

Advance Optima Continuous Gas Analyzers

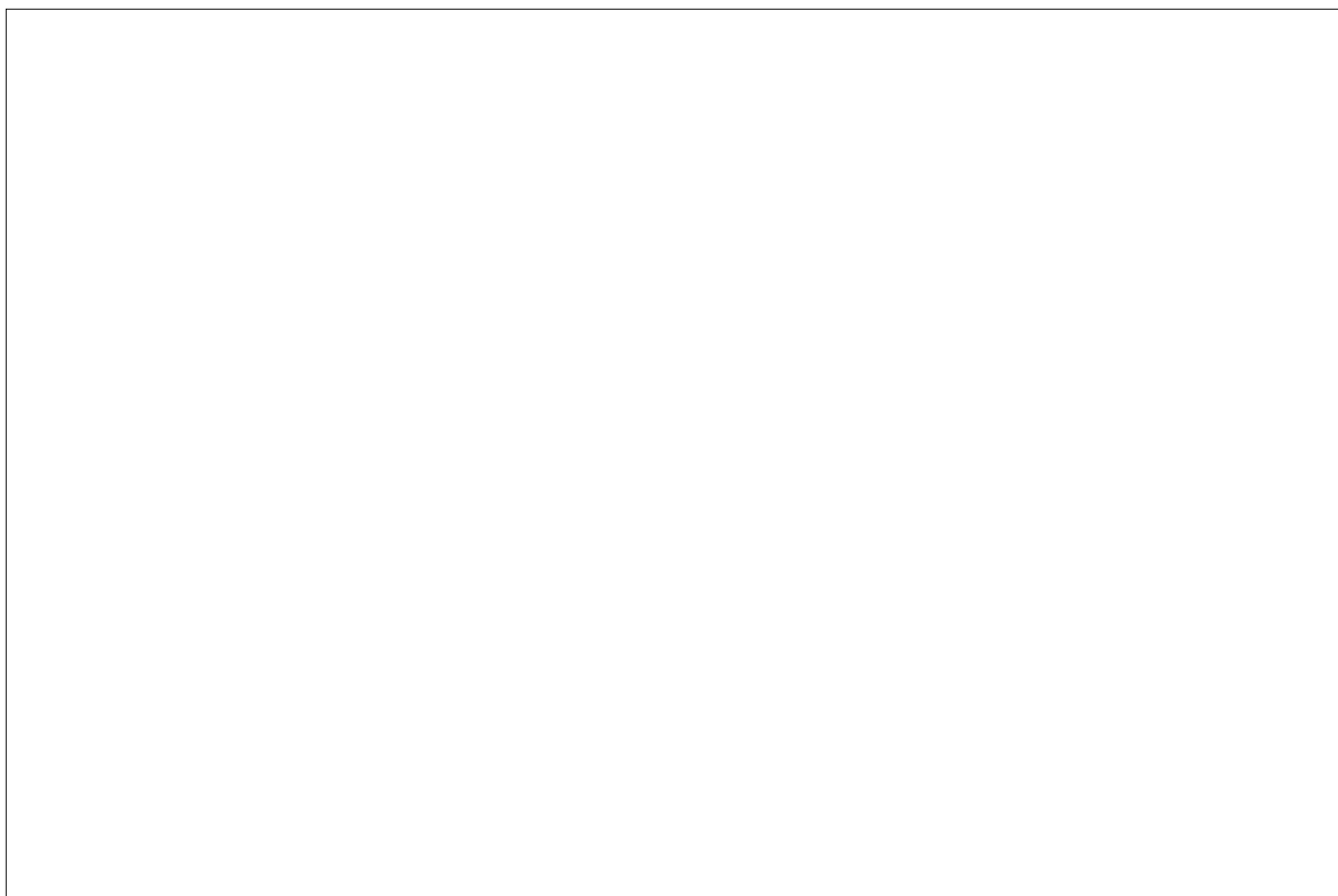
AO2000 Series with Uras26, Magnos206, Caldos25, Caldos27

Designed per Category 3G for Measurement of

Flammable Gases (“Safety Concept”) and Non-flammable Gases

Supplementary Operator’s Manual

42/24-14 EN Rev. 3



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Preliminary Remarks

Content of the Supplementary Operator's Manual

This operator's manual for the Advance Optima AO2000 Series Gas Analyzers with Uras26, Magnos206, Caldos25, Caldos27 in Category 3G for measurement of flammable gases ("safety concept") and non-flammable gases is a supplement to the operator's manual for the Advance Optima AO2000 Series Continuous Gas Analyzers.

It should always be used in conjunction with the primary operator's manual and contains all additional information necessary for the safe installation, start-up and operation of the gas analyzers in compliance with applicable regulations.

Note the information on the "Analyzer Data Sheet" shipped with every gas analyzer.



The Advance Optima AO2000 Series Gas Analyzer with Limas11 in Category 3G is described in the supplementary operator's manual with the document number 42/24-14 EN Rev. 2.

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Description

“Safety Concept” Gas Analyzers

The “Safety Concept” gas analyzers include the analyzer modules

- Uras26 in the version with safety cell and purged sample cell windows,
- Caldos25, Caldos27, Magnos206 in the versions with direct connection of the sample chamber and purged thermostat chamber,

each installed in the 19-inch rack-mount housing (Model AO2020) or wall-mount housing (Model AO2040).

Monitoring of the purge gas flow rate is a feature of the “Safety Concept”. It is fully integrated into the gas analyzer, together with the controls and signal processing.

Intended Use

These gas analyzers are suited and intended for measurement of gas concentrations in

- non-flammable gases and vapors,
- flammable gases and vapors belonging to Group IIC and Temperature Class T4 that form explosive atmospheres rarely and then only briefly (Zone 2).

The temperature class of the gas analyzer is T4.

The measurement function of the gas analyzer has not been tested to be suited for interaction with other devices in explosion hazard areas.

Note: A non-flammable gas is a gas mixture the flammable content of which is always – even in the event of a fault – below the lower explosive limit (LEL).

Construction

The gas analyzer consists of:

- the central unit (housing with display and controls, power supply and electronics module) and
- the analyzer module.

The analyzer module is installed either in the housing containing the central unit or in a separate housing.

Construction complies with the specifications contained in Directive 94/9/EG (ATEX Directive). The analyzers also comply with EN 60079-15 and EN 60079-2.

Identification

In compliance with Directive 94/9/EG 

In compliance with EN 60079-15 Ex nA py II T4

Type Examination Certificate

BVS 07 ATEX E 013 X

Internal and External Explosion Protection

No Release of Flammable Sample Gas

The following measures reliably prevent the release of flammable sample gas from the sample gas path (containment system) into the analyzer housing:

- The sample gas paths in the analyzer modules are designed to be gas-tight, constructed of metal tubing and tested to be free of leaks.
- The sample cell in the analyzer module Uras26 (except for the windows and the seals) is designed to be fail-safe. Interconnecting tubing and the sample cell are metal and welded together, with no additional fittings prior to leaving the analyzer housing.
- A curtain of inert gas encloses all non-fail-safe portions of the sample gas path, e.g. windows and seals. The design utilizes pressurized enclosure type “py”. When operated in accordance with the “Technical Data” (see page 5), the purge gas pressure lies at least 0.5 hPa above the sample gas pressure. In this way, the sample gas path fulfills the basic requirements for “no release” as specified in IEC 60079-2, Section 11.1.
- At suitable time intervals, the sample gas pressure and functionality of the simplified pressurized enclosure are tested.
- At suitable time intervals, the sample gas path and purge gas path are tested for leaks.

Note: In this operator's manual, “purge gas” is used in terms of “ignition suppression gas” according to EN 60079-2.

No Electrical Ignition Sources in the Analyzer Housing

The electrical components inside the analyzer housing are non-sparking assemblies and components or “sealed devices” as per EN 60079-15, so that no electrical ignition sources are present in the analyzer housing during normal operation.

If sample gas is released in spite of the measures described above and a dangerous explosive atmosphere forms briefly inside the analyzer housing, explosion protection is nevertheless assured.

No Ignition Source in the Sample Gas Path

There are no ignition sources in the sample gas path during normal operation.

External Explosion Protection

Only non-hot assemblies and components are located inside the analyzer housing.

Technical Data

Electrical Data	Power supply	<ul style="list-style-type: none"> Analyzer housing with central unit and analyzer module: 100 to 240 V AC (– 15 %, + 10 %), 2.2 to 0.7 A, 47 to 63 Hz Analyzer housing with 2 analyzer modules: 24 V DC, max. 80 W per module, Operating low voltage with secure isolation “PELV”
	Signal inputs and outputs	Operating low voltage with secure isolation “PELV”
	System bus, computer interfaces	Operating low voltage with secure isolation “PELV”
	Refer to Data Sheet “Advance Optima AO2000 Series” for additional electrical data.	
Analyzer Housing	Degree of protection	IP54 as per EN 60529
Ambient Temperature		Ambient temperature during operation with analyzer module installed in the analyzer housing
		without electronics module with electronics module
	Uras26	+5 to +45°C +5 to +40 °C
	Caldos25	+5 to +45 °C +5 to +45 °C
	Caldos27	+5 to +50 °C +5 to +45 °C
	Magnos206	+5 to +50 °C +5 to +45 °C
Sample Gas Path (Containment System)	Sample gas	<ul style="list-style-type: none"> Flammable and non-flammable gases and vapors <ul style="list-style-type: none"> under atmospheric conditions ($p_{abs} \leq 1.1$ bar, oxygen content ≤ 21 Vol.-%), Sample gas Temperature Class T4, not potentially explosive under normal conditions, if potentially explosive in the event of a fault, then only seldom and briefly (in accordance with Zone 2). Mixtures of flammable gases and vapors and oxygen that are not explosive under normal conditions or in the event of a fault. As a rule, these can be achieved if the oxygen content is reliably limited to max. 2 Vol.% or the flammable component is reliably limited to max. 50 % LEL. Flammable gases and vapors that are explosive under the conditions encountered during analysis, even when oxygen is excluded, may be present in the mixture to be analyzed only in concentrations that are considered non-critical according to safety regulations.

Continued on next page

Sample Gas Path (Containment System)	Flow rate	max. 40 l/h	
	Pressure	at sample gas inlet:	max. 3 hPa positive pressure
		at sample gas outlet:	atmospheric
	Sample gas supply cutoff	by the operator <ul style="list-style-type: none"> • When shutting down the gas analyzer • In the event of an alarm (failure of the pressurized enclosure) in accordance with section “Additional special conditions during operation with a flammable sample gas”, see page 7 	
Inert Gas Curtain/ Purge Gas/ Pressurized Enclosure	Identification of gas connections	Purge gas inlet:	“Analyzer Purge In”
		Purge gas outlet:	“Analyzer Purge Out”
	Purge gas	Inert gas (N ₂)	
	Flow rate	during operation:	15 to 20 l/h
		during initial purge:	15 to 40 l/h
	Initial purge	manually controlled; initial purge duration:	
		Uras26:	1.6 minutes at min. 15 l/h
	Caldos25, Caldos27 and Magnos206:	18 minutes at min. 15 l/h or 6.8 minutes at min. 40 l/h	
	An initial purge is not necessary if it has been verified that no flammable sample gas is present in the sample gas path or in the purge gas path.		
Operation	A capillary located in the purge gas path monitors that the required positive pressure of the purge curtain is ≥ 0.5 hPa above that of the sample gas at the above-specified purge gas flow rates.		
Monitoring	<ul style="list-style-type: none"> • The above-specified purge gas flow rates are monitored in the gas analyzer. • Alarm signal at digital output in accordance with data listed in the “Analyzer Data Sheet”. • Alarm signal in the event that the <ul style="list-style-type: none"> • Flow rate drops below a minimum value of 15 l/h (corresponds to approx. 7 hPa) • Flow rate exceeds a maximum value of 40 l/h (corresponds to approx. 50 hPa) 		

Special Conditions During Operation

Special Conditions

- All cables must enter via the specified cable fittings and be sealed by tightening the nuts in accordance with IP 54. Unused cable fittings must be closed off with plugs.
- If the gas analyzer is installed in a location subject to explosion hazard,
 - the external “Power supply 24 V DC” and “System bus” connectors on the analyzer module, which are accessible without opening the housing, may not be plugged in or unplugged while the power is on.
 - the analyzer housing may not be opened while the power is on.

Additional Special Conditions During Operation With a Flammable Sample Gas

- The sample gas pressure inside the gas analyzer must correspond to atmospheric values under all operating and fault conditions (positive pressure ≤ 3 hPa).
- If the pressurized enclosure (supply of inert gas to the purge curtain) fails and an alarm is triggered, the fault must be corrected quickly. The gas analyzer can remain in operation. If the fault cannot be eliminated quickly, supply of the sample gas must be cut off.
- When the gas analyzer is not in operation, the sample gas supply must be cut off.
- Tests:
 - At start-up of the analyzer, after failure of the pressurized enclosure and at regular time intervals, a test for proper functioning of the pressurized enclosure must be conducted by a technically competent person. At this time, the conditions stipulated in the section “Technical Data” (see page 5) should be checked and established.
 - The alarm output must be checked.
 - The integrity (i.e. absence of leaks) of the sample gas path and purge gas path must be checked in regular intervals.
- If the gas analyzer contains several analyzer modules, the pressurized enclosure must be installed as well as monitored and checked separately for each individual analyzer module. In the event of a fault, an alarm must be triggered in each individual analyzer module.



The pressurized enclosure (supply of inert gas to the purge curtain) must be provided separately from the housing purge where applicable.



The pressurized enclosure function is not required when the gas analyzer is used to measure non-flammable gases.

Purging the Thermostat Chamber

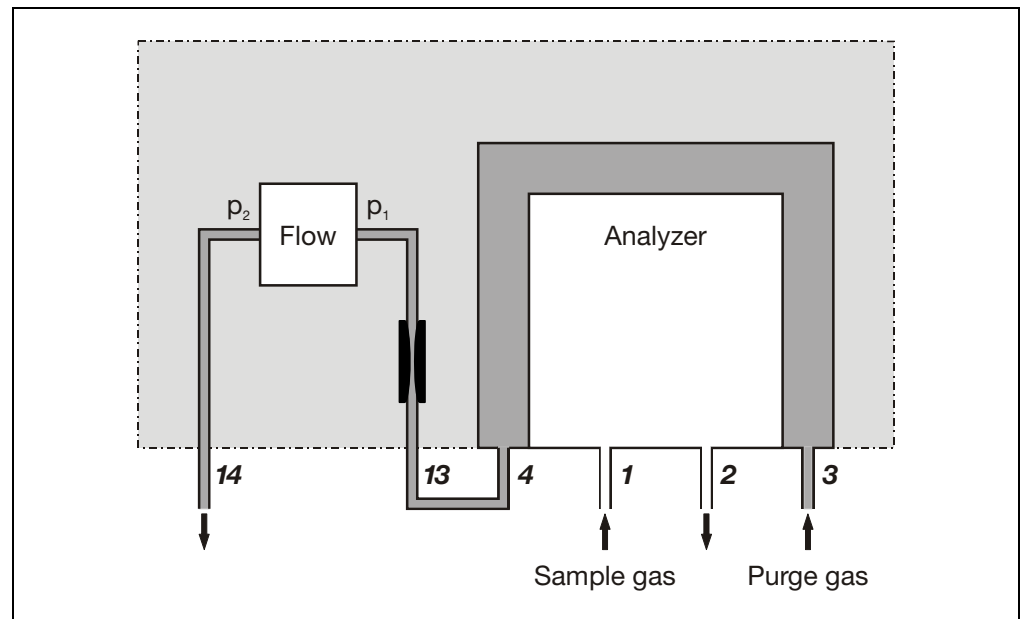
(see Fig. 1)

The thermostat chamber that encloses the actual analyzer is flushed with purge gas at a slight positive pressure. The curtain of inert gas formed in this manner encapsulates all portions of the sample gas path. In the event of a leak in the sample gas path, the purge gas flows into the analyzer and, in this way, prevents flammable gases from emerging from the analyzer module.

The purge gas is introduced into the thermostat chamber at a flow rate of 15 to 20 l/h and a positive pressure of $p_e \leq 50$ hPa. As a result of the capillary, a positive pressure of $p_e = 7$ to 20 hPa is established. The purge gas flow rate is measured by a flow sensor located downstream from the capillary in the sample gas path. The outlet of the flow sensor is open to atmospheric pressure.

The signal from the flow sensor is monitored and evaluated by a function block application (see section “Monitoring the purge gas flow rate”, page 12).

Fig. 1
Purge Curtain in Caldos25, Caldos27, Magnos206



- 3** Purge gas inlet thermostat chamber “Analyzer Purge In”
- 4** Purge gas outlet thermostat chamber, connected at the factory to the
- 13** Purge gas inlet flow rate monitor
- 14** Purge gas outlet flow rate monitor “Analyzer Purge Out”
- 1** Sample gas inlet
- 2** Sample gas outlet

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Fig. 2
Gas Connections
Caldos25, Caldos27

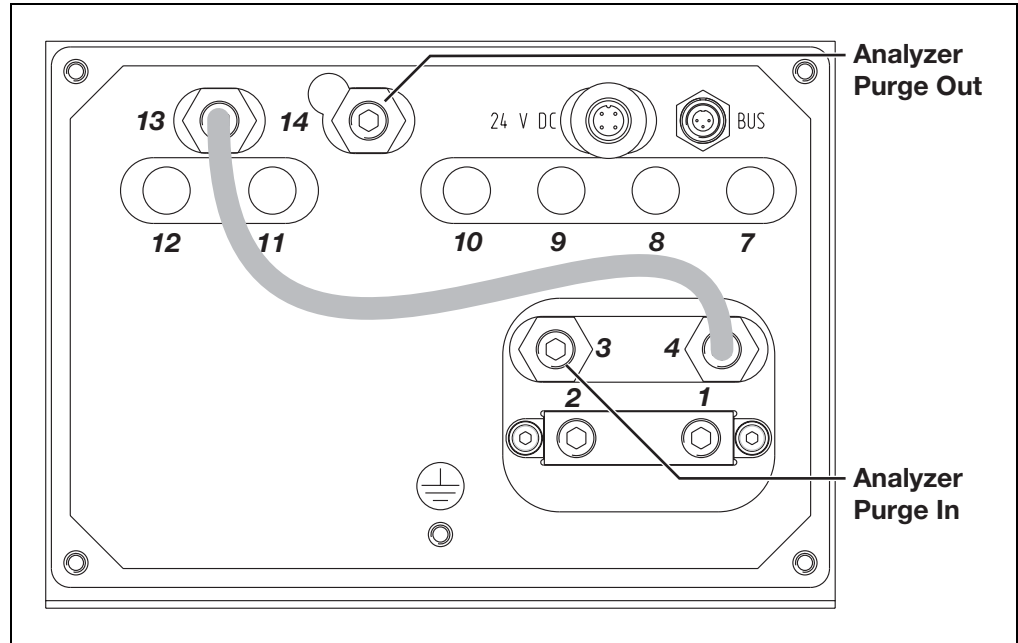
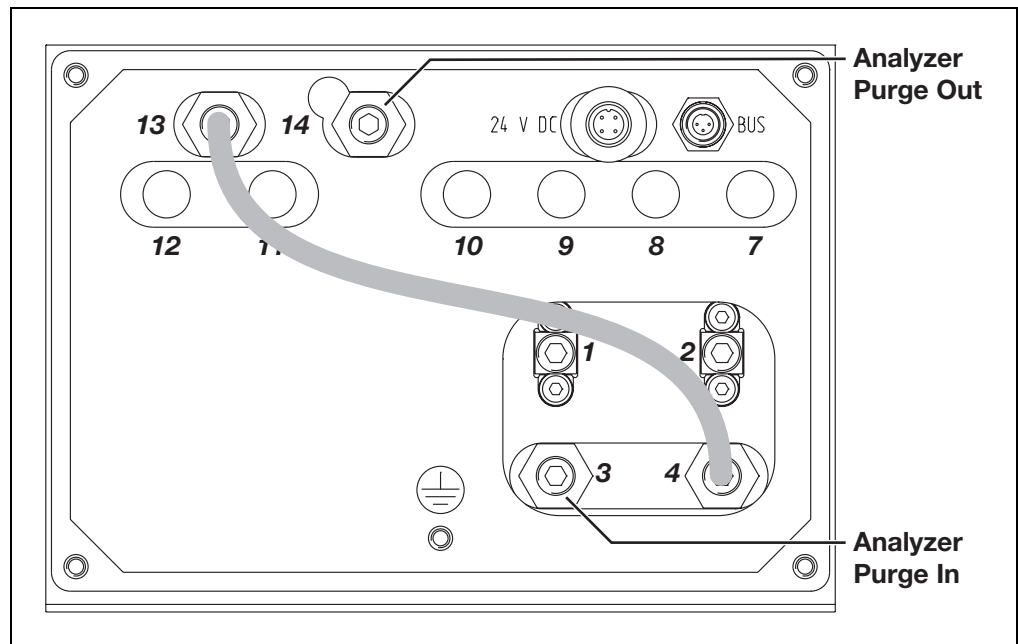


Fig. 3
Gas Connections
Magnos206



- 3** Purge gas inlet thermostat chamber **“Analyzer Purge In”**
 Install needle valve upstream to adjust purge gas flow rate to 15 to 20 l/h
 - 4** Purge gas outlet thermostat chamber, connected at the factory to the **13** Purge gas inlet flow rate monitor
 - 14** Purge gas outlet flow rate monitor **“Analyzer Purge Out”**
- | | |
|-----------------------------------|----------------------------|
| 1 Sample gas inlet | 9 Pressure sensor |
| 2 Sample gas outlet | 10 Pressure sensor |
| 7 Housing purge gas outlet | 11 not used, sealed |
| 8 Housing purge gas inlet | 12 not used, sealed |

Purging the Sample Cell Windows

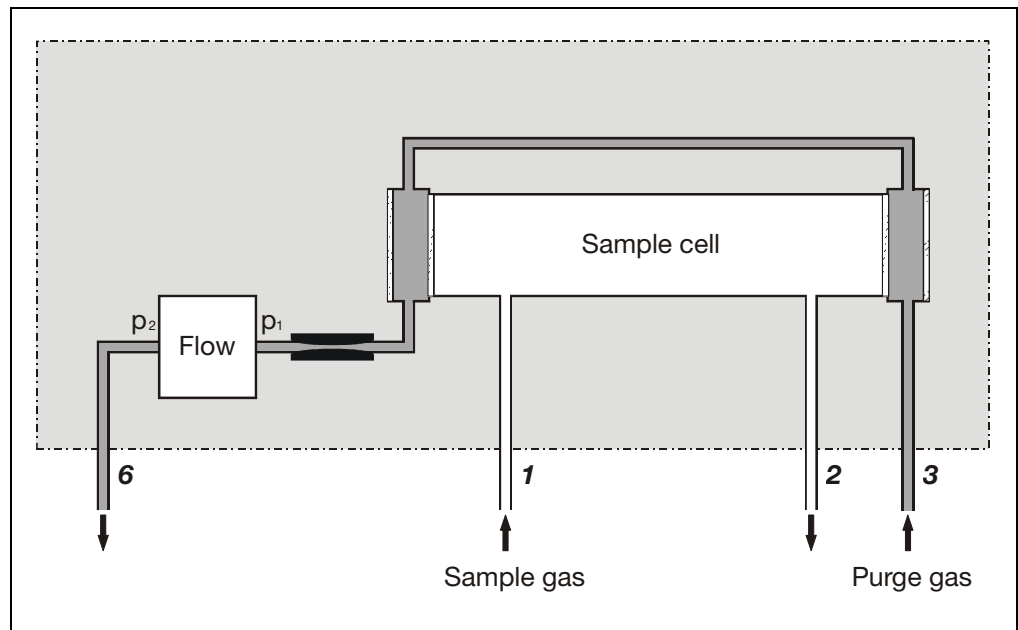
(see Fig. 4)

Purge gas at a slight positive pressure flows through the sample cell windows of the safety cell. In the event of a leak in the sample gas path, e.g. cracking of the sample cell window, the purge gas flows into the sample cell and, in this way, prevents flammable gases from emerging from the analyzer module.

The purge gas is introduced to the purge curtain at a flow rate of 15 to 20 l/h and a slight positive pressure of $p_e \leq 50$ hPa. As a result of the capillary, a positive pressure of $p_e = 7$ to 20 hPa is established. The purge gas flow rate is measured by a flow sensor located downstream from the capillary in the sample gas path. The outlet of the flow sensor is open to atmospheric pressure.

The signal from the flow sensor is monitored and evaluated by a function block application (see section "Monitoring the purge gas flow rate", page 12).

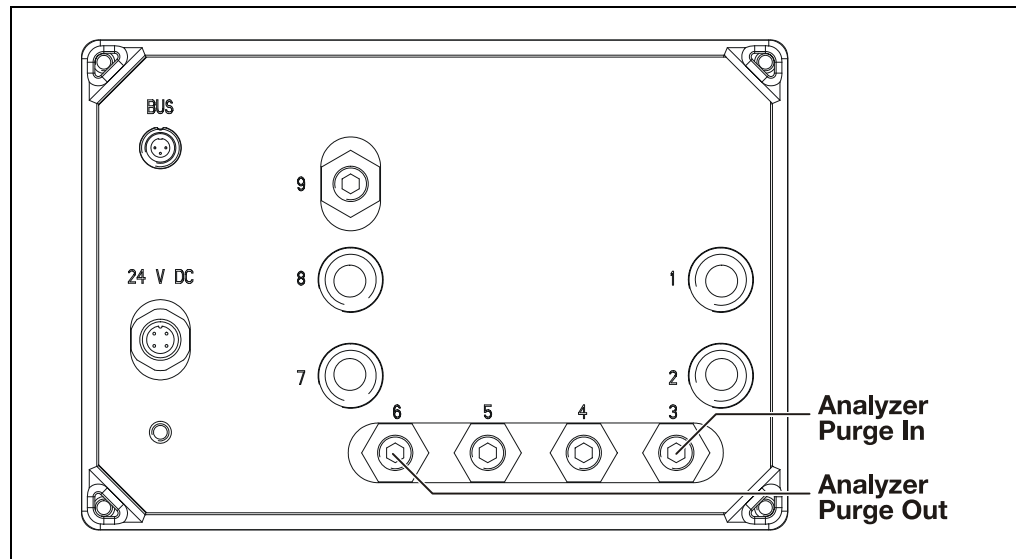
Fig. 4
Purge Curtain in Uras26



- 3** Purge gas inlet sample cell windows "**Analyzer Purge In**"
- 6** Purge gas outlet flow rate monitor "**Analyzer Purge Out**"
- 1** Sample gas inlet
- 2** Sample gas outlet

Continued on next page

Fig. 5
Gas Connections
Uras26



- 3** Purge gas inlet sample cell windows “**Analyzer Purge In**”
 Install needle valve upstream to adjust purge gas flow rate to 15 to 20 l/h
- 6** Purge gas outlet flow rate monitor “**Analyzer Purge Out**”
- 1** Sample gas inlet beam path 1
- 2** Sample gas outlet beam path 1
- 8** Sample gas inlet beam path 2
- 7** Sample gas outlet beam path 2
- 4** Housing purge gas inlet
- 5** Housing purge gas outlet
- 9** Pressure sensor (Option)

Monitoring the Purge Gas Flow Rate

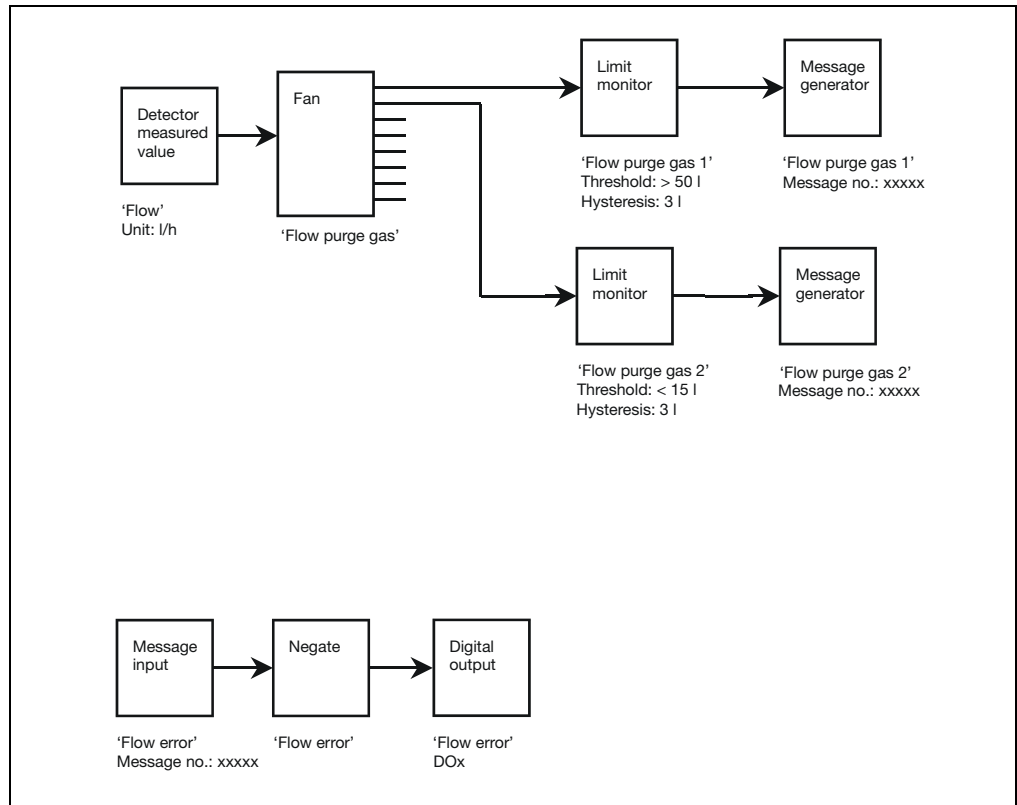
Monitoring the Purge Gas Flow Rate

The purge gas flow rate is monitored continuously by a flow sensor. The signal from the flow sensor is monitored and evaluated by the function block application shown in Fig. 6. This function block application is configured at the factory. Separate monitoring and evaluation are provided for each analyzer module.

Output of the Status Signal

In the event of a flow rate fault in the purge gas path, a status signal is generated at a digital output (see “Analyzer Data Sheet”). The user must wire this status signal so as to trigger an audible or visual alarm.

Fig. 6
Function Block Application for Monitoring the Purge Gas Flow Rate





Konformitätserklärung Declaration of Conformity



ABB Automation GmbH
60488 Frankfurt am Main
Germany

erklärt, dass das Produkt
declares that the product

Geräteart: **Kontinuierliche Gasanalytoren**
Device: *Continuous Gas Analyzers*

Typbezeichnung: **AO2000 Serie**
Type: *AO2000 Series*

Produktnummer: **siehe Anhänge 1, 4 und 5**
Product No.: *see Annexes 1, 4 and 5*

mit den Vorschriften folgender Europäischer Richtlinien übereinstimmt:
complies with the requirements of the European Directives:

EG-Richtlinie 89/336/EWG **EMV**
EC Directive 89/336/ECC *EMC*

EG-Richtlinie 73/23/EWG **Niederspannung**
EC Directive 73/23/ECC *Low Voltage*

Weitere Angaben über die Einhaltung dieser Richtlinien enthalten die Anhänge 2 und 3.
Further information about compliance with the Directives is given in the Annexes 2 and 3

EG-Richtlinie 94/9/EG **Geräte und Schutzsysteme zur bestimmungsgemäßen Verwendung
in explosionsgefährdeten Bereichen**
EC-Directive 94/9/EC *Equipment and protective systems intended for use in potentially explosive atmospheres*

Nur für Ausführungen gemäß Anhängen 4 und 5.
Only for instruments according to Annexes 4 and 5

ABB Automation GmbH

Frankfurt, 19. März 2007

(Leiter Qualitätssicherung)
(Head of Quality Management)

(Leiter Entwicklung)
(Head of Development)

Die Anhänge sind Bestandteil dieser Erklärung.
Annexes are part of this declaration.

Diese Erklärung bescheinigt die Übereinstimmung mit den genannten Richtlinien, beinhaltet jedoch keine
Zusicherung von Eigenschaften im rechtlichen Sinne.

This declaration certifies conformance with the above mentioned Directives. Affirmation of attributes in a legal sense is not included.

Die Sicherheitshinweise in der mitgelieferten Produktdokumentation sind zu beachten.
Safety notes given in the product documentation have to be observed.



Anhang 1 zur Konformitätserklärung (Produktnummern)

Annex 1 of declaration of conformity (product no.)

Geräteart: **Kontinuierliche Gasanalysatoren**
Device: Continuous Gas Analyzers

Typbezeichnung: **AO2000 Serie**
Type: AO2000 Series

Produkt-Nr.: <i>Product No.:</i>	Modul	Produktnummern
	AO2000	24031-0-000000000000 24041-200000000000
	Gehäuse <i>Housing</i>	24311-0-000000000000 24341-200000000000
	Elektronikmodul <i>Electronic Module</i>	24411-0-500000000000 24441-200000000000
	Pneumatikmodul mit O ₂ -Sensor <i>Pneumatic Module with O₂ Sensor</i>	24171-0-000000000000 24141-200000000000
	IR-Analysatormodul Uras26 <i>IR Analyzer Module</i>	24541-200000000000
	WL-Analysatormodul Caldos25 <i>TC Analyzer Module</i>	24741-200000000000
	WL-Analysatormodul Caldos27 <i>TC Analyzer Module</i>	24742-200000000000
	O ₂ -Analysatormodul Magnos206 <i>Oxygen Analyzer Module</i>	24641-200000000000
	O ₂ -Analysatormodul Magnos27 <i>Oxygen Analyzer Module</i>	24642-200000000000
	O ₂ -Spuren-Analysatormodul ZO23 <i>Trace Oxygen Analyzer Module</i>	24242-200000000000

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Anhang 2 zur Konformitätserklärung (EMV)

Annex 2 of declaration of conformity (emc)

Geräteart: **Kontinuierliche Gasanalysatoren**
 Device: **Continuous Gas Analyzers**

Typbezeichnung: **AO2000 Serie**
 Type: **AO2000 Series**

Produkt-Nr.: siehe Anhang 1
 Product No.: *see Annex 1*

Die Übereinstimmung des bezeichneten Produktes mit den Anforderungen der Richtlinie 89/336/EWG wird nachgewiesen durch die vollständige Einhaltung der folgenden harmonisierten Europäischen Normen:
Conformance of the product with Directive 89/336/ECC is given according to the following harmonized European standards:

Störfestigkeit:	EN 61326-1	1997
<i>Electromagnetic Susceptibility:</i>	EN 61326/A1+A2	A1:1998, A2:2001
Störaussendung:	EN 61326-1	1997
<i>Electromagnetic Disturbances:</i>	EN 61326/A1+A2	A1:1998, A2:2001
	EN 61000-3-2	1998 + A14:2000
	EN 61000-3-3	1995

Prüfergebnisse:
Test results:

Festigkeit gegen elektromagnetische Störungen <i>Electromagnetic Susceptibility</i>	Norm <i>Standard</i>	Prüfschärfe* Industrieller Bereich <i>Test level industrial environment</i>
Entladung statischer Elektrizität <i>Electrostatic Discharge</i>	EN 61000-4-2	Kontakt / Luft 4 kV / 8 kV
Burst auf AC Versorgung <i>on AC mains supply</i> auf Signalleitungen <i>on signal lines</i>	EN 61000-4-4	2 kV 1 kV
Gestrahltes HF-Feld <i>radiated electromagnetic field</i>	EN 61000-4-3	10 V/m
Leitungsgeführte HF-Störungen <i>conducted high frequency disturbances</i>	EN 61000-4-6	10 V
Spannungsunterbrechung AC-Versorgung <i>voltage interruption AC mains supply</i>	EN 61000-4-11	0,5 Periode / 100 %
Surge auf AC Versorgung <i>on AC mains supply</i> auf Signalleitungen <i>on signal lines</i>	EN 61000-4-5	2 kV 1 kV
Störaussendung <i>Electromagnetic Disturbances</i>	Norm <i>Standard</i>	Prüfergebnisse <i>Test Results</i>
Störfeldstärke <i>radiated interference field strength</i>	EN 61326-1 EN 61326/A1	Klasse B / Class B
Störspannungen auf AC-Versorgung <i>on AC mains supply</i>	EN 61326-1 EN 61326/A1	Klasse B / Class B
Oberschwingströme <i>harmonic current</i>	EN 61000-3-2	Klasse A / Class A
Spannungsschwankungen, Flicker <i>Voltage change, flicker</i>	EN 61000-3-3	eingehalten

* Erfüllt mind. Bewertung „kontinuierlicher überwachter Betrieb“ nach Tabelle 2 der EN 61326-1
Performance criteria "continuous checked working" acc. Table 2 of EN 61326-1

Registrier-Nr. CT001/07

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Ausgabe/Edition 1

Continued on next page



Anhang 3 zur Konformitätserklärung (Niederspannungsrichtlinie)

Annex 3 of declaration of conformity (low voltage directive)

Geräteart: **Kontinuierliche Gasanalysatoren**
 Device: **Continuous Gas Analyzers**

Typbezeichnung: **AO2000 Serie**
 Type: **AO2000 Series**

Produkt-Nr.: siehe Anhang 1
 Product No.: *see Annex 1*

Die Übereinstimmung des bezeichneten Produktes mit den Anforderungen der Richtlinie 73/23/EWG wird nachgewiesen durch die vollständige Einhaltung der folgenden harmonisierten Europäischen Normen:
Conformance of the product with the requirements of Directive 73/23/ECC is approved by compliance with the following harmonized European standards:

EN 61010-1: 2001 Sicherheitsbestimmungen für elektrische Mess-, Steuer-, Regel- und Laborgeräte
Safety Requirements for electrical equipment for measurement, control, and laboratory use

Prüfergebnisse:
Test results:

	Im Gehäuse mit internem Netzteil <i>Enclosure with internal power supply</i>	Im Gehäuse ohne internes Netzteil <i>Enclosure without internal power supply</i>
Gerät der Schutzklasse <i>Equipment class</i>	I	III
Überspannungskategorie <i>Installation category</i>		
Netzgang <i>mains circuit</i>	III	
übrige Stromkreise <i>other circuits</i>	II	II
Verschmutzungsgrad <i>Pollution degree</i>	2	2
Prüfspannungen <i>Test voltages</i>		
Netzkreise gegen Sekundärkreise <i>Mains circuits to secondary circuits</i>	3,7 kV; 50 Hz, 1 min	
Netzkreise gegen Schutzterde <i>Mains circuits to protective earth</i>	2,2 kV; 50 Hz, 1 min	

Luft- und Kriechstrecken zwischen den berührungsgefährlichen Netzkreisen und den übrigen nicht berührungsgefährlichen Stromkreisen entsprechen den Anforderungen der verstärkten oder doppelten Isolierung (sichere elektrische Trennung).

Clearance and creepage distance between hazardous life mains circuits and non hazardous life other circuits are comply with requirements reinforced or double insulation (safe electrical separation).

Die „übrigen Stromkreise“ sind PELV-Stromkreise (Funktionskleinspannung mit sicherer Trennung).

The other circuits are PELV circuits (Protected extra low voltage with safe separation).

Continued on next page



Anhang 5 zur Konformitätserklärung (Produktnummern)

Annex 5 of declaration of conformity (product no.)

Geräteart: **Kontinuierliche Gasanalysatoren AO2000 Serie in Kategorie 3G für brennbare und nichtbrennbare Messgase**
 Device: **Continuous Gas Analyzers AO2000 Series in Category 3G for Flammable and Non-flammable Sample Gases**

Typbezeichnung: **AO2000 Serie**
 Type: **AO2000 Series**

Die kontinuierlichen Gasanalysatoren Typ AO2000 Serie dienen zur Messung einzelner Komponenten von brennbaren und nichtbrennbaren Gasgemischen.
The continuous gas analyzers type AO2000 series are used for the measurement of individual components of flammable and non-flammable gas mixtures.

Baumusterprüfbescheinigung: BVS 07 ATEX E 013 X
 Type Examination Certificate:

Benannte Stelle: Exam BBG Prüf- und Zertifizier GmbH
 Notified Body: D-45307 Essen

Geräte-Kennzeichnung: II 3G Ex nA py T4 X
 Apparatus Code:

Angewandte Normen: EN 60079-15:2005
 Standards: EN 60079-2:2004

Produkt-Nr.: <i>Product No.:</i>	Modul	Produktnummer
	AO2000	24031-0-000000000000 24041-200300000000
	Gehäuse <i>Housing</i>	24311-0-206000000000 24311-0-406000000000 24341-200320000000 24341-200330000000
	Elektronikmodul <i>Electronic Module</i>	24411-0-500000000000 24441-200300000000
	IR-Analysatormodul Uras26 <i>IR Analyzer Module</i>	24541-200300060600
	WL-Analysatormodul Caldos25 <i>TC Analyzer Module</i>	24741-200300050600
	WL-Analysatormodul Caldos27 <i>TC Analyzer Module</i>	24742-200300050600
	O ₂ -Analysatormodul Magnos206 <i>Oxygen Analyzer Module</i>	24641-200300050600

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Translation

(1) Type Examination Certificate

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

- (3) **BVS 07 ATEX E 013 X**

- (4) **Equipment:** Gasanalysator type AO2000

- (5) **Manufacturer:** ABB Automation GmbH

- (6) **Anschrift:** 60488 Frankfurt/Main, Germany

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

- (8) The certification body of EXAM BBG Prüf- und Zertifizier GmbH certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design of Category 3 equipment intended for use in potentially explosive atmospheres, given in Annex II to the Directive.
The examination and test results are recorded in confidential test and assessment report BVS PP 07.2009 EG.

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

EN 60079-15:2005 Typ of protection 'n'
EN 60079-2: 2004 Pressurized apparatus 'p'

- (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 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 3G Ex nA py II T4**

EXAM BBG Prüf- und Zertifizier GmbH

Bochum, dated 07. February 2007

Signed: Dr. Jockers

Certification body

Signed: Dr. Eickhoff

Special services unit

Continued on next page



(13) Appendix to

(14) **Type Examination Certificate**

BVS 07 ATEX E 013 X

(15) 15.1 Subject and type

Gas analyser type AO2000

15.2 Description

The analyser type AO2000 serves for measuring of components in flammable or non-flammable gas mixtures. The analyser consists of a metallic enclosure of degree of protection IP 54, which is in the case of flammable gas mixtures pressurized (py-purging) with continuous flow of protective gas (inert) according to EN 60079-2:2004.

Inside the enclosure are the central unit, the different analyser modules (Uras26, Caldos25, Caldos27 and Magnos26) as well as the control system for the pressurization.

15.3 Parameters

15.3.1 Electrical data

Supply

100 V ...	240 V	AC
max.	2,2 ... 0,7	A
	47 ... 63	Hz

Supply of the analyser modules

	DC 24	V
max.	80	W

Signal circuits

max.	30 V / 1	A
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15.3.2 Pneumatic data

Minimum flow (continuous flow)

see instructions

Minimum purge time

see instructions

(16) Test report

Nr. BVS PP 07.2009 EG, dated 07.02.2007

(17) Special conditions for safe use

The user shall take suitable measures to stop flow of measuring gas after alarm of the control system.

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

44809 Bochum, 07.02.2007
BVS-Wit/Mi A 20060784

EXAM BBG Prüf- und Zertifizier GmbH


Certification body


Special services unit

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