

## Stratos® PROFIBUS 2221 X pH

### Display

Simultaneous display of pH value/ORP and temperature; unit symbols as plaintext. Icons supply operating messages and signal unusual operating states. Status indicators provide information on the current operating status. Eye-catching alarm signaling by red, flashing LED.

### Calibration

Reliable reminder due to integrated calibration timer. Automatic electrode standardization with check of response time and drift by Knick Calimatic®. All conventional buffer sets can be selected. Alternatively, also manual calibration or direct input of zero point and slope for service purposes. Display of the electrode data after every calibration. Evaluation of the electrode status with Sensoface®.

### Sensor monitoring Sensocheck®

Maximum reliability due to continual monitoring of glass and reference electrode. Recognition of electrode defects, indication and alarm triggering.

### The facts

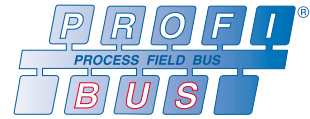
- Rugged, tightly sealed molded enclosure
- Wall, pipe/post or panel mounting
- Easy installation with pre-assembled enclosure and plug-in terminals
- Optical alarm signal by red LED
- Sensocheck® continual sensor monitoring
- GainCheck® automatic device self-test
- International user interface with icons
- Large, clear display
- °C/°F temperature scale
- Additional mode indicators for
  - Measuring mode
  - Calibration mode
  - Alarm
  - Online
  - Bus communication
  - Configuration
- Cal timer
- Communication according to the Profile for Analyzers Version 3.0
- Power supply via PROFIBUS PA
- Logbook
- Limit values, can be defined and read via PROFIBUS



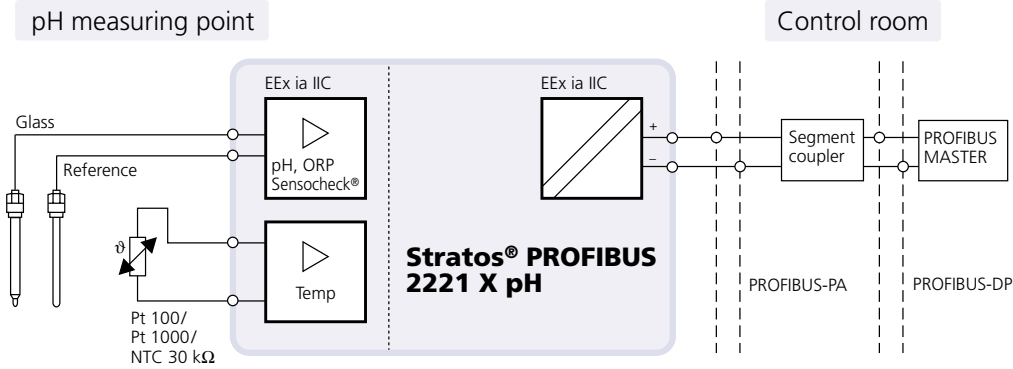
## Warranty 3 years!

### Warranty

Defects occurring within 3 years from delivery date shall be remedied free of charge at our works (carriage and insurance paid by sender).



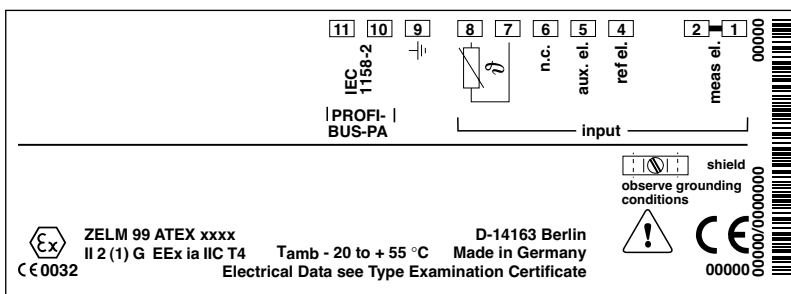
## Connection



## Product line

<b>Stratos® PROFIBUS</b>	Stratos® PROFIBUS 2221 X pH	Order No. <b>2221 X pH</b>
<b>Mounting accessories</b>	See Accessories chapter (page 121)	

## Terminal assignment



## Specifications

Measurement ranges	pH value 0.0 ... +14.00 mV value -1500 ... +1500 mV Temperature -20.0 ... +130.0 °C
Meas. error	pH value <0.02 ±1 count mV value <1 mV ±1 count Temperature <0.5 K <sup>1)</sup> ±1 count
Display	LC display, 7-segment Measured value display: pH/mV value, temperature Red alarm LED: Error message
Temperature input	Pt 100/Pt 1000/NTC 30 kOhm
Sensor monitoring	Sensocheck® monitoring of glass and reference electrode
Electrode standardization	<ul style="list-style-type: none"> <li>- Automatic calibration with Calimatic®, buffer sets: <ul style="list-style-type: none"> <li>-00- Knick technical buffer 2.00/4.01/7.00/9.21</li> <li>-01- Mettler Toledo technical buffer 2.00/4.01/7.00/9.21</li> <li>-02- Merck/Riedel de Haën 2.00/4.00/7.00/9.00/12.00</li> <li>-03- Ciba (94) 2.06/4.00/7.00/10.00</li> <li>-04- Mettler Toledo (USA) 4.00/7.00/10.01</li> <li>-05- Standard buffer NIST 4.006/6.865/9.180</li> <li>-06- HACH 4.00/7.00/10.18</li> <li>-07- WTW technical buffer 2.00/4.01/7.00/10.00</li> </ul> </li> <li>- Manual input of individual buffer values (MAN)</li> <li>- Data input premeasured electrodes (DAT)</li> </ul>
Calibration timer	0 ... 9999 h
Communication interface	<p>Protocol: PROFIBUS PA via segment coupler or link to SPC, PC, PLC</p> <p>Profile: Profile for Analyzers Version 3.0 (PNO directive)</p> <p>Supply voltage: FISCO ≤17.5 V (trapezoidal or rectangular characteristic) ≤ 24 V (linear characteristic)</p> <p>Current consumption: &lt;12.7 mA</p> <p>Physical interface: according to EN 61158-2</p> <p>Max. current in case of fault (FDE): &lt;21.4 mA</p>
Explosion protection	II 2(1)G EEx ia IIC T4
Operating tool	Device description implemented in SIMATIC PDM
Ambient temperature	-20 ... +55 °C
Electromagnetic compatibility	EN 61 626 Emitted interference: Class B (residential area) Immunity to interference: Industry
Enclosure	Material: PBT Protection: IP 65 Dimensions: see dimension drawing page 119
Weight	Approx. 1 kg

1) With Pt 100: 1 K

# EC Type Examination Certificates


**Prüf- und Zertifizierungsstelle**  
**ZELM Ex**


(1) **EC-TYPE-EXAMINATION CERTIFICATE**  
(Translation)

(2) Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres - Directive 94/9/EC

(3) EC-TYPE-EXAMINATION CERTIFICATE Number  
**ZELM 99 ATEX 0016**

(4) Equipment: **Transmitter Stratos PROFIBUS 2221X pH\*\***

(5) Manufacturer: **Knick Elektronische Messtechnik GmbH & Co.**

(6) Address: **Braunschweig, D-31535**

(7) The equipment and any acceptable variation thereto are specified in the schedule to this certificate and the documents thereon referred to.

(8) The Prüf- und Zertifizierungsstelle ZELM Ex, notified body No. 0822 in accordance with Article 9 of the Council Directive 94/9/EC 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 confidential report ZELM Ex 0008914024.

(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:  
**EN 50 014: 1987      EN 50 020: 1994**

(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 and construction of the specified equipment in accordance with Directive 94/9/EC. Further requirements of this Directive apply to the manufacture and supply of this equipment.

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


**R 2 (T) G Ex ia IIC T4**

Zertifizierungsstelle ZELM Ex      Braunschweig, February 21, 2000

Dipl.-Ing. Harald Zeim



Sheet 1/4

EC type-examination Certificate without signature and stamp shall not be valid. The certificate may be consulted only without alteration. Extracts or alterations are subject to approval by the Prüf- und Zertifizierungsstelle ZELM Ex. In case of dispute, the German text shall prevail.  
Prüf- und Zertifizierungsstelle ZELM Ex - Seligenberg 18 - D-31535 Braunschweig


**Prüf- und Zertifizierungsstelle**  
**ZELM Ex**


(13) **SCHEDULE**

(14) **EC-TYPE-EXAMINATION CERTIFICATE ZELM 99 ATEX 0016**

(15) **Description of equipment**  
The Transmitter Stratos PROFIBUS 2221X pH\*\* with Profibus - PA - communication interface is primarily used for the recognition and processing of electrochemical quantities and is equipped with an input for pH-measurements and a temperature measuring input.  
The maximum permissible ambient temperature is 55 °C.

**Electrical data**

BUS - / Supply loop (terminals 13/14 and 10/15)

type of protection intrinsic Safety exp.	Ex ia IICMB Ex ia IICMB
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only for the connection to a certified intrinsically safe circuit (for example PISCO - supply unit) with the following maximum values:

	PISCO-supply unit	linear transfer
U <sub>max</sub>	12,5 V	24 V
I <sub>max</sub>	200 mA	200 mA
P <sub>max</sub>	4,8 mW	1,2 mW

effective internal capacitance: C<sub>i</sub> ≤ 1 pF  
effective internal inductance: L<sub>i</sub> ≤ 10 pF

pH-measuring loop (terminals 1, 2, 4 and 5)

type of protection intrinsic Safety exp.	Ex ia IICMB Ex ia IICMB
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maximum values:

U <sub>0</sub>	≤ 11,8 V
I <sub>0</sub>	≤ 12 mA
P <sub>0</sub>	≤ 18 mW (linear characteristics)

	IC	Ex ia	Ex ia
max. permissible external inductance	240 mH	850 mH	850 mH
max. permissible external capacitance	1,47 pF	9,9 pF	9,9 pF

(only valid if external inductance and external capacitance do not exist in concentrated form at the same time)

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**Prüf- und Zertifizierungsstelle**  
**ZELM Ex**


**SCHEDULE TO EC-TYPE-EXAMINATION CERTIFICATE ZELM 99 ATEX 0016**

	IC	Ex ia	Ex ia
max. permissible external inductance	2 mH	10 mH	10 mH
max. permissible external capacitance	452 pF	1,47 pF	1,47 pF

(only valid if external inductance and external capacitance do not exist in concentrated form at the same time)

effective internal capacitance: C<sub>i</sub> ≤ 30 pF  
The effective internal inductance is negligibly small.

Temperature measuring loop (terminals 7 and 8)

type of protection intrinsic Safety exp.	Ex ia IICMB Ex ia IICMB
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maximum values:

U <sub>0</sub>	≤ 5,8 V
I <sub>0</sub>	≤ 3,1 mA
P <sub>0</sub>	≤ 4,8 mW (linear characteristics)

	IC	Ex ia	Ex ia
max. permissible external inductance	1000 mH	1000 mH	1000 mH
max. permissible external capacitance	43 pF	1000 pF	1000 pF

(only valid if external inductance and external capacitance do not exist in concentrated form at the same time)

	IC	Ex ia	Ex ia
max. permissible external inductance	5 mH	10 mH	10 mH
max. permissible external capacitance	500 pF	1,75 pF	1,75 pF

(only valid if external inductance and external capacitance do not exist in concentrated form at the same time)

effective internal capacitance: C<sub>i</sub> ≤ 250 pF  
The effective internal inductance is negligibly small.

EP output (terminals 17, 18 and 19)


type of protection intrinsic Safety exp.	Ex ia IICMB Ex ia IICMB
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maximum values:

U <sub>0</sub>	≤ 11,8 V
I <sub>0</sub>	≤ 32,8 mA
P <sub>0</sub>	≤ 48,4 mW (linear characteristics)

Sheet 3/4

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**Prüf- und Zertifizierungsstelle**  
**ZELM Ex**


**SCHEDULE TO EC-TYPE-EXAMINATION CERTIFICATE ZELM 99 ATEX 0016**

	IC	Ex ia	Ex ia
max. permissible external inductance	34 mH	130 mH	130 mH
max. permissible external capacitance	1,47 pF	9,9 pF	9,9 pF

(only valid if external inductance and external capacitance do not exist in concentrated form at the same time)

	IC	Ex ia	Ex ia
max. permissible external inductance	2,8 mH	9 mH	9 mH
max. permissible external capacitance	424 pF	1,47 pF	1,47 pF

(only valid if external inductance and external capacitance do not exist in concentrated form at the same time)

effective internal capacitance: C<sub>i</sub> ≤ 30 pF  
The effective internal inductance is negligibly small.

EP (terminal 9 or terminal 10)

for the connection to the equipotential bonding system

References:  
Connecting the equipotential bonding is absolutely required to guarantee electrostatic leakage.  
The BUS - / Supply loop is safely electrically isolated from the other loops up to a voltage of 60 V.  
The operation manual has to be considered.

(16) Basic No. ZELM Ex 0008914024

(17) Special conditions for safe use  
not applicable

(18) Essential Health and Safety Requirements  
met by standards

Zertifizierungsstelle ZELM Ex      Braunschweig, February 21, 2000

Dipl.-Ing. Harald Zeim



Sheet 4/4

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# Certificate

