Polytron 2

Transmitter for electrochemical Sensors

Instructions for Use

90 23 444 – 5th edition – September 2003

Contents

For Your Safety

Strictly follow the Instructions for Use

Any use of the transmitter requires full understanding and strict observation of these instructions.
The transmitter is only to be used for purposes specified here.

Maintenance

The transmitter must be inspected and serviced regularly by trained service personnel at six monthly intervals (and a record kept).
Repair of the transmitter 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 or components which have been tested and approved according to the national or European regulations on electrical equipment in rooms subject to explosion hazards, may be used only under the conditions specified in the approval.
Modifications of components or the use of faulty or incomplete parts are not permitted.
In the case of repairs to equipment or components of this type, the national regulations must be observed.

Liability for proper function or damage

The liability for the proper function of the transmitter is irrevocably transferred to the owner or operator to the extent that the transmitter is serviced or repaired by personnel not employed or authorized by DrägerService or if the transmitter 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

Polytron® 2 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.
- 4 mA to 20 mA interface compatible with HART® to connect to suitable control units.

In conjunction with a controller (e. g. Regard):

- Warning before any hazardous gas concentrations are reached.
- Automatic implementation of counter measures (for example, additional ventilation).
- Indication of transmitter faults; display of maintenance measures required.
- Special calibration mode (blocking of alarm triggering, display of calibration mode, one-man calibration).

Polytron 2 is suitable for use in Zone 1 and Zone 2 explosion-hazard areas (classification II 2G) and in Zone 22 (classification II 3D).

Notes for use in Zone 22:
Valid only for the version Polytron 2 with display (Order-No. 8314400, 8316980 see II 3D-marking on the type plate).

Safety relevant data concerning dust explosion-protection:

Equipment group and category:	
(acc. to Directive 94/9/EC)	II 3D
Maximum surface temperature:	65 °C
Degree of protection:	IP 54
Maximum supply voltage	30 VDC
Ambient temperature:	–40 °C to 65 °C

The transmitter Polytron 2 is a device of equipment group and category **II 3D** acc. to the directive 94/9/EC and can be installed in zone 22 without safety barriers as long as the following conditions concerning safe use are met:

1. The device category II 3D is only valid for transmitters Polytron 2 with display which are marked accordingly.
2. The transmitter has to be kept closed to ensure the degree of proctection IP 54.
3. The transmitter Polytron 2 has a maximum surface temperature of 65 °C and a degree of protection IP 54. It has to be installed and maintened according to the national rules and regulations (e.g. in European countries acc. to EN 50281-1-1-2).
4. The transmitter may only be opened if the voltage is switched off or if installed in the non-hazardous area. This is especially true for the sensor replacement procedure!

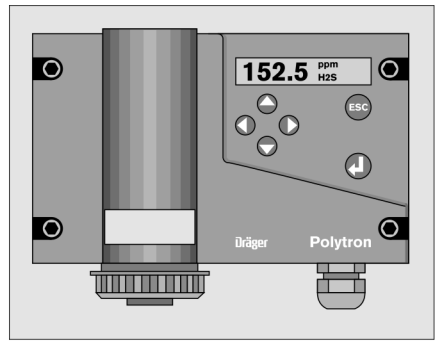
® Polytron is a registered trademark of Dräger.
® DrägerSensor is a trademark registered in Germany by Dräger.
® HART is a registered trademark of HCF, Austin, Texas, USA

Design

Several different assemblies are possible because of the modular design.

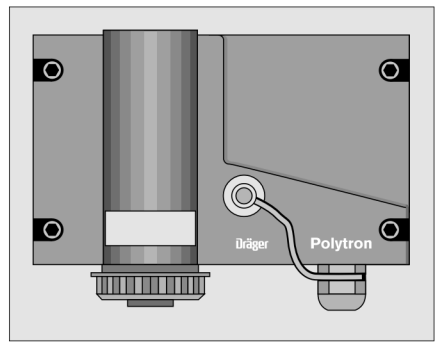
Transmitter with display and operator keypad and option of connecting additional hand-held, HART-compatible device or a HART-compatible operating station.

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.



Transmitter without display and with operator keypad which is operated via the Polytron 2 hand-held terminal HHT (order no. 83 13 602) or a hand-held, HART-compatible device connected by a 2-wire cable at any point or a HART-compatible operating station.

This version is suitable for installations where access is not easy for the operator or where no display is required.



Installation of the Transmitter

Select installation point according to local regulations.

– The transmitter should be mounted at a location with little vibration and stable temperature.

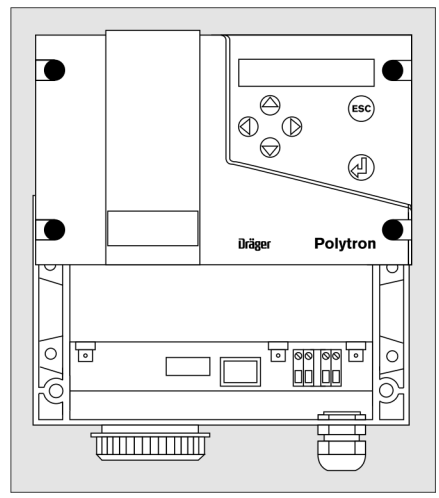
– Keep transmitter away from flooding water, oil etc., as well as any chance of mechanical damage.

– The transmitter should be located in an area where a gas leak is most likely to occur.

– Take the gas density into account.
For gases less dense than air the transmitter should be mounted above any possible leakage point, or at the highest point at which large concentrations of gases might be found.
For gases and vapours more dense than air, the transmitter should be mounted below any possible leakage point or at the lowest point at which these gases and vapours might be found.

– The transmitter shall be mounted vertically (sensor pointing downwards).

– For maintenance purposes, leave at least 30 cm (12 ") of space below the transmitter.

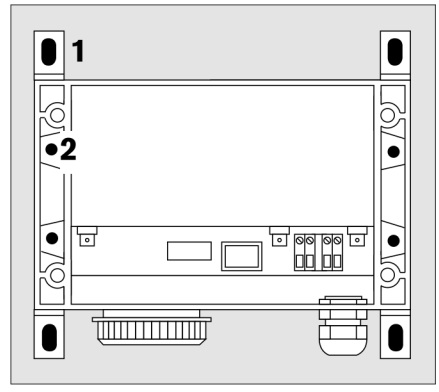


Installation in areas subject to explosion hazard:

– Observe national regulations on electrical installations in areas subject to explosion hazard.

Removing cover:

- Remove four screws,
carefully lift off cover and fix cover to the upper holes.
- If necessary:
Disconnect the display / keypad.



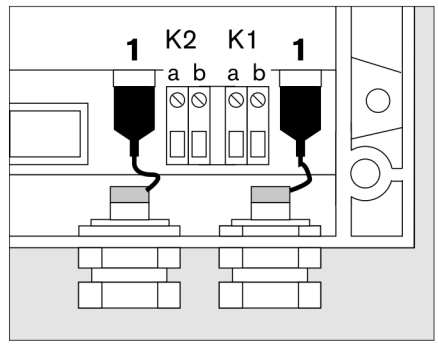
1 Drag out brackets on transmitter and mount transmitter with four screws through the brackets – or

2 remove brackets and mount transmitter with four screws through the housing.

Installation of Electrical Connections

- Remove cover from transmitter.

– Only trained personnel may route and connect the electrical installation, whilst observing appropriate regulations –
use at least 2-core, shielded cable (e.g. LiYCY).



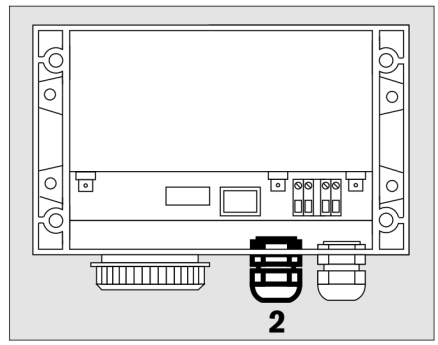
1 Connect the cable shielding to the inner metal housing of the transmitter by using a 6.3 mm (0.25 ") flat connector.
Make connection as short as possible.

- When connecting the wires to the terminals K1a / K1b or K2a / K2b, the polarity does not matter.

For Multidrop installation only
(see pages 11 to 13)

- Knock out prepared breakthrough point for second cable gland.

2 Screw second cable gland (commercial cable gland Pg 13.5 or M 20) into housing and secure with nut.



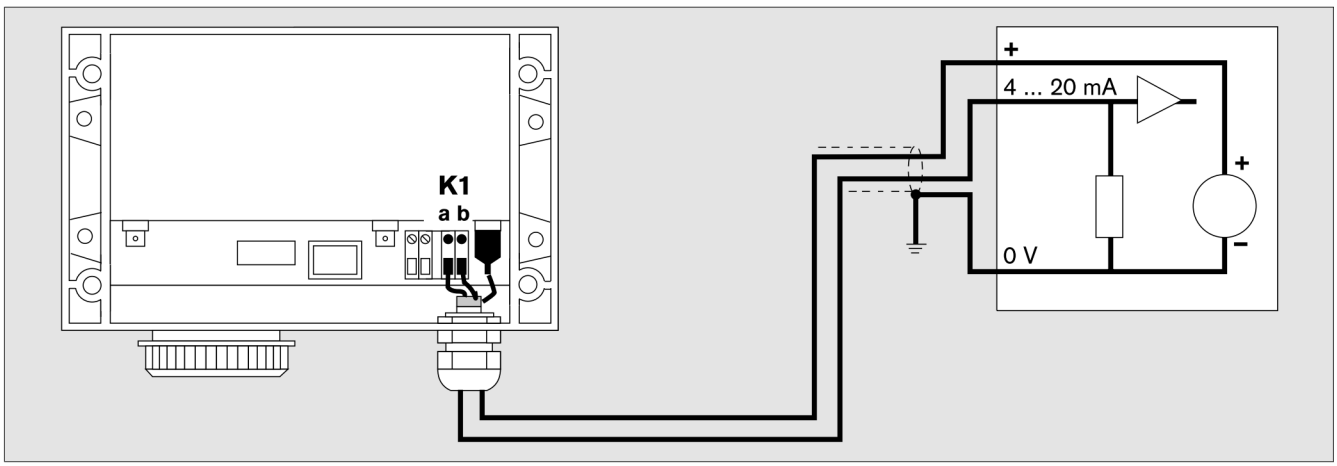
Connecting the Transmitter to Dräger Controllers (e. g. Regard)

Please refer to the instructions for use of the appropriate controller.

Connecting the Transmitter to other Controllers (4 to 20 mA current loop)

In Non-Ex area:

- Connect shielding and negative supply to the body of the control panel or to switchboard.
- When operating with other control units, care must be taken that the voltages on the transmitter do not fall below the following values when supply voltage, load resistance 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.
- When HART digital communication is to be used, the load resistance of the supply unit must be in the 230 to 1100 Ω range.
- When connecting the wires to the terminals a and b, the polarity does not matter.



In Ex-area:

- An approved safety barrier must be installed between transmitter and controller. The permissible values of the supply circuit must not be exceeded.
- Use safety barriers with the following specification only:
  $U_{max} \leq 30$ V, $I_{max} \leq 0.3$ A, $P_{max} \leq 700$ mW
  (for use with HART hand-held terminal: lower values may apply. Check with certified parameters of hand-held terminal), for example:

Transmitter supply units
(without HART-communication between Ex / Non-Ex area)

Manufacturer	Type	R_{Cable} (Loop)
MTL	MTL 5041	≤ 350 Ω
Pepperl & Fuchs	KFD2–CR–Ex1.30 200	≤ 400 Ω

SMART transmitter supply units
(with HART-communication between Ex / Non-Ex area)

Manufacturer	Type	R_{Cable} (Loop)
Endress + Hauser	RN 221 N–B1 (ATEX) RN 221 N–C1 (FM) RN 221 N–D1 (CSA) RN 221 N–E1 (TIIS)	≤ 380 Ω
MTL	MTL 5042	≤ 400 Ω
Pepperl & Fuchs	KFD2–STC4–Ex1	≤ 300 Ω
Stahl	9160/13–11–11	≤ 400 Ω

The cable resistances given apply for a load resistance of 250 Ω. For other load resistances the permissible cable resistance may be drastically reduced.

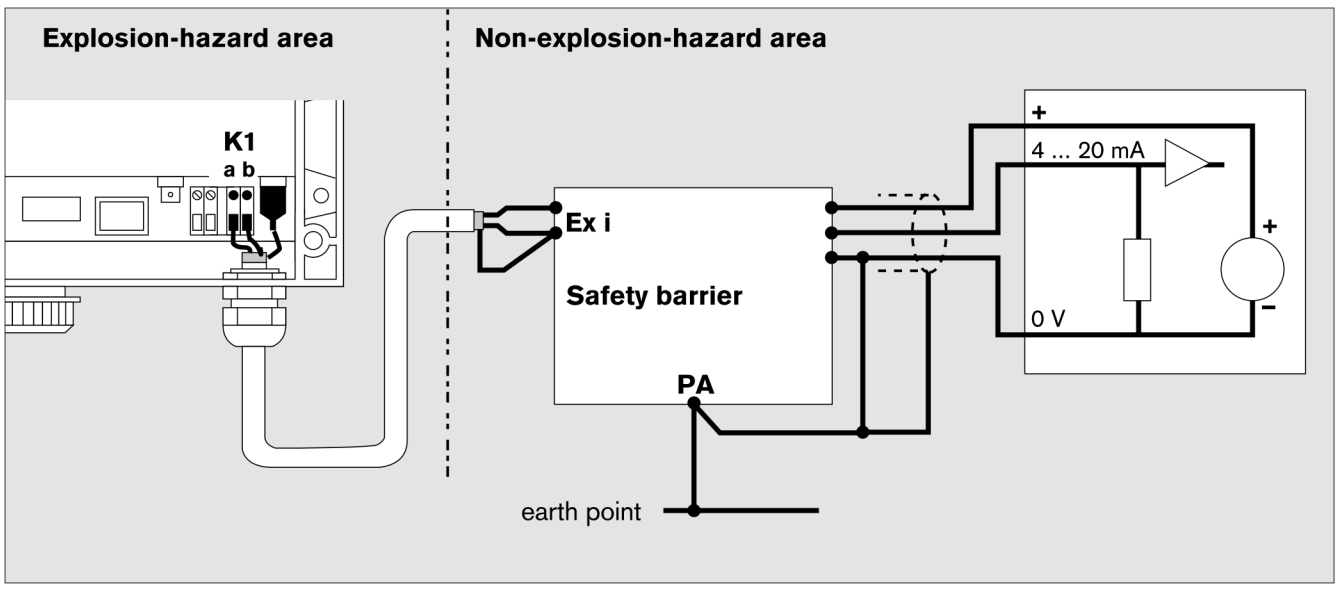
- When other barriers have been selected, care must be taken that the voltages on the transmitter do not fall below the following values when barrier parameters and cable resistance are taken into account:
  16.5 V for a current of 3 mA and 8.0 V for a current of 22 mA

For earthed barriers:

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

For non-earthed (potential free) barriers:

- Connect shielding to negative Ex-i connector.



- When connect the wires to the terminals a and b, the polarity does not matter.

Connecting several Transmitters to HART-Multidrop Controller

- All transmitter must be set-up individually. Transmitters on the same multi-drop-line must be configured to a different "polling address", between "1" and "15" (see page 40 »CONFIGURATION: COMMUNICATION: POLLING ADDRESS«).
  It is advisable to use numbers in consecutive order, starting with "1".

In Non-Ex area:

- Up to a maximum of 8 transmitters can be connected to one 2-wire cable. The cable may be looped through the second cable gland.
- When connecting the wires to the terminals a and b, the polarity does not matter.

The permissible loop resistance of the cable is calculated according to the following formula:

$$R_{Cable} = \frac{U - 16{,}5}{n \times 0.003}\ \Omega$$

n = actual number of transmitters per cable

U = output voltage in V of the supply unit at an output current of n x 3 mA

In Ex-area:

- Depending on the supply unit, up to a maximum of 7 transmitters can be connected to one 2-wire cable.
  The cable may be looped through the second cable gland.
- Fit safety barrier with explosion-protection certificate between controller and transmitter.
  The permissible cable parameters (L_{max}, C_{max}) must not be exceeded.

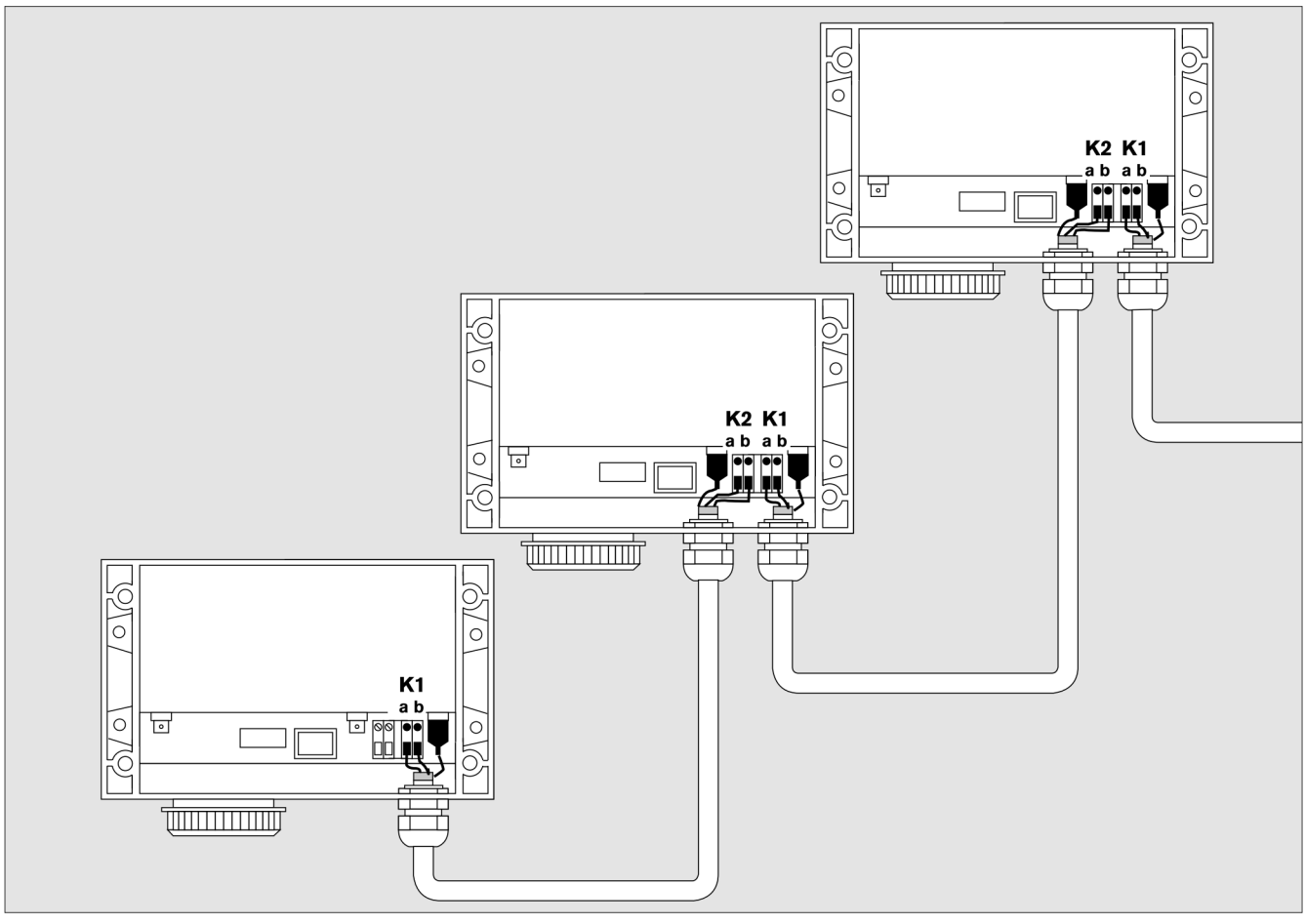
  The safety barrier must be capable of transmitting communication signals from the Ex-area to the Non-Ex area and vice versa.
  Special SMART-transmitter supply units are available for this purpose from several manufacturers.
- When connecting the wires to the terminals a and b, the polarity does not matter.

- Use safety barriers with the following specification only:
  $U_{max} \leq 30$ V, $I_{max} \leq 0.3$ A, $P_{max} \leq 700$ mW
  (for use with HART hand-held terminal:lower values may apply. Check with certified parameters of hand-held terminal), for example:

SMART transmitter supply units
(with HART-communication between Ex / Non-Ex area)

Manufacturer	Type	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) RN 221 N–C1 (FM) RN 221 N–D1 (CSA) RN 221 N–E1 (TIIS)	≤ 120 Ω	≤ 50 Ω	– – –
MTL	MTL 5042	≤ 33 Ω	≤ 27 Ω	≤ 20 Ω
Pepperl & Fuchs	KFD2–STC4–Ex1	≤ 90 Ω	≤ 10 Ω	– – –
Stahl	9160/13–11–11	≤ 160 Ω	≤ 80 Ω	≤ 20 Ω

The cable resistances given apply for the maximum possible number of transmitters as well as a load resistance of 250 Ω. For other load resistances the permissible cable resistance may be drastically reduced.



If less than the maximum possible number of transmitters are installed, the permissible cable resistance is increased and can be calculated according to the formula below.

When selecting other barriers care must be taken that the output voltage for an output current of n x 3 mA is above 16.5 V DC.
The permissible loop resistance of the cable is calculated according to the following formula:

$$R_{Cable} = \frac{U - 16.5}{n \times 0.003} \ \Omega$$

n = actual number of transmitters per supply unit
U = output voltage in V of the supply unit at an output current of n x 3 mA

For earthed barriers:

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

For non-earthing (potential free) barriers:

- Connect shielding to negative Ex-i (I. S.) connector.

After connecting electrical installation:

- Screw cover back on, fix with four screws –
  ensure that gasket is fitted correctly and dirt-free –
  take care not to trap cable.
- Prior to fitting the sensors to the transmitters, all transmitters on the same multidrop-line must be configured to a different "polling address", between "1" and "15" (see page 40 »CONFIGURATION: COMMUNICATION: POLLING ADDRESS«).
  It is advisable to use numbers in consecutive order, starting with "1"

Fitting Sensor to Transmitter

- Use only DrägerSensors which are designed for use with the Polytron 2 transmitter.
- When the sensor is fitted the electronics of the transmitter automatically adjusts to the operating parameters of the sensor.

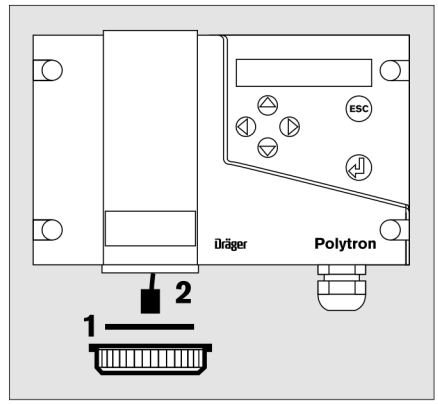
  A sensor which has been calibrated within the calibration interval need not be re-calibrated after assembly.

  When the calibration interval has expired, a new warning message is given, see page 26.

– If the sensor used before is identical to the new one (identical part no.), the transmitter will completely keep its configuration. Otherwise the transmitter will be configured with the default values (see Sensor Data Sheet).
Also see chapter "Sensor Lock", page 38.

1 Remove bayonet ring from transmitter; remove cover plate.

2 Pull out cable with connector.



- Take sensor out of packaging.
Make sure that the sensor is Polytron 2 compatible.

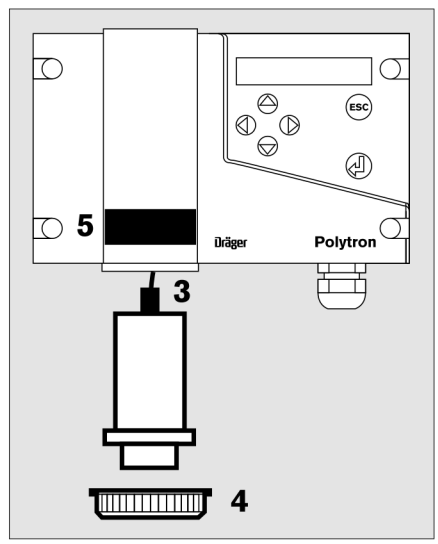
- If fitted: remove short-circuit bridge from sensor plug.

3 Fit connector to sensor and insert cable and sensor into transmitter.

4 Secure sensor in transmitter with bayonet ring.

5 Mark transmitter with 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 or a Polytron 2 Non Display transmitter is used.

- Check sensor function.



Start-up

- Switch on power supply.
- Allow transmitter to warm up, until message »Sensor ready after ... minutes« disappears or the output interface gives no further maintenance signal – depending on sensor installed this time can be between 5 minutes and 12 hours, see sensor data sheet.

  During warm-up phase 2 (indicated by an »**i**« in the upper right hand corner of the display), following the count-down, the sensor is ready for operation (see sensor data sheet). During this phase a warning signal is given, if activated, see page 39.
  As soon as the sensor has reached the measurement accuracy specified, the warning signal is no longer given.

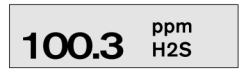
  At extremely high or low temperatures, full accuracy of measurement may be achieved after some extra time.
  Thereafter the sensor will behave as during measurement.
- Check calibration; calibrate when necessary – see pages 28 to 30.
- Check signal transmission to control unit, and alarm triggering – see pages 31 to 32.

Measurement

– According to gas concentration, a current of between 4 and 20 mA flows through the transmitter during analog signal transmission.

Current	Meaning
4 mA	Zero point
20 mA	Measuring range end value
< 3.2 mA	Fault
3.8 mA ... 4 mA	Underflow
20 mA ... 20.5 mA	Overflow
> 23 mA	Analog interface fault
1 Hz modulation between 3 and 5 mA	Maintenance signal
Every 10 seconds for 1 second 3 mA	Warning signal (configured on delivery: disabled)

- Display in Transmitter (when fitted):
  measured value, unit of measurement and gas type, e.g.:



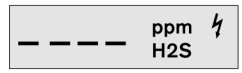
During measurement the following special symbols may be displayed:

– When the measurement range of the sensor has been exceeded: » ↑↑↑↑ «, e.g.:

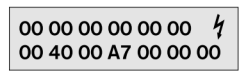
At any time the upper right corner of the display may display information about the status of the device:

– When there is a warning: » i «, e.g.:
  Display of warning in clear text –
  see "Maintenance and Configuration Menus", page 26.

– When there is a fault: » ϟ «, e.g.:



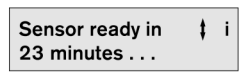
  Display of error code during measurement:
  Press **[ESC]** key and keep pressed, display e.g.:
  When there is no fault or warning pending, all error codes are set at **»00«**.
  The error codes are designed for locating faulty functions rapidly in co-operation with DrägerService.



  Display of fault messages in maintenance menu, see "Maintenance and Configuration menus", page 25.

In addition to the device status information, the upper right corner of the display may display information about the status of the analogue interface:

– When a maintenance signal is given to the control unit instead of a measured value: » ↕ « e.g.:



– When the measured value is too small for analogue transmission: » ↓ « e.g.:

– When the measured value is too high for analogue transmission: » ↑ « e.g.:

– When the analogue interface is set to a defined signal (fixed current, fault, maintenance or multidrop) by the user: » ⧫ « e.g.:

Maintenance

Maintenance Intervals

Before operation:

- Check calibration, see pages 28 to 30.
- Check signal transmission to control unit and alarm triggering, see 31 to 32.

At regular intervals,
as specified by those responsible for the gas detection system:

- Check dust filter, replace when necessary.
- Check signal transmission to control unit, and alarm triggering, see 31 to 32.

When a sensor-specific selective filter has been used:

- Replace selective filter –
  For capacity of selective filter to be used – see appropriate Sensor Data Sheet.

At regular intervals depending on the sensor used:

- Carry out calibration, see pages 28 to 30.
  The interval for regular calibration depends on the sensor used and the conditions of use.
  The transmitter calculates when calibration would next be due under consideration of the configured calibration interval (see also "Configuring calibration interval", page 38). This can be requested via the built-in display or via HART-compatible communication, see page 27.
  Sensor-specific calibration, see Sensor Data Sheet.

Every six months:

- Arrange for inspection by trained personnel.
  The inspection intervals in each individual case are influenced and if necessary shortered by technical safety considerations, engineering processes and the technical requirements of the equipment.
  We recommend a DrägerService contract which also covers repairs.

When necessary:

- Replace sensor, see pages 18.

Replacing Sensor

Only by trained personnel or DrägerService.

The sensor can be replaced, when necessary, without interrupting the power supply in the Ex-area.

Use only DrägerSensors designed for use with the Polytron 2 transmitter.

- In **»MAINTENANCE«** menu, request **»SENSOR REPLACEMENT«** function, see page 30.

1 Remove bayonet ring from transmitter; remove sensor.

2 Disconnect sensor.

- Take new sensor out of packaging. Make sure that the sensor is designed for use with Polytron 2.
- If fitted, remove short-circuit bridge from sensor plug.

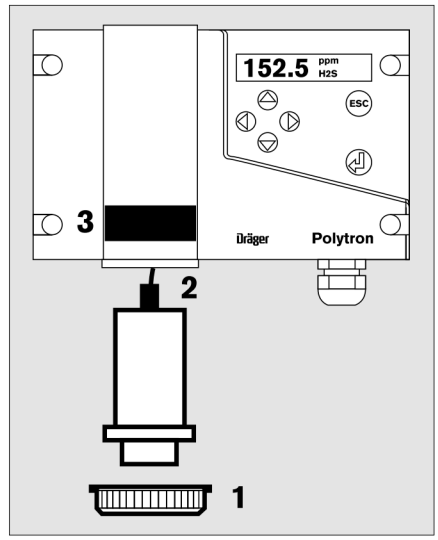
2 Fit connector to sensor and insert cable and sensor into transmitter.

1 Secure sensor in transmitter with bayonet ring.

3 Mark transmitter with label enclosed in packaging. It will then be easy to identify the type of gas for which the transmitter is intended if there is a mains failure or a Polytron 2 Non Display transmitter is used.

- Check sensor function.

– If the sensor used before is identical to the new one (same part no.), the transmitter will completely keep its configuration. Otherwise the transmitter will be configured with the default values (see sensor data sheet). Also see chapter "Sensor Lock", page 38.



Disposal of electrochemical Sensors:

- Dispose as special waste
- Do not throw into fire
- Do not force open, danger of corrosion

Observe local waste disposal regulations.
Information can be obtained from local environmental and government offices, as well as from waste disposal contractors.

Method of Operation

for Maintenance and Configuration

Choice of methods:
- keypad with integrated display on transmitter,
- a HART-compatible hand-held terminal * or
- a HART-compatible central control unit *.
- Polytron 2 HHT (Non Display Version with HHT connector only).

The keypad version and the Polytron 2 HHT is operated via 6 keys – 4 cursor keys [▲, ▼, ◀, ▶], an Escape key **[ESC]** and an Enter key [↵] – and the display.

Keys **[▲]**, **[▼]**	changing menu items / functions changing symbols / figures at cursor position changing specifications
Keys **[◀]**, **[▶]**	changing cursor position
Key **[↵]**	acknowledging entries acknowledging messages
Key **[ESC]**	return to previous menu re-enter at previous point in a function (to end a function without accepting an entry)

Menu Structure

Summary on pages 20.
Besides measurement there is also menu operation.
Menu operation contains two groups of functions, maintenance and configuration. A **different** password must be entered to obtain access to **each** group of functions. The password for the group configuration enables also access to the group maintenance.

Maintenance menu

This level covers the routine tasks required for the regular maintenance of the transmitter.
Access should be given to repair department personnel.
The maintenance password enables only access to this group of functions.

Configuration menu

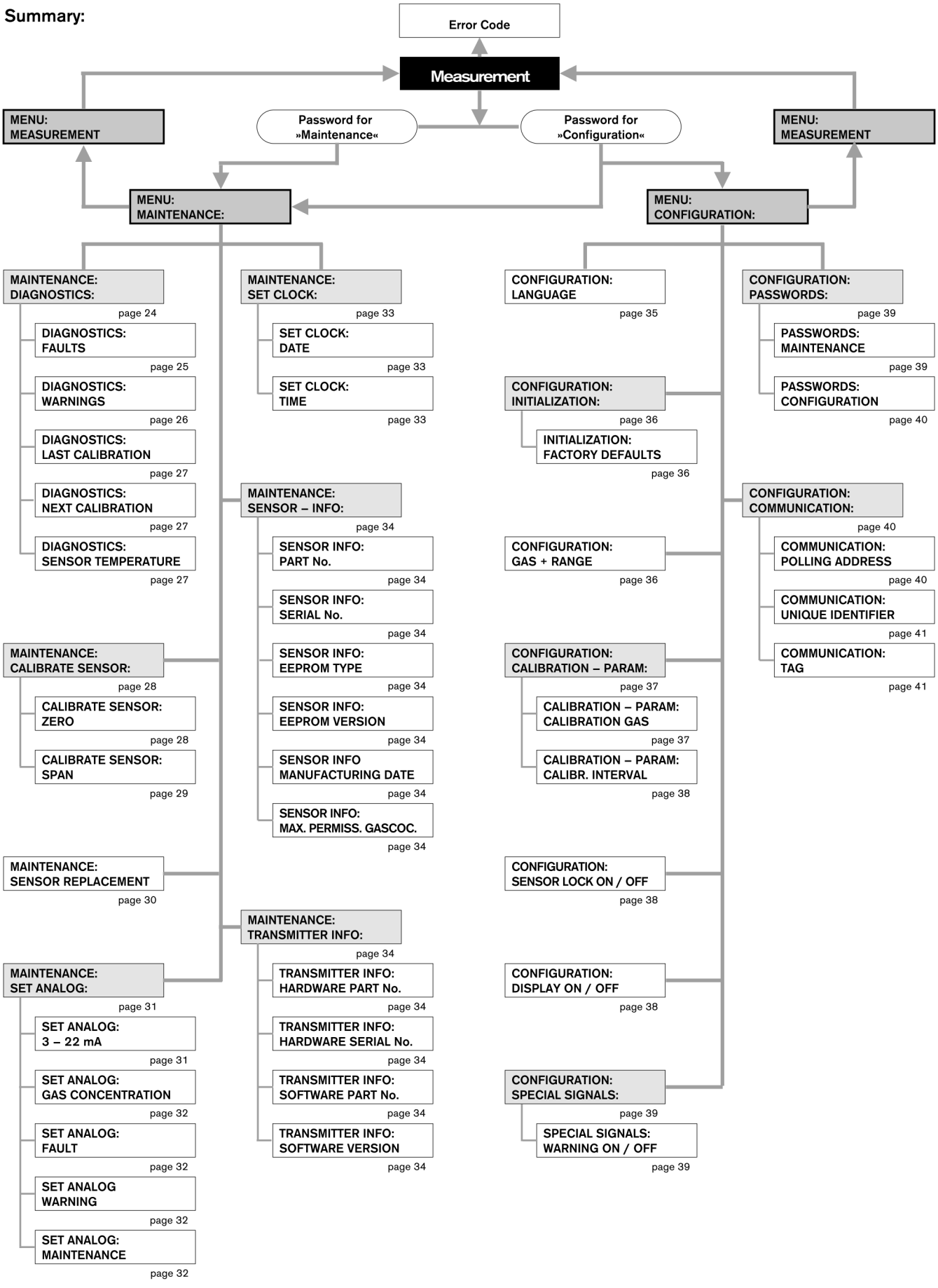
The individual transmitters and sensor parameters are configured at this level.
Access should be given to authorized personnel in the measurement and control or health and safety departments. Both the maintenance and the configuration menus can be accessed with the configuration password.

The passwords for the maintenance and configuration menus can be changed, see pages 39.

Setting on delivery:
Password for **»MAINTENANCE«** menu **1**
Password for **»CONFIGURATION«** menu **2**

* On request, an extended documentation is available for the implementation of the "Transmitter specific Commands".

Summary:


Error Code
Measurement
MENU: MEASUREMENT
Password for »Maintenance«
Password for »Configuration«
MENU: MEASUREMENT
MENU: MAINTENANCE:
MENU: CONFIGURATION:
MAINTENANCE: DIAGNOSTICS:
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SENSOR INFO: PART No.
page 34
SENSOR INFO: SERIAL No.
page 34
SENSOR INFO: EEPROM TYPE
page 34
SENSOR INFO: EEPROM VERSION
page 34
SENSOR INFO MANUFACTURING DATE
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SENSOR INFO: MAX. PERMISS. GASCOC.
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TRANSMITTER INFO: HARDWARE PART No.
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CONFIGURATION: LANGUAGE
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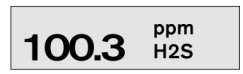
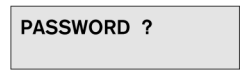
Entering Password

during measurement, display e.g.:



- Press **[↵]** key, device switches to password entry:



- Enter password:
  Enter number or letter with **[▲]** and **[▼]** keys –
  change position of cursor with **[▶]** key and enter next number or letter.

  When password is complete:
  Display, e.g. password for maintenance configured on delivery:

- Press **[↵]** key, device switches to menu operation:

  Measurement of concentration and output via the 4 to 20 mA output interface continue while menu is being operated with the exception of a few functions.

- Depending on authority for access a menu can then be selected with **[▲]** or **[▼]** key.

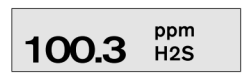
  Selection:
  »MEASUREMENT«, **»MAINTENANCE:«** or **»CONFIGURATION:«**

- Press **[↵]** key, to call up sub-menu selected, e.g.:
- Press **[▲]** or **[▼]** keys, to select a function within a sub-menu, e.g.:

- Press **[↵]** key, to call up function selected.
  The various functions in the maintenance and configuration menus are described in detail below.
- Press **[↵]** key, to end function.
- Press **[ESC]** key –
  to return to menu level above, e.g.:

  In the highest level of the menu, measurement is given when the **[ESC]** key is pressed.
  In the highest level of the menu, measurement can also be selected by pressing **[▲]** key once or several times.

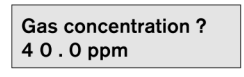
- Press **[↵]** key, to return to measurement with display of measured value, e.g.:



Basic principles

Entering figures

Within the different functions, figures need to be entered at appropriate points. Requests for entries are made in the top line and have a **» ? «** at the end of the text.
At the same time the bottom line comes up with the last figure entered overlayed by a cursor, e.g.:



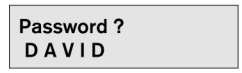
- Press **[◀]** or **[▶]** key,
  to change position of cursor. In the process, any decimal points are automatically skipped.

- Press **[▲]** or **[▼]** key, to change figure at cursor position.
  Nonsensical entries such as » .1 «, » -2-.22 «, »-.3«, »44.-4« are not accepted.

  Keeping a key pressed is treated as repeated activation of that key.
- Press **[↵]** key, number entered is accepted and tested for whether it is above or below range.
  If number entered is outside permissible range of entries a message is given.
- Press **[↵]** key, to acknowledge message – number previously entered is indicated on bottom line after this acknowledgement.

Entering text

Within the different functions, text needs to be entered at appropriate points. Requests for entries are made in the top line and have a **» ? «** at the end of the text.
At the same time, the cursor shows the last text entered on the bottom line, e.g.:
Exception: when entering password during measurement (see page 21).

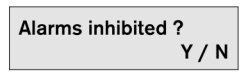


- Press **[◀]** or **[▶]** key, to change position of cursor.
- Press **[▲]** or **[▼]** key, to change symbol at cursor position. If **[▲]** or **[▼]** key is activated before this, all symbols to right of cursor position are deleted.
  Keeping a key pressed is treated as repeated activation of that key.
- Press **[↵]** key, to accept text entered.

Entering decisions

Within the different functions, decisions need to be taken at appropriate points. Requests for decisions to be entered have a **» ? «** at the end of the text.
At the same time, the options for selections are shown on bottom line.

The options for decision are separated from each other by **» / «**. The cursor remains on the "safe" position, e.g.:



- Press **[◀]** or **[▶]** key,
  to change position of cursor.
- Press **[↵]** key,
  to accept decision selected.

Entering settings

Within the different functions settings need to be made at appropriate points.

Requests for settings to be entered have a **» ? «** at the end of the text.
At the same time, the last setting made is shown on the bottom line.

The cursor is **not** used to show settings.

- Press **[▲]** or **[▼]** key, to select different setting, e.g.:

  Keeping a key pressed is treated as repeated activation of that key.

- Press **[↵]** key, to accept setting selected.

Handling messages

Within the different functions, messages are issued at appropriate points.
These are identified by a **» ! «** at the end of the text, e.g.:

- Press **[↵]** key, to acknowledge message.

Maintenance Menu

The maintenance menu contains those functions which are necessary for the regular maintenance of the transmitter.

There are various sub-menus / function within the menu.
Most of the sub-menus also contain a range of functions – summary, see page 20.

Selecting sub-menus:

– Within the maintenance menu – display:

MENU:
MAINTENANCE:

- Press **[↵]** key to request **»MAINTENANCE: DIAGNOSTICS:«** sub-menu, display:

MAINTENANCE:
DIAGNOSTICS:

- Use **[▲]** or **[▼]** key to select a sub-menu.

  Select from:
  »DIAGNOSTICS:«
  »CALIBRATE SENSOR:«
  »SENSOR REPLACEMENT«
  »SET ANALOG:«
  »SET CLOCK:«
  »SENSOR INFOS:« and
  »TRANSMITTER INFOS:«

Diagnosis

The **»MAINTENANCE: DIAGNOSTICS:«** sub-menu contains all the functions which are important for preventive maintenance measures or for checking for possible faults in functioning.
For all of them, it is possible to call up both status and a series of variables.

- Press **[↵]** key, to call up **»DIAGNOSTICS:«** sub-menu, display:

DIAGNOSTICS:
FAULTS

- Use **[▲]** or **[▼]** key to select one of five functions:

  »FAULTS«
  »WARNINGS«
  »LAST CALIBRATION«
  »NEXT CALIBRATION«
  »SENSOR TEMPERATURE«

Faults display

The **»DIAGNOSTICS: FAULTS«** function is used to call up any machine faults. The information is given in clear text.

If the special » ϟ « symbol appears in the top right hand corner of the display, it means that there is a fault.

- Select **»DIAGNOSTICS: FAULTS«** function.
- Press **[↵]** key to call up function, display e.g.:

Analog interface failure ! ϟ

- Press **[↵]** or **[▼]** key repeatedly to have all the messages there are displayed in sequence.
  The function ends when no more messages remain.

  Alternatively, fault list may be "scrolled" with **[▲]** or **[▼]** keys.

  Remedies, see table.

Fault message	Cause	Remedy
Microprocessor fault ! ϟ	A fault has been detected within microprocessor system.	Switch off power supply for about 1 second or more. If fault recurs: call DrägerService to check transmitter.
Microproc. EEPROM data not valid ! ϟ	Microprocessor EEPROM contains invalid data.	Call DrägerService to check transmitter.
Sensor EEPROM data not valid ! ϟ	Sensor EEPROM contains invalid data, or no sensor connected.	Call DrägerService to check transmitter. Or: replace sensor, page 18.
Supply voltage too low ! ϟ	Power supply to transmitter is too low.	Check voltage of power supply and loop resistance.
Pre-amplifier fault ! ϟ	A fault has been detected within pre-amplifier.	Call DrägerService to check transmitter.
Sensor failed self-test ! ϟ	Automatic sensor self-test has detected a fault in sensor.	Replace sensor, page 18.
Calibration incorrect ! ϟ	Sensor sensitivity calculated during the last calibration too low, or incorrect calibration data in sensor EEPROM.	Repeat calibration. Check concentration of calibration gas; observe effects of adsorption in pressure reducer and tubing. If unsuccessful, replace sensor, page 18.
Analog interface fault ! ϟ	Power supply to transmitter is too low. Fault detected during the internal check of the analogue interface.	Check voltage of power supply and loop resistance. Call DrägerService to check transmitter.
Sensor lock activated ! ϟ	The function "Sensor Lock" is activated.	Switch sensor lock off, page 38.

If knowledge the error code (see page 16), a detailed location of warnings or faults is possible in co-operation with DrägerService.

Warnings display

The **»DIAGNOSTICS:WARNINGS«** function is used to call up accumulated warnings.

Warning messages give the operator the opportunity to carry out preventive maintenance measures. If the special » i « symbol appears in the top right hand corner of the display it means that there is a warning.

- Select **»DIAGNOSTICS: WARNINGS«** function.
- Press **[↵]** key to call up function, display e.g.:

  Calibr. interval exceeded ! i
- Press **[↵]** key repeatedly to have all the messages there are displayed in sequence.
  The function ends when no more messages remain.

  Alternatively, warning list may be "scrolled" with **[▲]** or **[▼]** keys.
  For precise meaning of warning messages and remedies, see table.

Warning message	Cause	Remedy
Calibr. interval expired ! i	Calibration interval for sensor has expired.	Re-calibrate sensor, page 28.
Calibration invalid ! i	Permissible measuring range has been exceeded. Permissible temperature range too low or too high. Gas exposure (time x concentration) has been exceeded.	Re-calibrate sensor, page 28.
End of sensorlife ! i	Sensor 90 % used up. Concentration of calibration gas too low.	Fit new sensor, page 18. Check concentration of calibration gas; observe effects of adsorption in pressure reducer and tubing.
Major measurement error ! i	Temperature outside specified range. Sensor current too high (measuring range exceeded).	Return temperature to specified range. Reduce gas concentration.
Sensor ! warming up i	Sensor in warming-up phase.	Wait until sensor has warmed up completely.
Set clock ! i	Internal real-time clock holds no longer valid time.	Re-set date and time, page 33.
Change lithium battery ! i	Built-in Lithium battery is flat. If there is power failure, date and time will be lost.	Call DrägerService to fit new lithium battery.

Date of last calibration display

- Select **»DIAGNOSTICS: LAST CALIBRATION«** function.
- Press **[↵]** key to call up function.
  Display: date when sensor was last calibrated, e. g.:

Last calibration
26. Oct. 1995

Date of next calibration display

- Select **»DIAGNOSTICS: NEXT CALIBRATION«** function.
- Press **[↵]** key to call up function.
  Display: date when sensor might need to be recalibrated, under normal operating conditions, e. g.:

Next calibration
23. Nov. 1995

Depending on the individual application or requirements for accuracy, the length of the default calibration interval can be reduced or extended to the maximum calibration interval (see sensor data sheet) using the **»CONFIGURATION: CALIBRATION PARAM: CALIBR. INTERVAL«** function.

Temperature of sensor display

- Select **»DIAGNOSTICS: SENSOR TEMPERATURE«** function.
- Press **[↵]** key to call up function. Display: actual temperature of sensor in °C, e. g.:

Sensor temperature
25.6 Deg. C

Calibration

The **»MAINTENANCE: CALIBRATE SENSOR:«** sub-menu contains all the functions required to calibrate the sensor.

When an oxygen sensor is fitted, the **»CALIBRATE SENSOR: ZERO«** function carries out a sensor check.
The function does not result in calibration as zero point does not need to be calibrated for oxygen sensors.

However, a check should always be carried out using the **»CALIBRATE SENSOR: ZERO«** function.

The sensor must be warmed-up before calibration.
For warming-up time see Sensor Data Sheet.

- Press **[↵]** key to call up **»CALIBRATE SENSOR:«** sub-menu display:

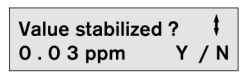
- Select either one function or the other with **[▲]** or **[▼]** key:
  »ZERO« or
  »**SPAN«**.

Calibrating zero point

Within this function the output of the maintenance/calibration signal is given instead of the output of concentration via the 4 to 20 mA interface.

- Select **»CALIBRATE SENSOR: ZERO«** function.

- Press **[↵]** key to call up function, display:
  For all sensors, except sensors for oxygen:
  Zero gas = ambient air, free from measuring gas or any other interfering gases, without calibration adaptor, or
- fit calibration adaptor, 68 06 978.
- Pass nitrogen through the calibration adaptor at a flow of approx. 0.5 L/min – **except for oxygen sensors**, synthetic air may be used.

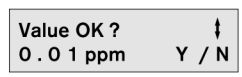


- Press **[↵]** key, display e.g.:

  Wait for measured value to stabilize (See Sensor Data Sheet for maximum time) – confirm decision with "yes" (Y); display:

For oxygen sensors:
Zero cannot be calibrated for these sensors. Zero is merely checked.

- Press **[↵]** key
  to display new measured value as a check of calibration; display e.g.:



- Confirm decision with "yes" (Y);
  display:

Remove gas !

- Switch off calibration gas and remove calibration adaptor.
- Press **[↵]** key – to confirm message, display:

Value ‡ alarm ?
0 . 0 1 ppm Y / N

- Wait until measured value is outside alarm range set at the central control unit –
  confirm decision with "yes" (Y); Function ends.

Calibrating sensitivity

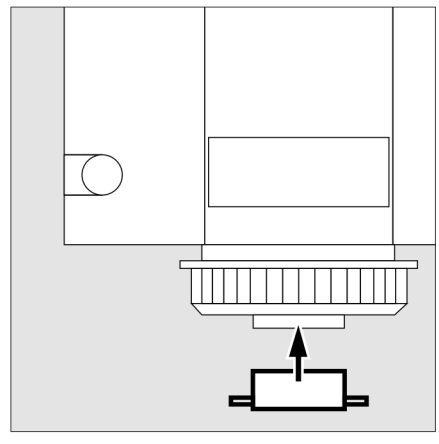
Within this function the output of the maintenance/calibration signal is given instead of the output of concentration via the 4 to 20 mA interface.

Be careful about correct sequence.
First check zero point and correct if necessary;
check sensitivity immediately and calibrate, if necessary.
Never calibrate sensitivity before zero point.

If the sensor is to be calibrated with a substitute gas (provided the sensor has been specified for it), it is necessary to configure the calibration gas accordingly once – see Configuring calibration gas, page 37.

- Use commercial calibration gas or calibration bottle and ampoules of test gas, if available.
  Observe Sensor Data Sheet.

  A calibration is possible with a gas concentration of up to 100 % of the highest adjustable measuring range, regardless of the set measuring range.



  When using calibration gas:

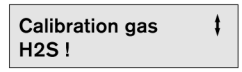
- Fit calibration adaptor 68 06 978 and pass calibration gas through it with a flow of 0.5 L/min.

  When using ampoules of test gas:

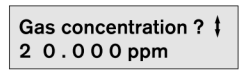
- Follow instructions on calibration bottle and instructions enclosed with ampoules of test gas.

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.

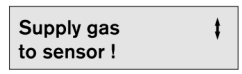
- Select **»CALIBRATE SENSOR: SPAN«** function.
- Press **[↵]** key to call up function, display of calibration gas chosen:



- Press **[↵]** key, display e.g.:



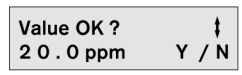
- Enter the concentration of calibration gas.
  The concentration used for the last calibration will be given.
- Press **[↵]** key, display e.g.:



- Pass calibration gas through the calibration adaptor at a flow of about 0.5 L/min or smash ampoule of test gas.
- Press **[↵]** key, display e.g.:

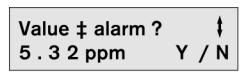
  Wait for measured value to stabilize, see Sensor Data Sheet for maximum times – confirm decision with "yes" (Y); display:

- Press **[↵]** key, to display the new measured value as a control for calibration; display e.g.:



- Confirm decision with "yes" (Y); display:

- Shut off calibration gas and remove calibration adaptor or disconnect calibration jar.
- Press **[↵]** key – to confirm message; display e.g.:



- Wait until measured value is outside the alarm range set at the central control unit – confirm decision with "yes" (Y); Function ends.

Replacing sensor

Using this sub-menu, a sensor may be replaced during operation without triggering a fault alarm in the central control unit. It also ensures that all sensor data in the microprocessor can be stored in the sensor's memory (EEPROM) before the sensor 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 **»MAINTENANCE: SENSOR REPLACEMENT«** function.
- Press **[↵]** key to call up function.

- The maintenance/calibration signal is given on the interface, display:
- Remove old sensor, fit new sensor, see pages 18, display:

- Press **[↵]** key to exit function.

The signal for maintenance/calibration on interface remains until sensor has warmed up (see also "Readiness for Operation", page 15).

The warming-up time depends on the type and history of sensor (see sensor data sheet).

If an identical sensor (with same order no.) has just been connected, the configuration of the transmitter will stay as it is (gas type, measurement range, calibration gas, calibration interval).
Otherwise the sensor's pre-set values (see Sensor Data Sheet) will be transferred to the transmitter (if the function sensor lock is deactivated, see page 38).

Setting 4 to 20 mA analog interface

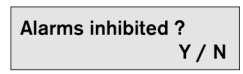
The 4 to 20 mA interface and its connection with the central control unit can be checked with this group of functions, to check alarm triggering for instance.
To do this, the interface can be set to certain currents within the 3 to 22 mA range. In addition, the special configuration signals for faults, warnings and maintenance/calibration can be entered.
After the function has been left, the analogue interface will return to its previous condition.

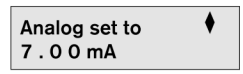
These functions can activate alarms, faults or warnings in the central control unit.
When necessary, the alarms in the central control unit must be blocked in advance.

- Select **»MAINTENANCE: SET ANALOG:«** sub-menu.
- Press **[↵]** key to call up sub-menu, display:
- Use **[▲]** or **[▼]** key to select one of five functions:
  »3–22 mA«
  »GAS CONCENTRATION«
  »FAULT«
  »WARNING«
  »MAINTENANCE«

Entering 3 to 22 mA

- Select **»SET ANALOG: 3–22 mA«** function.
- Press **[↵]** key to call up function, display:
- Confirm decision with "yes" (Y).
- Enter value, display e.g.:
- Press **[↵]** key, the current set is passed to the interface.
- Set new value and press **[↵]** key to enter – or
- Press **[ESC]** key, display:
- Confirm decision with "yes" (Y), to end function.

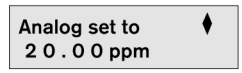




Entering gas concentration

- Select **»SET ANALOG: GAS CONCENTRATION«** function.
- Press **[↵]** key to call up function, display:

- Confirm decision with "yes" (Y).
- Enter value, display e.g.:



- Press **[↵]** key, the current set is passed to the interface.

  Example:
  For a setting of 20.0 ppm the interface is given a current of 10.4 mA (for a measuring range of 0 to 50 ppm appropriate to 4 to 20 mA).

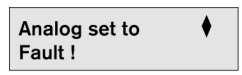
- Set new value and press **[↵]** key to enter – or
- Press **[ESC]** key, display:

- Confirm decision with "yes" (Y), to end function.

Entering fault

- Select **»SET ANALOG: FAULTS«** function.
- Press **[↵]** key to call up function, display:

- Confirm decision with "yes" (Y), to pass configured current for fault to interface, display:

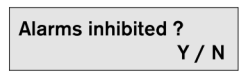


- Press **[↵]** key or **[ESC]** key, display:

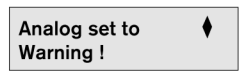
- Confirm decision with "yes" (Y), to end function.

Entering warning

- Select **»SET ANALOG: WARNINGS«** function.
- Press **[↵]** key to call up function, display:



- Confirm decision with "yes" (Y), to pass configured current for warning to interface, display:

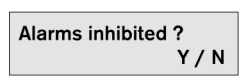


- Press **[↵]** key or **[ESC]** key, display:

- Confirm decision with "yes" (Y), to end function.

Entering maintenance / calibration

- Select **»SET ANALOG: MAINTENANCE«** function.
- Press **[↵]** key to call up function, display:



- Confirm decision with "yes" (Y), to pass configured current for maintenance / calibration to interface, display:

- Press **[↵]** key or **[ESC]** key, display:

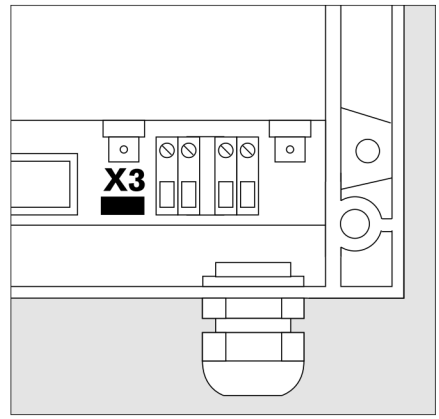
- Confirm decision with "yes" (Y), to end function.

Setting clock

The functions which are required for setting the real-time clock in the transmitter are grouped together in the **»MAINTENANCE: SET CLOCK:«** sub-menu.
For instance, the correct time is required when a gas calibration is carried out so that the correct date of the calibration can be saved.

On delivery the clock is set to central European time (CET).

A built-in battery ensures that the clock continues to function even if the transmitter loses electrical power.



If the transmitter is to be deactivated for a longer period
(e.g. for storage of spare parts):

- Remove the short-circuit bridge "X3" from circuit board. This will extend the life of the battery.

  The typical life of the battery when there is no electrical power supply to the transmitter is 3 years.

- Select **»MAINTENANCE: SET CLOCK:«** sub-menu.
- Press **[↵]** key to call up sub-menu, display:
- Use **[▲]** or **[▼]** key to select either the : **»DATE«** or **»TIME«** function.

```
SET CLOCK:
DATE
```

Entering date

- Select **»SET CLOCK: DATE«** function.
- Press **[↵]** key to call up function, display e.g.:
- The actual date of the real-time clock is displayed.

```
Date ?
1 6 . Sep . 1 9 9 3
```

- Change date, if necessary –
- Press **[↵]** key to accept changed date and to end function, or
- Press **[ESC]** key to end function without changing date.

Entering time

- Select **»SET CLOCK: TIME«** function.
- Press **[↵]** key to call up function, display e.g.:
- The actual time of the real time clock is displayed in the HH:MM (hours, minutes) format – on a 24-hour basis.
- Change time, if necessary –
- Press **[↵]** key to accept changed time and to end function, or
- Press **[ESC]** key to end function without changing the time.

```
Time ( H H : M M ) ?
1 4 : 0 7
```

Sensor-specific information display

All the functions which relate to information on the sensor are grouped together in the **»MAINTENANCE: SENSOR INFO:«** sub-menu.

- Select **»MAINTENANCE: SENSOR INFO:«** sub-menu.
- Press **[↵]** key to call up sub-menu, display:
- Use **[▲]** or **[▼]** key to select one of the six functions:

  »PART No.«: Part number of sensor fitted is displayed.

  »SERIAL No.«: Serial number of sensor fitted is displayed.

  »EEPROM TYPE«: EEPROM type of the sensor is displayed.

  »EEPROM VERSION«: Number of the EEPROM version of the sensor data memory is displayed.

  »MANUFACTURING DATE«: Sensor's production date is displayed.

  »MAX PERMISS GASCONC«: The maximum gas concentration permitted for sensor fitted is displayed.
- Press **[↵]** key to call up function, display e.g.:

  To end function:
- Press **[↵]** key or **[ESC]**.

SENSOR INFO:
PART No.

Manufacturing date
1 6 . Sep . 1 9 9 3

Transmitter-specific information display

All the functions which relate to information on the transmitter (without sensor) are grouped together in the **»MAINTENANCE: TRANSMITTER INFO:«** sub-menu.

- Select **»MAINTENANCE: TRANSMITTER INFO:«** sub-menu.
- Press **[↵]** key to call up sub-menu, display:
- Use **[▲]** or **[▼]** key to select one of four functions:

  »HARDWARE PART No.«: Main electronics part number is displayed.

  »HARDWARE SERIAL No.«: Main electronics serial number is displayed.

  »SOFTWARE PART No.«: Software part number is displayed.

  »SOFTWARE VERSION«: Version number of software is displayed.
- Press **[↵]** key to call up function, display e.g.:

  To end function:
- Press **[↵]** or **[ESC]**.

TRANSMITTER INFO:
HARDWARE PART No.

Software Version
20

Configuration Menu

The configuration menu contains those functions which are necessary for configurations to suit individual requirements.
There are various sub-menus within the configuration menu. Some sub-menus also contain some functions –
see summary, page 20.

Selecting sub-menus / functions:

– Within configuration menu – display:

MENU:
CONFIGURATION:

- Press **[↵]** key to call up **»CONFIGURATION:«** sub-menu, display:

CONFIGURATION:
LANGUAGE

- Use **[▲]** or **[▼]** key to select another sub-menu / function.

  Select from:
  »LANGUAGE«
  »INITIALIZATION:«
  »GAS + RANGE«
  »CALIBRATION PARAM:«
  »SENSOR LOCK ON/OFF«
  »DISPLAY ON/OFF«
  »SPECIAL SIGNALS:«
  »PASSWORDS:«
  »COMMUNICATION:«

Setting language

This function is used to change the language of the displays. On shipment the "English" language is configured.

- Select **»CONFIGURATION: LANGUAGE«** function.

Sprache ?
Deutsch

- Press **[↵]** key, to call up function, language already set is displayed, e.g.:
- Use **[▲]** or **[▼]** key to select one of the following languages: "German", "English", "French" or "Spanish".
- Press **[↵]** key to accept selected language and to exit from function.

Initialization of factory-set values

This function resets all the parameters of the transmitter to the factory-set values. Within this function, the maintenance/calibration signal is given via the 4 to 20 mA interface, if the HART mode is not activated. In case the transmitter is in HART mode, it remains in that configuration.

The parameters are set as follows:

- Measured value display on/off: on
- Sensor lock on/off: on
- Warning signal on/off: off
- Gas selection, if the sensor can be used to measure several gases.
- Units in display of measured values (normally in ppm).
- Measuring range for 4 to 20 mA interface.
- Configuration of calibration gas if sensor can be calibrated with a different gas.
- Calibration interval.
  Sensor-specific factory-set values are given in the Sensor Data Sheet.

- Select **»CONFIGURATION: INITIALIZATION:«** sub-menu.

- Press **[↵]** key, display:
- Select **»INITIALIZATION: FACTORY DEFAULTS«** function.

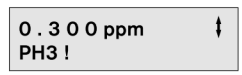
- Press **[↵]** key, display:
- Confirm decision with "yes", factory defaults are re-established, display:

- Press **[↵]** key to end function.

Configuring type of gas, units and measuring range

This function carries out the configuration of type of gas, measuring units and measuring range depending on the sensor used. Within this function, the output of the maintenance/calibration signal is given via the 4 to 20 mA interface.

- Select **»CONFIGURATION: GAS + RANGE«** function.



- Press **[↵]** key to display configuration currently set, e.g.:

  If configuration does not need to be changed:

- Exit sub-menu with **[ESC]** key.

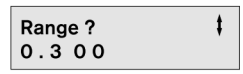
  Otherwise:

- Press **[↵]** key to display type of gas currently set, e.g.:

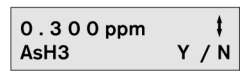
- Use **[▲]** or **[▼]** key to select desired type of gas (e.g. arsine).
  If the built-in sensor is only intended for measuring one type of gas, the type of gas cannot be changed.

- Press **[↵]** key to accept selected type of gas and to display unit of measurement currently set, e.g.:

- Use **[▲]** or **[▼]** key to select desired units of measurement (e.g. ppm).
- Press [**[↵]** key to accept the selected unit of measurement and to display the last measuring range set – when type of gas has been changed the factory setting of the sensor will be displayed – e.g.:



- Set desired measuring range.



- Press **[↵]** key to accept measuring range, display:

  To save data entered:
  Confirm decision with "yes", the configuration is saved, display:

- Press **[↵]** key to exit from sub-menu.

When there is no valid calibration data for the type of gas set, a warning or fault is given. Zero-point and sensitivity must then be calibrated without delay, see pages 28 to 30.

Configuring calibration parameters

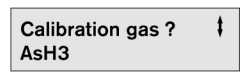
The functions of this sub-menu carry out the configuration of final parameter settings for calibration.
Within this function, the output of the maintenance/calibration signal is given via the 4 to 20 mA interface.

Configuring calibration gas

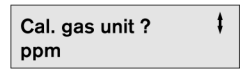
When a different calibration gas is required, the type of gas can be selected.
In each case, the unit for the concentration of calibration gas can also be set.

- Select **»CONFIGURATION: CALIBRATION PARAM: CALIBRATION GAS«** function.
- Press **[↵]** key to display calibration gas configuration currently set, e.g.:

- Press **[↵]** key to display calibration gas currently set e.g.:



- Use **[▲]** or **[▼]** key to select calibration gas desired (e.g. sulphur dioxide). When only one type of calibration gas is permitted for gas selected to be measured the calibration gas cannot be changed.
- Press **[↵]** key to accept type of calibration gas selected and to display units currently set for calibration gas, e.g.:



- Use **[▲]** or **[▼]** key to select desired unit of measurement (e.g. ppm).
- Press **[↵]** key to accept unit of measurement, display:

  To save data entered confirm decision with "yes".

  Configuration is saved, display:

- Press **[↵]** key to exit from sub-menu.

Configuring calibration interval

With this function the preset calibration interval of the installed sensor can be changed within the limits specified in the sensor data sheet. Once the calibration interval has expired (since the last calibration) the transmitter will give a warning message.

- Select **»CONFIGURATION: CALIBRATION PARAM: CALIBR. INTERVAL«** function.
- Press **[↵]** key to call up function and to display calibration interval currently set, e.g.:

Calibr. interval ?
2 8 days

- Use **[▲]** or **[▼]** key to set desired calibration interval.
- Press **[↵]** key to accept the new calibration interval, display:

OK – updated
data saved !

- Press **[↵]** key to end function.

Switching sensor lock on/off

When the function sensor lock is activated (on), only sensors with the same part no. will be accepted by the Polytron 2 transmitter.

When the function sensor lock is deactivated (off), all sensors designed for Polytron 2 are accepted by the transmitter. Once a sensor is plugged in, the electronics of the transmitter automatically adjusts to the new sensor type. **The configuration parameters of the Polytron 2 transmitter will change.**

- Select **»CONFIGURATION: SENSOR LOCK ON/OFF«** function.
- Press **[↵]** key to call up function and to display configuration currently set, e.g.:

Sensor lock ?
ON

- Use **[▲]** or **[▼]** key to select ON or OFF.
- Press **[↵]** key to accept selected configuration and to end function.

Switching measured value display on/off

This function is used to switch the display of concentration during measurement on or off.
When the measured value display is switched off, the unit of measurement and the type of gas continue to be displayed; only the display of gas concentration is suppressed. On delivery »ON« is set.

This setting has no effect on the output of concentration via the 4 to 20 mA interface.

- Select **»CONFIGURATION: DISPLAY ON/OFF«** function.
- Press **[↵]** key to call up function and to display configuration currently set, e.g.:

Display ?
ON

- Use **[▲]** or **[▼]** key to select ON or OFF.
- Press **[↵]** key to accept selected configuration and to end function.

Switching warning signal on/off

This function is used to switch the output of warning signals to the analogue interface on and off. On delivery, »OFF« is set.

If the presence of a warning shall be transmitted via the analogue interface, the warning signal must be switched on. If a warning occurs, the analogue interface current is switched to "fault" for one second every 10 seconds. The measuring signal continues to be given for the rest of the time.

- Select **»CONFIGURATION: SPECIAL SIGNALS: WARNING ON/OFF«** function.
- Press **[↵]** key to call up function and to display configuration currently set, e.g.:

- Use **[▲]** or **[▼]** key to select ON or OFF:
- Press **[↵]** key to accept configuration selected and to exit from function.

Changing password for maintenance and configuration menus

This sub-menu is used to change the password for maintenance and configuration groups of functions.

- Select **»CONFIGURATION: PASSWORD:«** sub-menu.
- Press **[↵]** key to call up sub-menu.
- Use **[▲]** or **[▼]** key to select one of two functions:
  »MAINTENANCE« or
  »CONFIGURATION«.

Changing password for maintenance

- Select **»CONFIGURATION: PASSWORD: MAINTENANCE«** function.
- Press **[↵]** key to call up function and to display password currently stored, e.g.:

- Enter password desired, up to 6 digits, e.g. DAVID.
- Press **[↵]** key, display:

  To save password, confirm decision with "yes" –

- Press **[↵]** key to accept password entered and to end function.

If 6 voids are selected for the password, the maintenance menu can be called up during measurement by pressing the **[↵]** key twice.

Changing password for configuration

- Select **»CONFIGURATION: PASSWORD: CONFIGURATION«** function.
- Press **[↵]** key to call up function and to display password currently entered, e.g.:

```
Password ?
2
```

- Enter password desired, up to 6 digits, e.g. PAUL.
- Press **[↵]** key, display:

```
Save password ?
P A U L          Y / N
```

  To save password, confirm decision with "yes" –
- Press **[↵]** key to accept password entered and to end function.

If 6 voids are selected for the password, the configuration menu can be called up during measurement by pressing the **[↵]** key twice.

Communication

The sub-menu **»CONFIGURATION: COMMUNICATION:«** contains all functions, which allow to read, respectively to write the most important parameters of the HART interface.

Configuring 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 advisable to choose a subsequent series of addresses, starting with address " 1 ".
This setting corresponds to the HART command #6 ("Write Polling Address").

- Select **»CONFIGURATION: COMMUNICATION: POLLING ADDRESS«** function.

```
COMMUNICATION:
POLLING ADDRESS
```

- Press **[↵]** key to call up function, display of polling address currently set, e.g.:

```
Polling Address ?
  0
```

- Use **[▲]**, **[▼]**, **[◀]** or **[▶]** keys to select desired polling address.
- Press **[↵]** key to accept selected polling address and to end function.

Note:
Execution of the function **»CONFIGURATION: INITIALIZATION: FACTORY DEFAULTS«** does not affect the polling address.

Read unique identifier

This function is used to read the unique identifier (unambiguous HART address), which is mandatory for correct addressing in almost all HART commands. Nevertheless, knowledge about the unique identifier is only required, if the central controller is unable to read the unique identifier using HART command #0 in short frame format or HART command #11. The displayed address corresponds to the address returned by HART command #0 ("Read Unique Identifier") or #11 ("Read Unique Identifier associated with Tag").

- Select **»CONFIGURATION: COMMUNICATION: UNIQUE IDENTIFIER«** function.

COMMUNICATION:
UNIQUE IDENTIFIER

- Press **[↵]** key to call up function. Display: unique identifier of transmitter, e.g.:

Unique Identifier
52 F7 00 3B 68

To end function:

- Press **[↵]** or **[ESC]** key.

Configuring Tag

The tag may be used to mark a specific transmitter and comprises 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 **»CONFIGURATION: COMMUNICATION: TAG«** function.

COMMUNICATION:
TAG

- Press **[↵]** key to display tag currently set, e.g.:

Tag ?
OVEN – 28

- Use **[▲]**, **[▼]**, **[◀]** or **[▶]** keys to set desired tag, max. length: 8 characters.
- Press **[↵]** key to accept selected tag and to end function.

Execution of the function **»CONFIGURATION: INITIALIZATION: FACTORY DEFAULTS«** does not affect the tag setting.

Technical Data

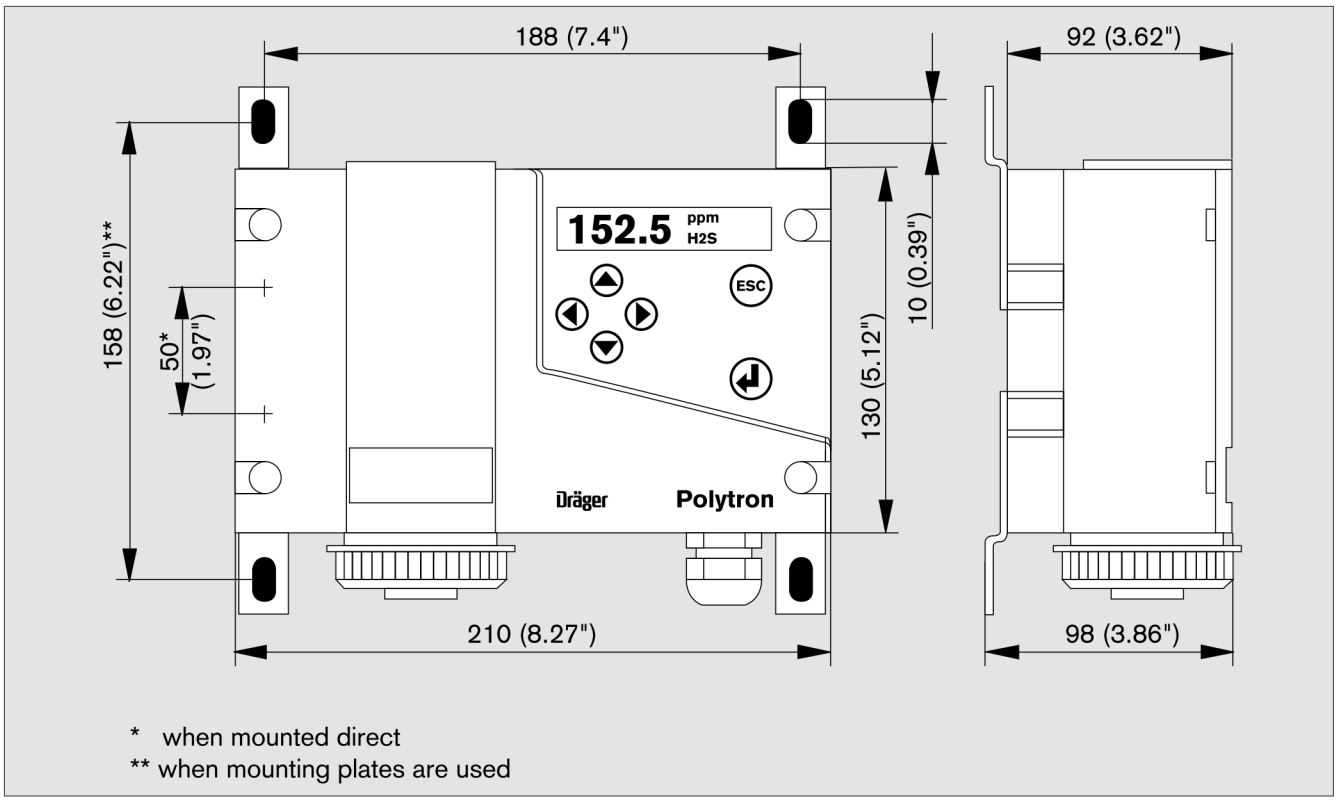
The range and technical characteristics of measurement depend on built-in sensor – see relevant Sensor Data Sheet.

Signal transmission to controller:	
Analog	
– Signal	4 mA to 20 mA
– Underrange	3.8 mA to 4 mA
– Overrange	20 mA to 20.5 mA
– Fault	< 3.2 mA
– Maintenance signal	4 mA ± 1 mA, 1 Hz modulation
Options which can be switched on or off:	
– Warning signal	Fault signal every 10 seconds for 1 second
Digital	HART-compatible, transmission by 2-core shielded cable
Power supply:	
analog (4...20 mA) signal transmission	
– at 3 mA current	16.5 V DC to 30 V DC
– at 22 mA current	min. 8.0 V DC at the transmitter
– superimposed AC-voltage	< 0.5 V_{pp}
digital signal transmission	16.5 V DC to 30 V DC
– superimposed AC-voltage	< 0.2 V_{pp} < 2.2 mV_{rms} (500 to 10 000 Hz)
Power input (without analog signal transmission)	typical 50 mW
Cable inlet	PG 13.5; cable diameter 6 mm (0.24") to 12 mm (0.47")
Wire cross-section	0.5 mm^2 (AWG 20) to 1.5 mm^2 (AWG 16)
Weight	approx. 1.8 kg / 4.0 lb.
Ambient conditions	specifications for sensor see Sensor Data Sheet
during operation	–40 to 65 °C (–40 to 150 °F) [1)] 700 to 1300 hPa 0 to 100% r.H., non condensating
during storage	–40 to 70 °C (–40 to 160 °F) 700 to 1300 hPa 0 to 100% r.H. , non condensating
CE marking	Equipment and protective systems for use in potentially explosive atmospheres (Directive 94/9/CE) Electromagnetic compatibility (Directive 89/336/EEC) max. influence on sensor: ≤ 2 x repeatability
Ingress protection	IP 67, according to EN 60 529

1) The readability of the display may be affected at temperatures below –20 °C (–5 °F).

Explosion protection	ATEX; DMT 01 ATEX E045X I M2 EEx ia: for –40 to +65 °C II 2G EEx ia IIC T6: for –40 to +40 °C II 2G EEx ia IIC T4: for –40 to +65 °C IEC; DMT 00 IEC 098 Ex ia IIC T4: for –40 to 60 °C Ex ia IIC T6: for –40 to 40 °C UL (Underwriters Laboratories Inc.) Class I; Div. 1; Groups A, B, C, D Class II; Div. 1: Groups E, F, G Temp. Code T6: for –40 to +40 °C Temp. Code T4: for –40 to +65 °C CSA (Canadian Standards Association) Class I; Div. 1; Groups A, B, C, D Temp. Code T6: for –40 to +40 °C Temp. Code T4: for –40 to +65 °C
Supply circuit (maximum values)	V_{max} = 30 V, I_{max} = 0.3 A, P_{max} = 700 mW

Dimensions



Principle of Operation

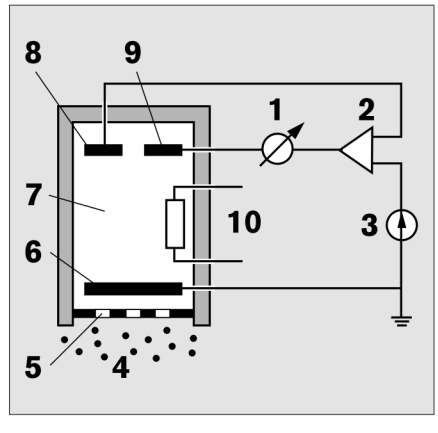
The transmitter consists of a housing, an electrochemical sensor (with embedded temperature sensor and data memory) and microprocessor-controlled electronics.
The transmitter housing is made of conductive plastic which prevents electrostatic charge and is not affected by solvents or acids and alkaline solutions.

Dräger electrochemical sensors are electrochemical measuring transducers for measuring the partial pressure of gases under atmospheric conditions.
The ambient air being monitored diffuses through a membrane into the liquid electrolyte in the sensor. The electrolyte contains a measuring electrode, a counter-electrode and a reference electrode. An electronic potentiostat-circuit ensures a constant electrical voltage between measuring electrode and reference electrode. Voltage, electrolyte and electrode material are selected to suit the gas being monitored so that it is transformed electrochemically on the measuring electrode and a current flows through the sensor. This current is proportional to the gas concentration.

At the same time, oxygen from the ambient air reacts at the counter-electrode electrochemically.

The current flowing through the sensor is amplified electronically, digitised and corrected for several parameters (e.g. the ambient temperature). The resulting measured value is given as an analog, 4 to 20 mA, signal as well as digital HART-compatible signal.

Design principle



1 Meter
2 Potentiostat
3 Direct current supply
4 Measured gas
5 Membrane
6 Measuring electrode
7 Electrolyte
8 Reference electrode
9 Counter-electrode
10 Temperature sensor

Order List

Name and Description	**Order No.**
Polytron 2 Transmitter for electrochemical sensors, with display and operator keypad	**83 14 400**
Polytron 2 Non Display Transmitter for electrochemical sensors, without display and operator keypad, with Polytron 2 HHT connector	**83 14 500**
Sensors	see Sensor Data Sheets
Accessories:	
Polytron 2 HHT hand-held terminal for Polytron 2 Non Display	**83 13 602**
Splash guard, calibration adapter, test-gas cylinders, calibration bottle, test gas ampoules, selective filter and dust filter	see Sensor Data Sheets

ATEX-Approval:

Pages 46 to 47.

IEC-Approval:

Pages 48 to 51.

UL-Approval

Page 52.

CSA-Approval

Page 53.

Declaration of Conformity

Page 54 to 55.

DMT

Translation

(1) # EC-Type Examination Certificate

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

(3) ## DMT 01 ATEX E 045 X

(4) **Equipment:** **Gas monitor type Polytron 2**

(5) **Manufacturer:** **Dräger Sicherheitstechnik GmbH**

(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 Deutsche Montan Technologie 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 01.2039 EG.

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

EN 50014:1997+A1+A2	General requirements
EN 50020:1994	Intrinsic Safety

(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 2G EEx ia II T4 (-40 °C≤tamb≤65 °C)
II 2G EEx ia II T6 (-40 °C≤tamb≤40 °C)
I M2 EEx ia I (-40 °C≤tamb≤65 °C)

Deutsche Montan Technologie GmbH
Essen, dated 28. March 2001

Signed: Jockers
DMT-Certification body

Signed: Wenzel
Head of special services unit

DMT

(13) Appendix to

(14) # EC-Type Examination Certificate

DMT 01 ATEX E 045 X

(15) 15.1 Subject and type
Gas monitor type Polytron 2

15.2 Description
Polytron 2 is an apparatus which is powered by a two-wire cable and simultaneously this cable is used to transmit data (4 to 20 mA signal). The apparatus may additionally comprise a display and/or a keypad. Depending on the sensor mounted, Polytron 2 is to detect different gases.
The ambient temperature range for Group II is depending on the temperature class
for T4: -40 °C to +60 °C
for T6: -40 °C to +40 °C

15.3 Parameters
Electrical data
Supply/data circuit (Terminal K1,K3 / K2,K4)

voltage	Ui	30	V
current	Ii	0,3	A
power	pi	0,7	W
internal capacitance	Ci	negligible	
internal inductance	Li	negligible	

(16) Test and assessment report
BVS PP 01.2039 EG as of 28.03.2001

(17) Special conditions for safe use
The measuring function for explosion protection under EN 50054 and EN 50057 is not the subject of this 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.

45307 Essen, 25.06.2001
BVS-Ad/Mi A 20000788

Deutsche Montan Technologie GmbH

DMT-Certification body

Head of special services unit

DMT

(1) # Type Examination Certificate

(2) **Electrical equipment for use in potentially explosive atmospheres**

(3) ## DMT 00 IEC 098

(4) **Equipment:** **Gas monitor type Polytron 2**

(5) **Manufacturer:** **Dräger Sicherheitstechnik GmbH**

(6) **Address:** **D – 23542 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 Deutsche Montan Technologie GmbH certifies that this equipment has been found to comply with:

IEC 60079-0:1998, (amendment 1)	General requirements
IEC 60079-11:1999	Intrinsic safety "i"

The examination and test results are recorded in confidential test and assessment report BVS PP 00.2091 IEC.

(9) 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.

(10) This Type Examination Certificate relates only to the design, examination and tests of the specified equipment in accordance with the afore mentioned IEC Publications concerning electrical equipment for potentially explosive atmospheres.
Further requirements may 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:

Ex ia IIC T4 (t_{amb} = - 40 °C to 60 °C)
Ex ia IIC T6 (t_{amb} = - 40 °C to 40 °C)

Deutsche Montan Technologie GmbH
Essen, dated 18 December 2000

DMT-Certification body

Head of special services unit

Am Technologiepark 1, 45307 Essen, Telefon (0201)172-1416, Telefax (0201)172-1716

DMT

(13) Appendix to

(14) # Type Examination Certificate

DMT 00 IEC 098

(15) 15.1 Subject and type

Gas monitor type Polytron 2

15.2 Description

The intrinsically safe gas monitor type Polytron 2 consists of a potted electronic board, an electrochemical cell and optionally a keyboard with display. These components are mounted in an electrostatically conductive housing. It is powered via a two wire cable, that also carries the data signal (4 – 20 mA).

15.3 Parameters

Electrical parameters for intrinsically safe supply (K1, K2 / K3, K4)

voltage	U_0	DC	30	V
current	I_0		0,3	A
power	P_0		300	mW
internal capacitance	C_i	negligible		
internal inductance	L_i	negligible		

(16) Test report
Nr. BVS PP 00.2091 IEC, dated 18.12.2000

(17) Special conditions for safe use

none

Am Technologiepark 1, 45307 Essen, Telefon (0201)172-1416, Telefax (0201)172-1716

INTERNATIONAL ELECTROTECHNICAL COMMISSION (IEC)
COMMISSION ELECTROTECHNIQUE INTERNATIONALE (CEI)

Ref. No.
BVS PP 00.2091 IEC

IEC SCHEME FOR CERTIFICATION TO STANDARDS FOR ELECTRICAL EQUIPMENT FOR EXPLOSIVE ATMOSPHERES (IECEx Scheme)

SYSTEME CEI POUR CERTIFICATION SELON LES NORMES RELATIVES AUX APPAREILS ELECTRIQUES DESTINES A ETRE UTILISES EN ATMOSPHERES EXPLOSIBLES (SYSTEME CEIEx)

IECEx ASSESSMENT AND TEST REPORT
RAPPORT CEIEx D'EVALUATION ET D'ESSAIS

Product *Produit*	**Gas monitor**
Name and address of the applicant *Nom et adresse du demandeur*	**Dräger Sicherheitstechnik GmbH** **D - 23542 Lübeck**
Name and address of the manufacturer *Nom et adresse du fabricant*	**Dräger Sicherheitstechnik GmbH** **D - 23542 Lübeck**
Rating and principal characteristics *Valeurs nominales et caractéristiques principales*	**Ex ia IIC T4 (t_{amb} = -40 °C to 60°°C)** **Ex ia IIC T6 (t_{amb} = -40 °C to 40°°C)**
Trade mark (if any) *Marque de fabrique (si elle existe)*	
Model/type Ref. *Ref. de type*	**Polytron 2**
Additional information (if necessary) *Information complémentaire (si nécessaire)*	

A sample of the product was tested and found to be in conformity with *Un échantillon de ce produit a été essayé et a été considéré conforme à la*	**PUBLICATION**	**EDITION**
	IEC 60079-0, Amendment 1	1998
	IEC 60079-11	1999
as shown in the Test Report, Ref. No. *comme indiqué dans le Rapport d'essais, numéro de référence*	BVS PP 00.2091 IEC 0 BVS PP 00.2091 IEC 11	

The Ex ATR is issued by the following Accepted Certification Body
Le Rapport ATR Ex est émis par l'organisme acepté de certification suivante

Deutsche Montan Technologie GmbH
Zertifizierungsstelle
Am Technologiepark 1
D-45307 Essen

2000-12-18
Date

Signature

ATR/CS/9905

INTERNATIONAL ELECTROTECHNICAL COMMISSION (IEC)
COMMISSION ELECTROTECHNIQUE INTERNATIONALE (CEI)

Ref. No.
DE / DMT / BVS PP 00.2091 IEC

IEC SCHEME FOR CERTIFICATION TO STANDARDS FOR ELECTRICAL EQUIPMENT FOR EXPLOSIVE ATMOSPHERES (IECEx Scheme)

SYSTEME CEI POUR CERTIFICATION SELON LES NORMES RELATIVES AUX APPAREILS ELECTRIQUES DESTINES A ETRE UTILISES EN ATMOSPHERES EXPLOSIBLES (SYSTEME CEIEx)

Supplement 1

IECEx ASSESSMENT AND TEST REPORT
RAPPORT CEIEx D'EVALUATION ET D'ESSAIS

Product *Produit*	**Gas monitor**
Name and address of the applicant *Nom et adresse du demandeur*	**Dräger SafetyAG & Co. KGaA** **D – 23542 Lübeck**
Name and address of the manufacturer *Nom et adresse du fabricant*	**Dräger SafetyAG & Co. KGaA** **D – 23542 Lübeck**
Rating and principal characteristics *Valeurs nominales et caractéristiques principales*	**Ex ia IIC T4 (t_{amb} = -40 °C to 65 °C)** **Ex ia IIC T6 (t_{amb} = -40 °C to 40 °C)**
Trade mark (if any) *Marque de fabrique (si elle existe)*	
Model/type Ref. Ref. de type	**Polytron 2**
Additional information (if necessary) *Information complémentaire (si nécessaire)*	
A sample of the product was tested and found to be in conformity with *Un échantillon de ce produit a été essayé et a été considéré conforme à la*	**PUBLICATION** IEC 60079-0 IEC 60079-11 **EDITION** 2000 1999
as shown in the Test Report, Ref. No. *comme indiquédans le Rapport d'essais, numéro de référence*	BVS PP 00.2091 IEC 0 BVS PP 00.2091 IEC 11

The Ex ATR is issued by the following Accepted Certification Body
Le Rapport ATR Ex est émis par l'organisme acepté de certification suivante

Deutsche Montan Technologie GmbH
Essen, den 6. Dezember 2001

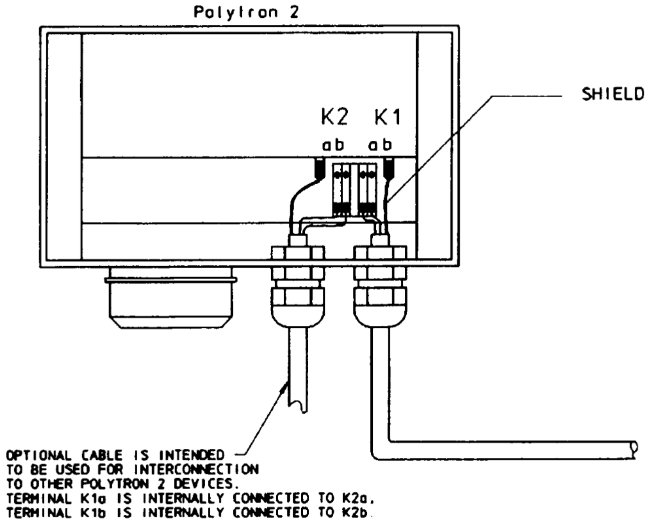
DMT-Certification body

Head of special services unit

Am Technologiepark 1, 45307 Essen, Germany, Phone +49 231 2491 0, Fax +49 231 2491 224

ATR/CS/BVS

HAZARDOUS AREA
CLASS I, GROUPS A, B, C, D



ENTITY PARAMETERS

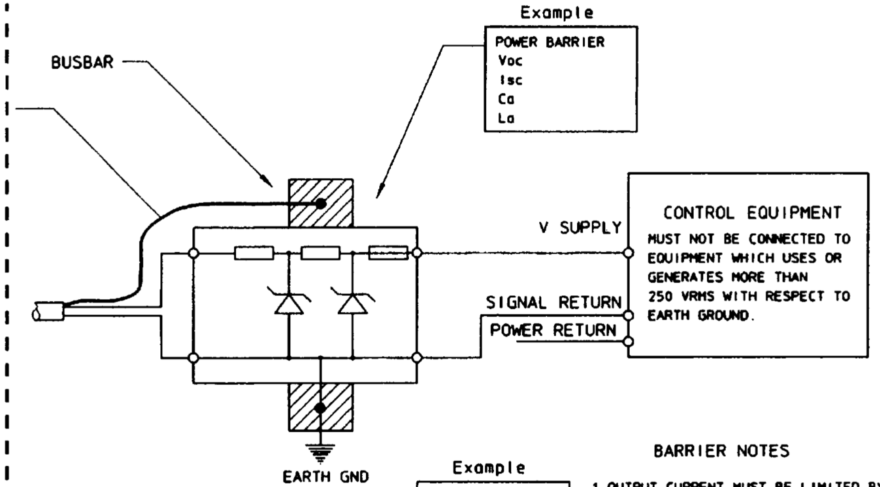
TERMINALS	VMAX	IMAX	Ci	Li	Pmax
K1(a,b)	30V	0.3A	0	0	700mW

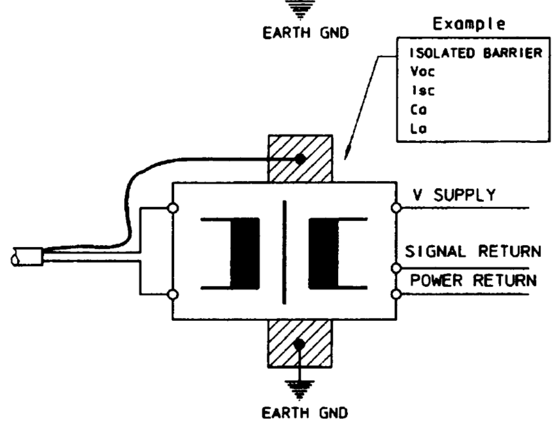
Vmax >= Voc
Imax >= Isc
Ci + C cable =< Ca
Li + L cable =< La

USE THE FOLLOWING PARAMETERS IF CABLE PARAMETERS ARE UNKNOWN.
CABLE CAPACITANCE: 60pF/ft
(L x Ccable=1000ft x 60pF/ft=0.06 uF)
CABLE INDUCTANCE: 0.2 uH/ft
(L x Lcable=1000ft x 0.2 uH/ft=0.2mH)

ALL INTRINSICALLY SAFE WIRING SHALL BE KEPT SEPERATE FROM NON-INTRINSICALLY SAFE WIRING. REFER TO ARTICLE 504 OF THE NATIONAL ELECTRICAL CODE.

SAFE AREA

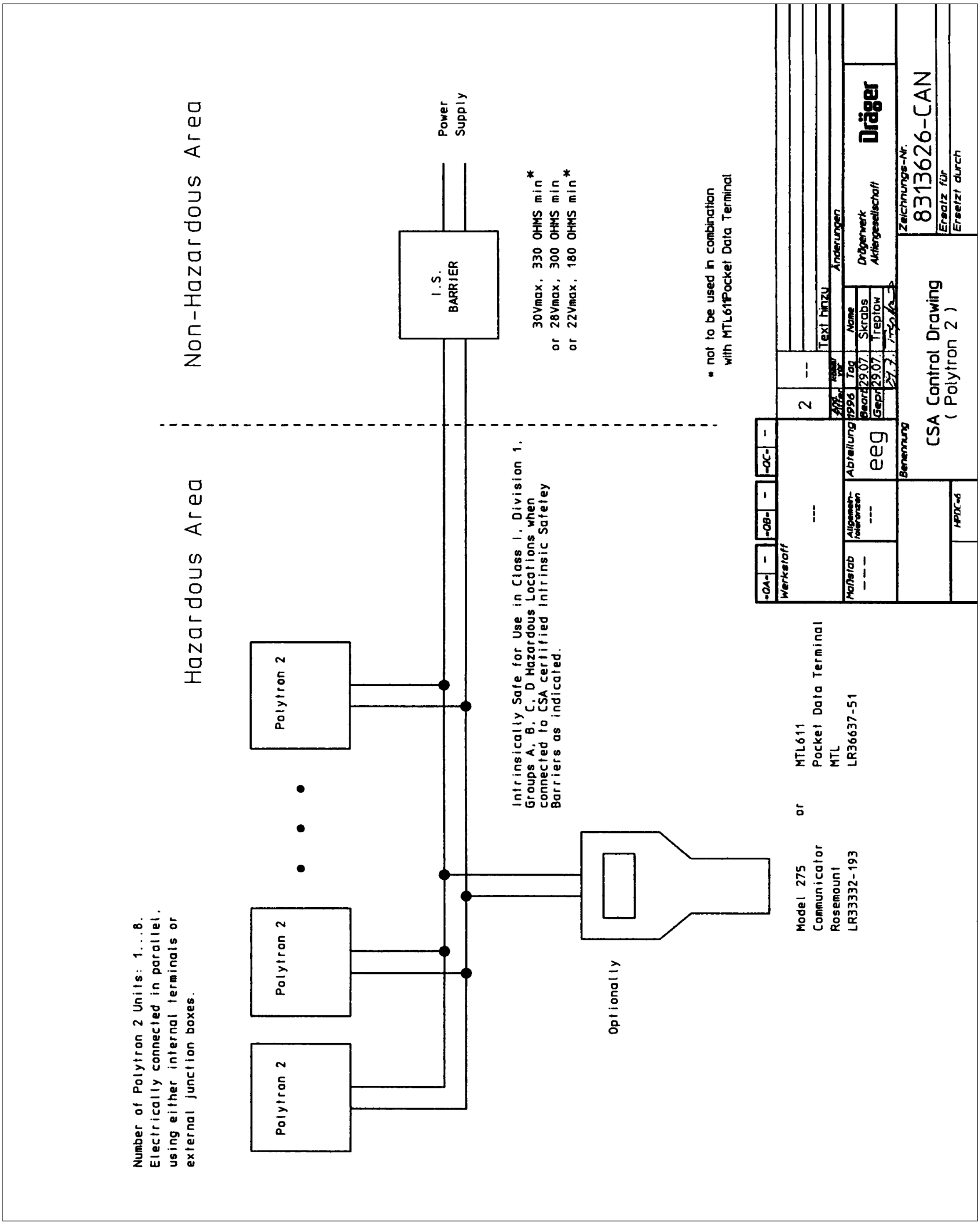




BARRIER NOTES

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.
3 SELECTED BARRIER INTRINSICALLY SAFE CIRCUITS SHALL BE APPROVED FOR AT LEAST CLASS I, DIV 1, Groups A-D.
4 TERMINATE BARRIER EARTH GROUND TO THE GROUND BUS OF THE POWER DISTRIBUTION PANEL. RESISTANCE TO GROUND MUST NOT BE GREATER THAN 1 OHM.
5 IF THE MAXIMUM POWER IS NOT SPECIFIED, IT CAN BE EVALUATED USING THE FORMULA Pmax = 1/4 x Vmax x Imax.
6 THE COMBINATION OF BOTH, MAX. VOLTAGE AND MAX. CURRENT MAY EXCEED THE IGNITION CURVE FOR RESISTIVE CIRCUITS. HOWEVER, IT IS ENSURED THAT THE SAFETY PARAMETERS OF ANY CERTIFIED INTRINSIC SAFETY BARRIER ARE WITHIN THE LIMITS OF THE RESISTIVE IGNITION CURVE.

-OA- – -OB- – -OC- –
Werkstoff ---
2 --
Änderungen
Maßstab ---
Allgemeintoleranzen ---
Abteilung eeg
1995 | Tag | Name
Bearb. 15.05. Heissler
Gepr. 15.05. Treplow
Drägerwerk Aktiengesellschaft
Dräger
Y
Benennung
UL Control Drawing
(Polytron 2)
Zeichnungs-Nr. 8313626-USA
Ersatz für
Ersetzt durch
HPDC-6


Non-Hazardous Area
Hazardous Area
Power Supply
I.S. BARRIER
30Vmax. 330 OHMS min*
or 28Vmax. 300 OHMS min
or 22Vmax. 180 OHMS min*
* not to be used in combination with MTL611 Pocket Data Terminal
Intrinsically Safe for Use in Class I, Division 1, Groups A, B, C, D Hazardous Locations when connected to CSA certified Intrinsic Safetey Barriers as indicated.
Polytron 2
Polytron 2
Polytron 2
Number of Polytron 2 Units: 1...8.
Electrically connected in parallel,
using either internal terminals or
external junction boxes.
Optionally
Model 275
Communicator
Rosemount
LR33332-193
or
MTL611
Pocket Data Terminal
MTL
LR36637-51
Text hinzu
Änderungen
Dräger
Drägerwerk Aktiengesellschaft
Zeichnungs-Nr.
8313626-CAN
Ersatz für
Ersetzt durch
CSA Control Drawing
(Polytron 2)
Benennung
Abteilung
eeg
Beard 29.07.
Gepr 29.07.
Skrabs
Treptow
Werkstoff
Maßstab
Allgemein-toleranzen

Dräger
SAFETY

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

Gasmesskopf Typ **Polytron 2**
Gas Detection Transmitter type **Polytron 2**

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

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

DMT 01 ATEX E 045 X

für / for

Gerätegruppe und -kategorie / Equipment Group and Category: **I M2, II 2G**
Zündschutzart / Type of Protection: **ia**
Explosionsgruppe / Explosion Group: **I, IIC**
Temperaturklasse / Temperature Class: **T4/T6**

ausgestellt von der benannten Stelle / issued by the notified body

DMT - Gesellschaft für Forschung und Prüfung mbH
Zertifizierungsstelle
Am Technologiepark 1
D-45307 Essen
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
Gasmesstechnologie-Entwicklung
Dräger Safety AG & Co. KGaA

Lübeck, 08.11.2001

Dokument-Nr. / document no.: 8316136-CE "01"
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Dräger
SAFETY

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

Gasmesskopf Typ **Polytron 2 mit Display**
Gas Detection Transmitter type **Polytron 2 w/ Display**

übereinstimmt mit den Anforderungen des Anhangs II, insbesondere Abschnitt 2.3.2, der Richtlinie 94/9/EG (Geräte und Schutzsysteme zur bestimmungsgemäßen Verwendung in explosionsgefährdeten Bereichen) und dass das Verfahren der internen Fertigungskontrolle des Anhanges VIII der Richtlinie angewandt wurde

is in conformity with the requirements of Annex II, especially clause 2.3.2, of Directive 94/9/EC (Equipment and protective systems intended for use in potentially explosive atmospheres) and that the procedure relating to internal control of production according of Annex VIII of the Directive is applied

für / for

Gerätegruppe und -kategorie / Equipment Group and Category: **II 3D**
max. Temperatur / max. Temperature: T_{max} = **65 °C**

Der Konformitätsbewertung wurde zugrunde gelegt / The Conformity Assessment is based on:

- EN 50281-1-1: 09/1998
  Elektrische Betriebsmittel zur Verwendung in Bereichen mit brennbarem Staub: Teil 1-1, Elektrische Betriebsmittel mit Schutz durch Gehäuse – Konstruktion und Prüfung /
  Electrical Apparatus for use in the presence for combustible dust: Part 1-1, Electrical Apparatus protected by enclosures – Construction and testing
- EN 50014: 06/1997 + A1+A2: 02/1999
  Elektrische Betriebsmittel für explosionsgefährdete Bereiche – Allgemeine Bestimmungen /
  Electrical Apparatus for potentially explosive atmospheres – General requirements

Ralf Drews
Gasmesstechnologie Entwicklung
Dräger Safety AG & Co. KGaA

Lübeck, 28.04.2003

Dokument-Nr. / document no.: SE20003 "00"
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