Stratos® PROFIBUS 2221 X Oxy

Standardized digital communication for the measurement of dissolved oxygen

Communicative progress

Stratos® PROFIBUS 2221 X Oxy for the measurement of dissolved oxygen offers the benefits of the proven Stratos® series – from the calibration timer to the icon-guided operation; from the automatic GainCheck® device self-test to the SensoCheck® sensor monitoring.
And it offers even more: problem-free integration into fully automatic process systems using standardized PROFIBUS communication.
The devices follow the complete PROFIBUS PA Profile for Analyzers, Version 3.0.

PROFIBUS facilitates cost reductions for new plants in comparison with conventional technology due to marked savings in materials and time. This means less expenditure – from project design and commissioning via operation and maintenance to subsequent system additions.
Together with the SE 706 and SE 707 sensors, the Stratos® PROFIBUS 2221 X Oxy is predestined for use in biotechnology, foodstuffs production, the pharmaceutical industry, water or wastewater technology as well as the chemical industry.

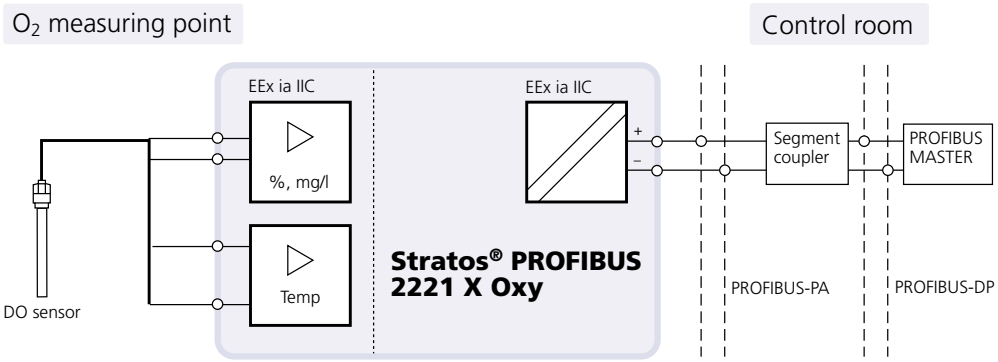
The facts

- **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 measured value display**
- **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).

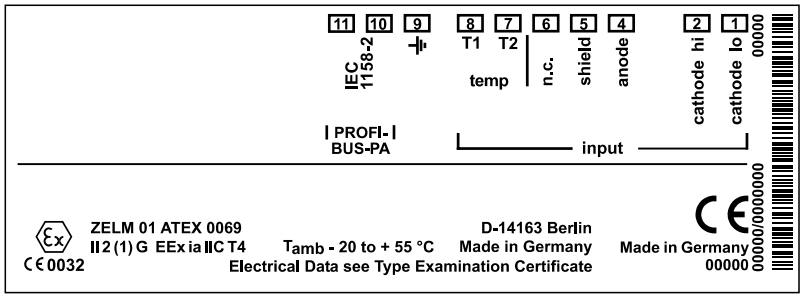
Connection



Product line

		Order No.
Stratos® PROFIBUS 2221 X Oxy	Field device for measuring dissolved oxygen; equipped for the standardized PROFIBUS PA communication.	**2221 X Oxy**
Mounting accessories	See Accessories chapter (page 121)	

Terminal assignment



Specifications

Ranges	Measuring range 1 (low level)	Measuring range 2 (high level)
Saturation*) Meas. error 1, 2, 3)	0.0 ... 120.0 % 0.5 % meas. val. +0.1 % saturation	0 ... 500 % 0.5 % meas. val. +0.5 % saturation
Concentration	0000 ... 9999 µg/l 0000 ... 9999 ppb 0.000 ... 9.999 ppm 0.000 ... 9.999 mg/l	0.0 ... 50.0 mg/l 0.0 ... 50.0 ppm
Meas. error 1, 2, 3)	0.5 % meas. val. +5 µg/l or 5 ppb	0.05% meas.val. +0.05 mg/l or 0.05 ppm
Temperature Meas. error 1, 2, 3)	–20.0 ... +150 °C < 0.5 K (< 1 K at > 100 °C)	–20.0 ... +150 °C < 0.5 K (< 1 K at > 100 °C)
Polarization voltage	0 ... 1000 mV	
Display	LC display, 7-segment Red alarm LED: Error message	Measurement display: µg/l, mg/l, ppb, ppm, %, temp Sensoface®, mode indicators, icons/symbols
Temperature input	NTC 22 kOhm or NTC 30 kOhm, adjustable	
Pressure correction	0.000 ... 9.999 bar, manual or entered via PROFIBUS	
Sensocheck®	Monitoring for short circuits or open circuits	
Sensor standardization	– Zero point calibration – Product calibration	– Calibration with input of O_2 saturation – Calibration with input of O_2 concentration
Calibration timer	0 ... 9999 h	
Limit values 1, 2	Cyclical, discrete signal (DI) via PROFIBUS, user-defined for the process variables: Saturation, concentration, temperature	
Communication interface	Protocol: PROFIBUS PA via segment coupler or link to SPC, PC, PLC Profile: Profile for Analyzers Version 3.0 (PNO directive) Supply voltage: FISCO ≤ 17.5 V (trapezoidal or rectangular characteristic) ≤ 24 V (linear characteristic) Current consumption < 13.3 mA Physical interface EN 61158-2 Max. current in case of fault (FDE) < 17.6 mA	
Operating tool	Device description implemented in SIMATIC PDM	
Explosion protection	II 2(1)G EEx ia IIC T4	
Ambient conditions	Operating and ambient temperature Transport and storage temperature	–20 ... +55 °C –20 ... +70 °C
Electromagnetic compatibility	EN 61 626 Emitted interference: Class B (residential area) Immunity to interference: Industry	
Enclosure	Material: PBT; protection: IP 65; dimensions: 144 x 144 x 105 mm (w x h x d)	
Weight	Approx. 1 kg	

*) –10 ... +80 °C
1) According to IEC 746 Part 1, at nominal operating conditions
2) ±1 count
3) Plus sensor error

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 01 ATEX 0069

(4) Equipment: Transmitter Stratos PROFIBUS 2221 X Oxy

(5) Manufacturer: Knick Elektronische Meßgeräte GmbH & Co.

(6) Address: D - 14163 Berlin, Beuckestraße 22

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

(8) The Prüf- und Zertifizierungsstelle ZELM Ex, notified body No. 0820 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 02901/2097.

(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN 50 014: 1997+A1+A2 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:

Ex II 2 (1) G EEx ia IIC T4

Zertifizierungsstelle ZELM Ex Braunschweig, November 21, 2001

Dipl.-Ing. Hansjörg Zehm

Sheet 1/3

EC-type-examination Certificates without signature and stamp are not valid. The certificate may only be circulated 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 - Stadtgraben 9A - D-38114 Braunschweig

Prüf- und Zertifizierungsstelle
ZELM Ex

(13) SCHEDULE

(14) EC-TYPE-EXAMINATION CERTIFICATE ZELM 01 ATEX 0069

(15) Description of equipment

The Transmitter Stratos PROFIBUS 2221 X Oxy with Profibus – PA – communication interface is preferably used for the recognition and processing of electrochemical quantities and is equipped with an input for measurements of the oxygen partial pressure and a temperature measuring input.

The maximum permissible ambient temperature is 55 °C.

Electrical data

BUS- / Supply loop (terminals 11 and 10)
type of protection Intrinsic Safety EEx ia IIC/IIB
resp. EEx ib IIC/IIB

for the connection to a certified intrinsically safe circuit only (for example FISCO – supply unit) with the following maximum values:

	FISCO- supply unit	linear barrier
U_{max}	17.5 V	24 V
I_{max}	380 mA	300 mA
P_{max}	4.9 W	1.2 W

effective internal capacitance: $C_i \leq 1$ nF
effective internal inductance: $L_i \leq 10$ µH

Oxygen measuring loop (terminals 1(2), 4 and 5)
type of protection Intrinsic Safety EEx ia IIC/IIB
resp. EEx ib IIC/IIB

maximum values: $U_o = 10$ V, $I_o = 11$ mA, $P_o = 14$ mW, R = 475 Ω (linear characteristics)

	IIC	resp.	IIB
max. permissible external inductance	1 mH		5 mH
max. permissible external capacitance	625 nF		4 µF

effective internal capacitance: $C_i \leq 25$ nF
The effective internal inductance is negligibly small.

Sheet 2/3

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Prüf- und Zertifizierungsstelle ZELM Ex - Stadtgraben 9A - D-38114 Braunschweig

Prüf- und Zertifizierungsstelle
ZELM Ex

SCHEDULE TO EC-TYPE-EXAMINATION CERTIFICATE ZELM 01 ATEX 0069

Temperature measuring loop (terminals 7 and 6)
type of protection Intrinsic Safety EEx ia IIC/IIB
resp. EEx ib IIC/IIB

maximum values: $U_o = 5$ V, $I_o = 1$ mA, $P_o = 2$ mW, R = 7,88 kΩ (linear characteristics)

	IIC	resp.	IIB
max. permissible external inductance	1 mH		5 mH
max. permissible external capacitance	4 µF		10 µF

effective internal capacitance: $C_i \leq 120$ nF
The effective internal inductance is negligibly small.

EP (terminal 9)
for the connection to the equipotential bonding system

References:
Connecting the equipotential bonding is absolutely required to guarantee electrostatical leakage.

The BUS- / Supply loop is safety electrically isolated from the other loops up to a peak value of the nominal voltage of 60 Volts.

The operation manual has to be considered.

(16) Report No. ZELM Ex 02901/2097

(17) Special conditions for safe use
not applicable

(18) Essential Health and Safety Requirements
met by standards

Zertifizierungsstelle ZELM Ex Braunschweig, November 21, 2001

Dipl.-Ing. Hansjörg Zehm

Sheet 3/3

EC-type-examination Certificates without signature and stamp are not valid. The certificate may only be circulated 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 - Stadtgraben 9A - D-38114 Braunschweig

Certificate

Certificate

PROFIBUS Nutzerorganisation e.V. grants to

Knick Elektronische Meßgeräte GmbH & Co
Beuckestr. 22, D-14163 Berlin
the Certificate No.: **Z00782** for the following product:

Name: **Stratos 2221X Oxy**
Model: **Dissolved Oxygen Meter**
Revision: **Version 1.0; Stack: 1.3 (09.12.98); SW: Version 2.0**
GSD: **KN0C7533.gsd**
PA139750.gsd

This certificate confirms that the device has successfully passed the conformance tests for PROFIBUS-DP Slave devices. Furthermore, the device fulfills the requirements of the PROFIBUS-PA Profile for Process Control Devices, Version 3.0.

The tests were executed in accordance with "Test Specifications for Field Devices in accordance with PROFIBUS PA Profile for Process Control Devices Version 3.0" of April 2000 at ifak in Magdeburg which is an authorized test laboratory of PROFIBUS Nutzerorganisation. The detailed test procedure and the test results are recorded in the inspection report 044-01.

This certificate is granted according to the PNO guideline for testing and certification (PRZ) dated August 1, 1999 and is valid for 3 years, i.e. until September 26, 2005.

Karlsruhe, November 20, 2002

(Official in Charge)

Board of PROFIBUS Nutzerorganisation e. V.

(K.-P. Lissner) (Prof. K. Bender)