance signal is relayed to the analog output and prevents alarms being triggered.
- 
- 2 Remove bayonet ring from transmitter; pull out old sensor.
  - 3 Remove sensor from packaging. Ensure that the sensor is of the same type as that specified on the sticker on the measuring unit.
  - Remove short-circuit jumper from sensor if installed.
  - 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, otherwise the sensor will be damaged!
  - 2 Secure sensor in transmitter with bayonet ring.
- 
- Wait until the measured value drops below the alarm threshold set on the central unit, otherwise an alarm will be triggered when the maintenance switch is returned to the measuring position immediately after the sensor replacement.



- 1 Set maintenance switch to left-hand position.  
The 4 to 20 mA output changes to measuring mode.
- Refit the front cover of the service port and lock it in place by turning clockwise with an allen key (approx. 60°).

**When the sensor has warmed up:**

- Transmitters set for specific calibration with calibration gas
- Calibrate sensor, page 14.
- Transmitters set for use of the manufacturer's calibration setting for the sensor.
- Transmitter is ready for use.

**Disposal of electrochemical sensors:**

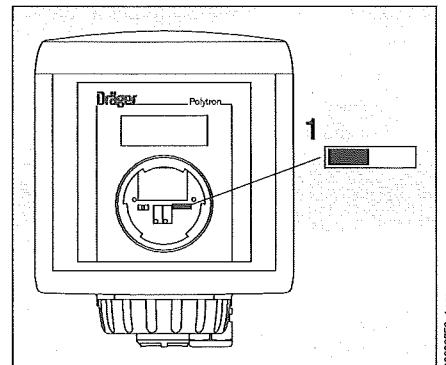
- Sensors must be disposed of as special waste.

**Caution:**



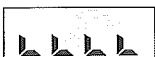
- Do not throw sensors into the fire – explosion hazard.
- Do not open sensors forcibly – risk of caustic burns.

Note the relevant waste disposal regulations.

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








## Fault – Cause – Remedy

Fault	Cause	Remedy
Flashing display	Sensor warms up	Wait for warm-up phase to end.
Display 	Equipment fault, e.g. wrong sensor installed	Only use a sensor with the gas type, Part No. and measuring range indicated on the sticker.
Display 	Measuring range end value exceeded	Wait until the gas concentration is within the measuring range.
Display 	Value too far below zero point	Calibrate zero point if fault occurs frequently.

## 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.

<b>CE markings</b>	<ul style="list-style-type: none"> <li>– Devices and protective systems for use for the intended purpose in explosion-hazard area (Directive 94/9/EG)</li> <li>– Electromagnetic compatibility (Directive 89/336/EEC) max. influence on sensor: <math>\leq 2 \times</math> repeatability</li> </ul>
<b>Ingress protection</b>	IP 66 / IP 67, according to EN 60 529 / IEC 529 (NEMA 4)
<b>Approvals</b>	<b>Polytron 3000 is certified as type P3S.</b>
<b>ATEX</b>	<p>Device markings in accordance with 94/9/EG</p> <p><b>P3S</b></p> <p> 0158  II 1G          EEx ia IIC T4 (<math>-40\text{ °C} \leq T_a \leq +65\text{ °C}</math>)          EEx ia IIC T6 (<math>-40\text{ °C} \leq T_a \leq +40\text{ °C}</math>)</p> <p> 0158  II 3G          EEx nL IIC T4 (<math>-25\text{ °C} \leq T_a \leq +65\text{ °C}</math>)          EEx nL IIC T6 (<math>-25\text{ °C} \leq T_a \leq +40\text{ °C}</math>)</p> <p>BVS 03 ATEX E 406 X          Power Supply: <math>U_i = 30\text{ V}</math>, <math>I_i = 0.3\text{ A}</math>, <math>P_i = 700\text{ mW}</math>, <math>C_i = 0\text{ nF}</math>, <math>L_i = 50\text{ }\mu\text{H}</math>          Meter Circuit, II 1G/3G: <math>U_o = 7.6\text{ V}</math>, <math>I_o = 1\text{ mA}</math>, <math>U_i = 10.4\text{ V}</math>, <math>C_o = 2.5\text{ }\mu\text{F}</math>, <math>L_o = 10\text{ mH}</math>          Year of manufacture (indicated by Serial No.) <sup>1)</sup>          Dräger Safety, 23560 Lübeck, Germany</p> <p>Safety parameters for the supply-voltage and signalling circuit (center terminals of the docking station):  <math>U_i = 30\text{ V}</math>, <math>I_i = 0.3\text{ A}</math>, <math>P_i = 700\text{ mW}</math>, <math>C_i = 0\text{ nF}</math>, <math>L_i = 50\text{ }\mu\text{H}</math></p>
<b>IECEX</b>	<p><b>P3S</b></p> <p><b>EEx ia IIC T4 (<math>-40\text{ °C} \leq T_a \leq +65\text{ °C}</math>)</b>          EEx ia IIC T6 (<math>-40\text{ °C} \leq T_a \leq +40\text{ °C}</math>)          IECEX BVS 04 0003 X          Power Supply: <math>U_i = 30\text{ V}</math>, <math>I_i = 0.3\text{ A}</math>, <math>P_i = 700\text{ mW}</math>, <math>C_i = 0\text{ }\mu\text{F}</math>, <math>L_i = 50\text{ }\mu\text{H}</math>          Baujahr (durch Seriennummer) <sup>1)</sup>          Dräger Safety, 23560 Lübeck, Germany</p>
<b>UL (Underwriters Laboratories Inc.)</b>	<p><b>P3S</b></p> <p>Only as to Intrinsic Safety for use in Hazardous Locations          Class I, Div. 1&amp;2, Groups A, B, C, D          Class II, Div. 1&amp;2, Groups E, F, G          Use in accordance with Dräger Control Drawing SE20105.          T4: <math>-40 \leq T_a \leq +65\text{ °C}</math>, T6: <math>-40 \leq T_a \leq +40\text{ °C}</math>.          Not tested in oxygen enriched atmospheres (<math>&gt;21\text{ % O}_2</math>).          Power Supply: <math>V_{\max} = 30\text{ V}</math>, <math>I_{\max} = 0.3\text{ A}</math>, <math>P_i = 700\text{ mW}</math>,  <math>C_i = 0\text{ nF}</math>, <math>L_i = 50\text{ }\mu\text{H}</math>          Meter circuit: <math>V_{oc} = 7.6\text{ V}</math>, <math>I_{sc} = 1\text{ mA}</math>, <math>V_{\max} = 10.4\text{ V}</math>, <math>C_a = 2.5\text{ }\mu\text{F}</math>, <math>L_a = 10\text{ mH}</math>,  <math>C_i = 0</math>, <math>L_i = 0</math></p> 

<sup>1)</sup> The year of manufacture is indicated by the third letter in the serial number shown on the rating plate: T = 2003, U = 2004, W = 2005, X = 2006, Y = 2007, Z = 2008, A = 2009, B = 2010, C = 2011, etc.  
 Example: Serial No. ARUH-0054: the third letter is U, which means that the unit was manufactured in 2004.

## Signal transmission to central unit

### Analogue

– Measured-value signal	4 mA to 20 mA
– Drift below zero point	3.8 mA to 4 mA
– Measuring range exceeded	20 mA to 20.5 mA
– Unit fault	<3.2 mA
– Maintenance signal	3.4 mA $\pm$ 0.2 mA constant

## Power supply

Supply voltage	12 V DC to 30 V DC Protection against polarity reversal. Terminals for 0.5 to 2.5 mm <sup>2</sup> (20 to 14 AWG).
----------------	---

## Physical specifications

Cable inlet	M20x1.5, for cable diameter 6 to 12 mm
Dimensions (H x W x D)	170 mm x 130 mm x 130 mm
Weight	approx. 0.9 kg / 2.0 lb.

## Ambient conditions

Specifications for the sensor: see sensor data sheet

for operation	–40 to 65 °C (–40 to 160°F) <sup>1)</sup> 700 to 1300 hPa 0 to 100 % relative humidity, no condensation 6 m/s max. air flow
for storage	–40 to 70 °C (–40 to 150°F) 700 to 1300 hPa 0 to 100 % relative humidity, no condensation

<sup>1)</sup> The legibility of the display is restricted at temperatures below –20 °C (–5 °F).

## Order List

Part name and description	Order No.
Dräger Docking Station	<b>83 17 990</b>
Polytron 3000 measuring units and DrägerSensors	Overview, page 23 and page 24
<b>Accessories:</b> Splash guard Transmitter feed unit, U0 = 28 V, I0 = 91 mA Messrs. Stahl, type 9303 / 15 – 22 – 11 Safety barriers are not designed for installation in the explosion-hazard area	<b>68 07 549</b> <b>18 90 212</b>
<b>Calibration accessories:</b> Calibration with ampoules: Calibration flask Test-gas ampoules and calibration gas, see operating instructions for the DrägerSensor being used  Calibration with test gas cylinder: Calibration adapter Calibration adapter V Remote calibration adapter Pressure reducer Test gas cylinder Test gas = Target gas in nitrogen in concentrations between 40 % and 100 % of the measuring range end value  Test gas cylinder 99.9 % N <sub>2</sub> , (zero gas), 4 L, 200 bar	<b>68 03 407</b>      <b>68 06 978</b> <b>68 10 536</b> <b>68 07 955</b> on request Order from gas supplier – note delivery period of 6 – 8 weeks and use-by date on request
<b>Spare parts:</b> Dust filter for DrägerSensor ...  Selective filter for DrägerSensor ...	see sensor data sheet  see sensor data sheet

**Polytron 3000 measuring units**

Part name and description	Order No. with display	Order No. without display	Order No. DrägerSensor
<b>For measuring ammonia (NH<sub>3</sub>):</b>			
Polytron 3000 measuring unit, Measuring range 0 to 100 ppm NH <sub>3</sub> , for DrägerSensor NH <sub>3</sub> LC	83 16 637	83 16 737	68 09 680
Polytron 3000 measuring unit, Measuring range 0 to 300 ppm NH <sub>3</sub> , for DrägerSensor NH <sub>3</sub> HC	83 16 638	83 16 738	68 09 645
Polytron 3000 measuring unit, Measuring range 0 to 1000 ppm NH <sub>3</sub> , for DrägerSensor NH <sub>3</sub> HC	83 16 639	83 16 739	68 09 645
<b>For measuring carbon monoxide (CO):</b>			
Polytron 3000 measuring unit, Measuring range 0 to 100 ppm CO, for DrägerSensor CO	83 16 632	83 16 732	68 09 605
Polytron 3000 measuring unit, Measuring range 0 to 300 ppm CO, for DrägerSensor CO	83 16 631	83 16 731	68 09 605
Polytron 3000 measuring unit, Measuring range 0 to 1000 ppm CO, for DrägerSensor CO	83 16 630	83 16 730	68 09 605
Polytron 3000 measuring unit, Measuring range 0 to 300 ppm CO, for DrägerSensor CO LS	83 16 633	83 16 733	68 09 620
<b>For measuring chlorine (Cl<sub>2</sub>):</b>			
Polytron 3000 measuring unit, Measuring range 0 to 1 ppm Cl <sub>2</sub> , for DrägerSensor Cl <sub>2</sub>	83 16 647	83 16 747	68 09 665
Polytron 3000 measuring unit, Measuring range 0 to 10 ppm Cl <sub>2</sub> , for DrägerSensor Cl <sub>2</sub>	83 16 648	83 16 748	68 09 665
Polytron 3000 measuring unit, Measuring range 0 to 25 ppm Cl <sub>2</sub> , for DrägerSensor Cl <sub>2</sub>	83 16 649	83 16 749	68 09 665
<b>For measuring hydrogen sulphide (H<sub>2</sub>S):</b>			
Polytron 3000 measuring unit, Measuring range 0 to 20 ppm H <sub>2</sub> S, for DrägerSensor H <sub>2</sub> S	83 16 634	83 16 734	68 10 435
Polytron 3000 measuring unit, Measuring range 0 to 50 ppm H <sub>2</sub> S, for DrägerSensor H <sub>2</sub> S	83 16 635	83 16 735	68 10 435
Polytron 3000 measuring unit, Measuring range 0 to 100 ppm H <sub>2</sub> S, for DrägerSensor H <sub>2</sub> S	83 16 636	83 16 736	68 10 435

Part name and description	Order No. with display	Order No. without display	Order No. DrägerSensor
<b>For measuring nitrogen monoxide (NO):</b> Polytron 3000 measuring unit, Measuring range 0 to 50 ppm NO, for DrägerSensor NO LC	83 16 640	83 16 740	68 09 625
<b>For measuring nitrogen dioxide (NO<sub>2</sub>):</b> Polytron 3000 measuring unit, Measuring range 0 to 10 ppm NO <sub>2</sub> , for DrägerSensor NO <sub>2</sub>	83 16 641	83 16 741	68 09 655
<b>For measuring oxygen (O<sub>2</sub>):</b> Polytron 3000 measuring unit, Measuring range 0 to 5 vol.% O <sub>2</sub> , for DrägerSensor O <sub>2</sub>	83 16 642	83 16 742	68 09 720
Polytron 3000 measuring unit, Measuring range 0 to 25 vol.% O <sub>2</sub> , for DrägerSensor O <sub>2</sub>	83 16 643	83 16 743	68 09 720
Polytron 3000 measuring unit, Measuring range 0 to 100 vol.% O <sub>2</sub> , for DrägerSensor O <sub>2</sub>	83 16 644	83 16 744	68 09 720
Polytron 3000 measuring unit, Measuring range 0 to 25 vol.% O <sub>2</sub> , for DrägerSensor O <sub>2</sub> LS	83 16 645	83 16 745	68 09 630
<b>For measuring sulphur dioxide (SO<sub>2</sub>):</b> Polytron 3000 measuring unit, Measuring range 0 to 10 ppm SO <sub>2</sub> , for DrägerSensor SO <sub>2</sub>	83 16 646	83 16 746	68 09 660
<b>For measuring other gases:</b> Polytron 3000 measuring unit, Measuring range and DrägerSensor	On request	On request	On request



## ATEX approval



## Translation

**EC-Type Examination Certificate**

- (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

Signed: Eickhoff

Certification body

Special services unit

Page 1 of 3 to BVS 03 ATEX E 406 X  
This certificate may only be reproduced in its entirety and without change  
Dinnendahlstrasse 9 44809 Bochum Germany Phone +49 201 172-3947 Fax +49 201 172-3948  
(until 31.05.2003: Deutsche Montan Technologie GmbH Am Technologiepark 1 45307 Essen)



(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  $< 10^9 \Omega$ ). 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	$\mu$ H

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	$\mu$ F
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	

Page 2 of 3 to BVS 03 ATEX E 406 X

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## 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	$\mu$ H

## 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


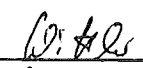

**EXAM BBG Prüf- und Zertifizier GmbH**


  
Certification body


  
Special services unit

Page 3 of 3 to BVS 03 ATEX E 406 X  
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(until 31.05.2003: Deutsche Montan Technologie GmbH Am Technologiepark 1 45307 Essen)

## IECEx approval

		<b>IECEx Certificate of Conformity</b>	
<b>INTERNATIONAL ELECTROTECHNICAL COMMISSION</b> <b>IEC Certification Scheme for Explosive Atmospheres</b> <small>for rules and details of the IECEx Scheme visit <a href="http://www.iecex.com">www.iecex.com</a></small>			
Certificate No.:	IECEx BVS 04.0003X	Issue No.:	0
Status:	Current		
Date of Issue:	2004-01-20	Page 1 of 4	
Applicant:	Dräger Safety AG & Co. KGaA Revalstrasse 1 23560 Lübeck Germany		
Electrical Apparatus:	Gas measuring transmitter type P3S and type P3U		
Optional accessory:	see Schedule		
Type of Protection:	General Requirements, Intrinsic Safety		
Marking:	Ex ia IIC T6 Tamb - 40 °C up to + 40 °C Ex ia IIC T4 Tamb - 40 °C up to + 65 °C		
Approved for issue on behalf of the IECEx Certification Body:	Dr. Michael Wittler		
Position:	Head of Testing Laboratory		
Signature: (for printed version)			
Date:	20.01.04		
<small>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.</small>			
Certificate issued by:			
<b>EXAM BBG Prüf- und Zertifizier GmbH</b>			
Fachstelle für Sicherheit elektrischer Betriebsmittel – BVS Dinnendahlstrasse 9 44809 Bochum Germany			
 BBG Prüf- und Zertifizier GmbH			

		<b>IECEx Certificate of Conformity</b>	
Certificate No.:	IECEx BVS 04.0003X		
Date of Issue:	2004-01-20	Issue No.:	0
		Page	2 of 4
Manufacturer:	Dräger Safety AG & Co. KGaA Revalstrasse 1 23560 LÜbeck Germany		
Manufacturing location(s):			
<p>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.</p>			
<b>STANDARDS:</b> 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 : 2000 Edition: 3.1		Electrical apparatus for explosive gas atmospheres - Part 0: General requirements	
IEC 60079-11 : 1999 Edition: 4		Electrical apparatus for explosive gas atmospheres - Part 11: Intrinsic safety 'i'	
<p><i>This Certificate does not indicate compliance with electrical safety and performance requirements other than those expressly included in the Standards listed above.</i></p>			
<b>TEST &amp; ASSESSMENT REPORTS:</b> A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in			
IECEx ATR: DE/BVS/04/2009		File Reference: A 20030561	

		<h2 style="text-align: center;">IECEx Certificate of Conformity</h2>	
Certificate No.:		IECEx BVS 04.0003X	
Date of Issue:		2004-01-20	Issue No.: 0
		Page 3 of 4	
<h3>Schedule</h3>			
<b>EQUIPMENT:</b> <i>Equipment and systems covered by this certificate are as follows:</i>			
<p><b>Description</b></p> <p>The Gas Detectors 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 &lt; 1 GΩ). 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.</p> <p><b>P3S:</b></p> <p>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.</p> <p><b>P3U:</b></p> <p>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 <b>P3U Remote Adapter</b> may be plugged in, instead of the electro-chemical sensor. The cable of the P3U Remote Adapter, which may be up to 100 m in length, connects to the <b>P3U Remote Sensor</b> which now accepts the electrochemical sensor.</p>			
<p><b>Marking</b></p> <p>1 For the gas measuring transmitter P3:</p> <p style="margin-left: 20px;">The name of the manufacturer or his trademark  Type P3S or P3U  Ex ia IIC T4 (Tamb -40 °C up to +65 °C)  Ex ia IIC T6 (Tamb -40 °C up to +40 °C)  Serial number  Certificate number</p> <p>2 For the remote adapter:</p> <p style="margin-left: 20px;">The name of the manufacturer or his trademark  Type P3U Remote Adapter  Ex ia IIC T4 (Tamb -40 °C up to +65 °C)  Ex ia IIC T6 (Tamb -40 °C up to +40 °C)  Serial number  Certificate number</p> <p>3 For the remote sensor:</p> <p style="margin-left: 20px;">The name of the manufacturer or his trademark  Type P3U Remote Sensor  Ex ia IIC T4 (Tamb -40 °C up to +65 °C)  Ex ia IIC T6 (Tamb -40 °C up to +40 °C)  Serial number  Certificate number</p>			
<p><b>CONDITIONS OF CERTIFICATION: YES as shown below:</b></p>			
<p>The measurement function for explosion protection is not the subject of this IECEx ASSESSMENT AND TEST REPORT.</p>			



## IECEX Certificate of Conformity

Certificate No.: IECEx BVS 04.0003X

Date of Issue: 2004-01-20

Issue No.: 0

Page 4 of 4

### EQUIPMENT(continued):

#### Parameters

- 1 Gas measuring transmitter type P3S
  - 1.1 Supply-/signal circuit  
Connection via terminals X1/1 and X1/2
 

Voltage	U <sub>i</sub>	DC	30	V
Current	I <sub>i</sub>		300	mA
Power	P <sub>i</sub>		700	mW
maximum internal capacitance	C <sub>i</sub>		negligible	
maximum internal inductance	L <sub>i</sub>		50	μH
  - 1.2 Measuring circuit, for calibration only  
Connection via 2 contact areas
 

Voltage	U <sub>o</sub>	DC	7.6	V
Current	I <sub>o</sub>		1	mA
maximum external capacitance	C <sub>o</sub>		2.5	μF
maximum external inductance	L <sub>o</sub>		10	mH
Voltage	U <sub>i</sub>	DC	10.4	V
maximum internal capacitance	C <sub>i</sub>		negligible	
maximum internal inductance	L <sub>i</sub>		negligible	
- 2 Gas measuring transmitter type P3U  
Supply-/signal circuit  
Connection via terminals X7/1 - X7/4 or X8/1 - X8/4 (looped through)
 

Voltage	U <sub>i</sub>	DC	30	V
Current	I <sub>i</sub>		300	mA
Power	P <sub>i</sub>		700	mW
maximum internal capacitance	C <sub>i</sub>		5	nF
maximum internal inductance	L <sub>i</sub>		50	μH
- 3 Ambient temperature range T<sub>amb</sub>

Ex ia IIC T6	-40 °C up to +40 °C
Ex ia IIC T4	-40 °C up to +65 °C

Annexe:

## UL approval



**Underwriters  
Laboratories Inc.®**

**Northbrook Division**

333 Pfingsten Road  
Northbrook, IL 60062-2098 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,

Reviewed by:

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](mailto:Frederic.J.Cleary@us.ul.com)

Benjamin P. Schaefer  
Staff Engineer  
Hazardous Locations, Gas & Oil  
Conformity Assessment Services  
E-mail: [benjamin.schaefer@us.ul.com](mailto:benjamin.schaefer@us.ul.com)

An independent organization working for a safer world with integrity, precision and knowledge.









## Declaration of Conformity



### Konformitätserklärung Declaration of Conformity

Wir / We      Dräger Safety AG & Co. KGaA  
Revalstraße 1  
D-23560 Lübeck  
Deutschland / Germany

erklären, dass das Produkt / declare that the product

**Gasmessgerät Typ P3S / P3U**  
**Gas Detection Instrument type P3S / P3U**

gemäß den Bestimmungen der Richtlinie 94/9/EG (Geräte und Schutzsysteme zur bestimmungsgemäßen Verwendung in explosionsgefährdeten Bereichen) übereinstimmt mit dem Baumuster der EG-Baumusterprüfbescheinigung

following the provisions of Directive 94/9/EC (Equipment and protective systems intended for use in potentially explosive atmospheres) is in conformity with the type of the EC-type-examination certificate

**BVS 03 ATEX E 406 X**

für / for      Gerätegruppe und -kategorie / Equipment Group and Category: **II 1G, II 3G**  
Zündschutzart / Type of Protection: **ia, nL**  
Explosionsgruppe / Explosion Group: **IIC**  
Temperaturklasse / Temperature Class: **T4 / T6**

ausgestellt von der benannten Stelle / issued by the notified body

**EXAM – BBG Prüf- und Zertifizier GmbH**  
**Dinnendahlstraße 9**  
**D-44809 Bochum**  
**Kennnummer / identification number 0158.**

Das Produkt wurde unter einem Qualitätssicherungssystem hergestellt, endabgenommen und geprüft, das zugelassen wurde von der benannten Stelle

The product has been manufactured, finally inspected and tested under a quality system which has been approved by the notified body

**DMT - Gesellschaft für Forschung und Prüfung mbH**  
**Zertifizierungsstelle**  
**Am Technologiepark 1**  
**D-45307 Essen**  
**Kennnummer / identification number 0158.**

Ralf Drews  
Gasesstechnologie Entwicklung  
Dräger Safety AG & Co. KGaA

A handwritten signature in black ink, appearing to read "Ralf Drews".

Dokument-Nr. / document no.: **SE20148 "00"**  
Seite 1 von 1 / page 1 of 1

Lübeck, 20.01.2004

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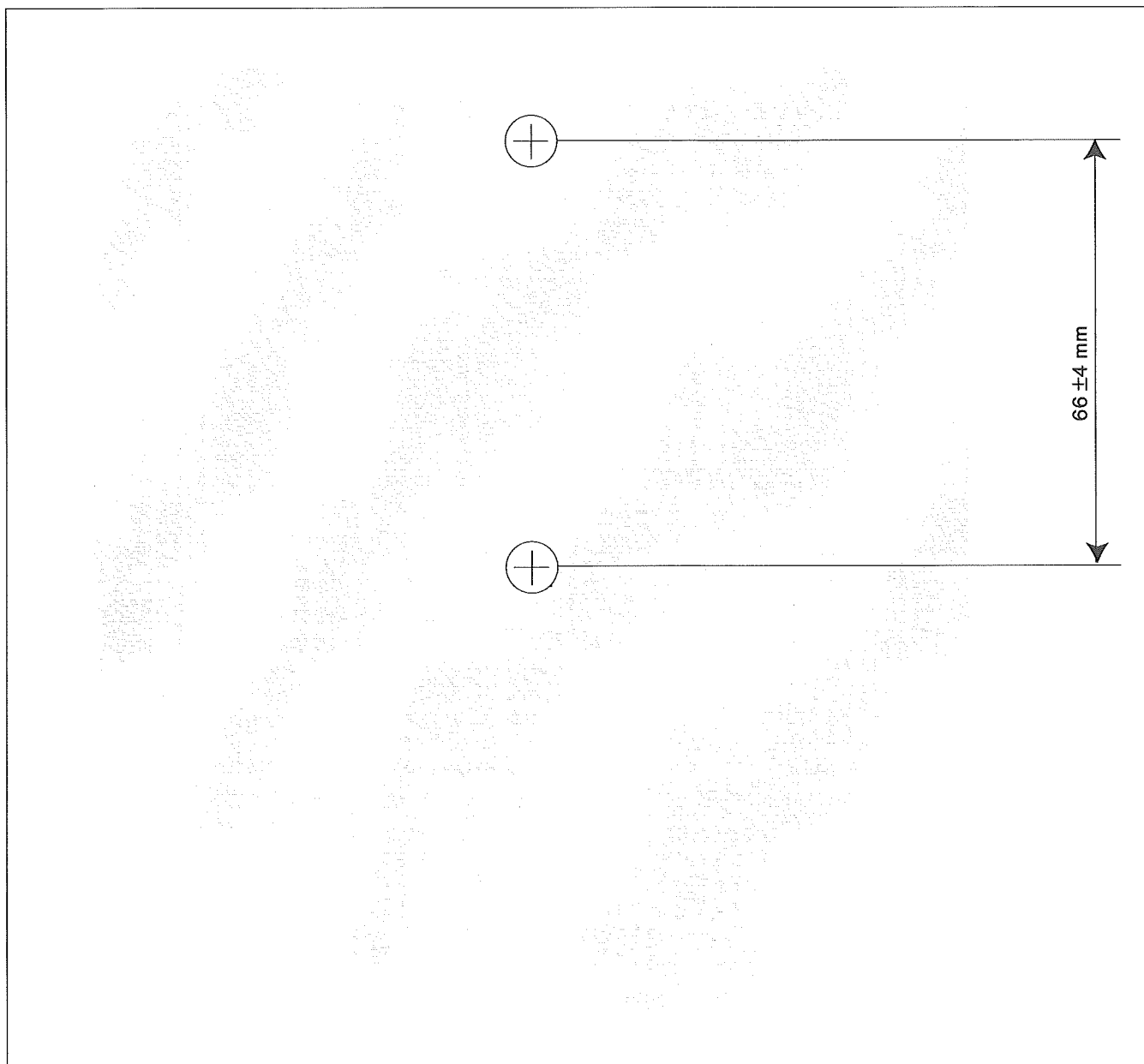
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## Drilling templates

### Dräger docking station



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**Dräger Safety AG & Co. KGaA**

Revalstraße 1  
D-23560 Lübeck  
Germany  
Tel. +49 451 8 82 - 27 94  
Fax +49 451 8 82 - 49 91  
www.draeger-safety.com

**Draeger Industrie S.A.**

3c, Route de la Fédération  
F-67025 Strasbourg Cedex  
France  
Tel. +33 388 40 76 76  
Fax +33 388 40 76 67

**Draeger Safety UK Limited**

Kitty Brewster Estate  
Blyth  
Northumberland NE24 4RG  
United Kingdom  
Tel. +44 1670 352 891  
Fax +44 1670 356 266

**Draeger Safety, Inc.**

505 Julie Rivers  
Suite 150  
Sugar Land, TX 77478  
USA.  
Tel. +1 281 498 1082  
Fax +1 281 498 5190

**Draeger Safety Asia Pte.Ltd**

67, Ayer Rajah Crescent #06-03  
SGP - 139950 Singapore  
Singapore  
Tel. +65 6872 92 88  
Fax +65 6773 20 33

**Beijing Fortune Draeger Safety  
Equipment Co., Ltd.**

Jixiang Lu.B Area  
Beijing  
Tianzhu Airport Industrial Zone  
Houshayu  
Shunyi County  
Beijing, 101300  
P.R. China  
Tel. +86 10 80498000  
Fax +86 10 80498005

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