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ABB MEASUREMENT & ANALYTICS

# **The specialists for hazardous areas**

## Advance Optima and EasyLine





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**ABB Analytical possesses decades of experience in the area of explosion protection. This competence is unified with a unique portfolio based on the Advance Optima and EasyLine series.**

**Simplicity is key for safe operation in hazardous areas and ABB Analytical offers the right analyzer portfolio from extractive to in-situ analyzers.**

**Independent if ATEX, IECEx, CSA, or further local approvals are needed for installation in plants with potentially explosive gas atmospheres in Zone 1 and Zone 2, ABB is your one stop shop.**

# Advance Optima and EasyLine

## Two analyzer series fits all

With Advance Optima (AO2000 Series) and EasyLine (EL3000 and EL3060 Series) ABB offers a broad range of continuous gas analyzers for the measurement in hazardous areas. From simple measuring task up to complex and flexible system solution, these are all possible with the EL3000, AO2000 and EL3060. Furthermore, a wide variety of different measuring technologies are available with all needed local certificates ex-works.



### AO2000

Zone 2 or  
Class 1, Division 2



### AO2000-LS25

Zone 1, 2, 21, 22 or  
Class 1, Division 2



### AO2040-Fidas24 Ex

Zone 1, 2, 21, 22



### EL3040

Zone 2



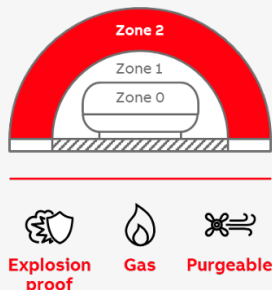
### EL3060

Zone 1, 2

# Zone 2 non-flammable gases / Class I, Div. 2

## AO2000

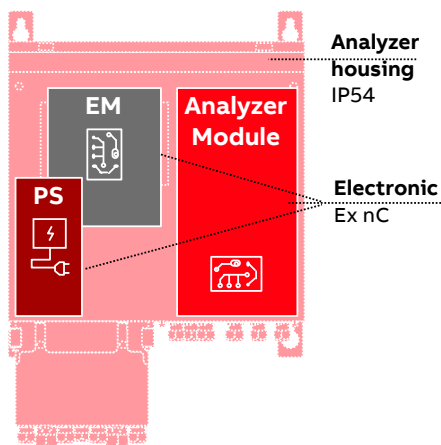
Whole functionality and flexibility of the Advance Optima series is also available for Zone 2 installation, for measurement of non-flammable gases, or for Class I, Division 2 installation. There is no need for additional case purging, all the assemblies have been tested to ensure that they are non-incendive.



### Protection concept

An AO2000 device for operation in Zone 2, for measurement of non-flammable gases, or Class I, Division 2, is based on non-incendive Ex nC electronic components encapsulated in a tough IP54 housing. Both versions do not require an additional purge system. Available analyzer modules are Uras26, Magnos28 and Caldos25/27.

—  
AO2000 concept  
based on Ex nC



### Multi-analyzer system

In its most extensive version, an Advance Optima multi-analyzer system consists of four analyzer modules and it can measure six different components. All the modules are operated by the central processing unit – and the analyzer module can even be installed up to 350 m away.

### 'Packaging' that fits right in

Two system housings in IP54 are available: a 19" slide-in version for cabinet installation and a wall mounted housing.

### Integrated control and monitoring

High performance processor technology for rapid signal processing is used for sophisticated calculations, such as cross-sensitivity corrections and auto-calibration. Internal PLC functions with programmable function blocks eliminate the need for additional external logic controllers.

### Simple, user-friendly operation

- Simultaneous display of up to six sample components
- Clear status and maintenance messages
- Operation menus with online help
- 10 menu languages are available
- Operator controls can be customized

### Certificate and product concept

- Explosion proof design: Ex nA nC IIC T4 Gc
- Non-flammable sample gas
- Housing AO2020 / AO2040
- Housing design in IP54
- Housing can be purged for corrosion protection
- Certified in accordance to:



### Additional Information

Additional Information on AO2000  
System is available at  
[www.abb.com/.../ao2000](http://www.abb.com/.../ao2000).  
Alternatively simply scan this code:



# EL3040

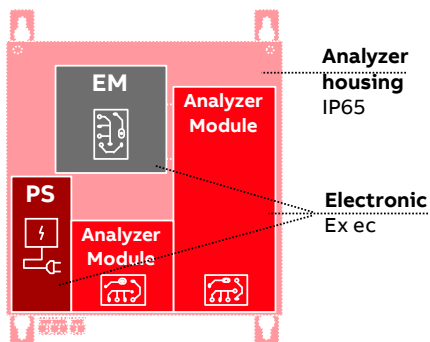
“So smart, they’re simple” of the EasyLine series, is for sure also valid for the measurement of non-flammable gases in hazardous area Zone 2. The compact EL3040 housing can combine up to two analyzer modules in one housing and can be operated with the smart operation concept of EasyLine.



## Protection concept

An EL3040 device for operation in Zone 2, for measurement of non-flammable gases, is based on non-sparking Ex ec electronic components encapsulated in a tough IP65 housing. An additional purge system is not required. Available analyzer modules are Uras26, Magnos28, Caldos27 and O<sub>2</sub>-Sensor.

—  
EL3000 concept  
based on Ex ec



## Certificate and product concept

- Explosion proof design: Ex ec IIC T4 Gc
- Non-flammable sample gas
- Housing EL3040
- Housing design in IP65
- Housing can be purged for corrosion protection
- SIL 2 declaration for Magnos28 analyzer module
- Certified in accordance to:



## Easy configuration

Easy to select the right product, tailored to your needs and stress-free set up after delivery

- Delivered tailored for each application
  - Configurable measuring ranges
  - Single dynamic range with two measuring ranges
  - Modular I/O based on your needs
- All commonly used functions accessible via HMI
- Every analyzer shipped with PC configuration tool for custom parameter setting

## Easy integration

Good fit for each application, options to fit your needs, I/O for every eventuality

- Control up to 7 external solenoid valves
- Industry standard I/O
  - 0/4...20 mA for each component
  - Standard 4 x DI, 4 x DO (Max. 12/12)
  - Standard Modbus TCP/IP
  - Optional Modbus RTU or Profibus

## Easy operation

No complex menu structure means no training and no manual necessary

- Intelligent 4-way navigation
- Flat menu structure
- Password protection for expert levels

## Additional Information

Additional Information on EL3040  
System is available at  
[www.abb.com/.../el3000](http://www.abb.com/.../el3000).  
Alternatively simply scan this code:

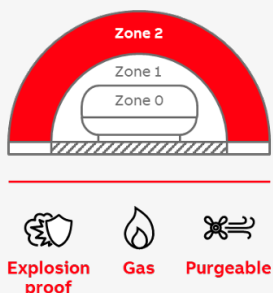




# Zone 2 flammable gases

## AO2000 “Safety Concept”

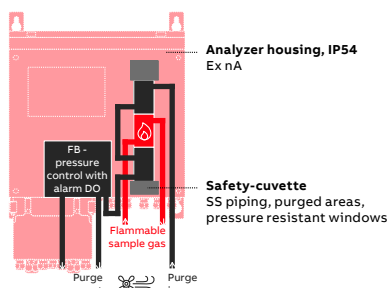
The “Safety Concept” of the Advance Optima series ensures the impermeability of its measuring system, minimizes the purging volume and realizes a simple setup for the measurement of flammable gases in hazardous Zone 2. Individual system solutions with an external purge controller or a separate purgeable housing are redundant.



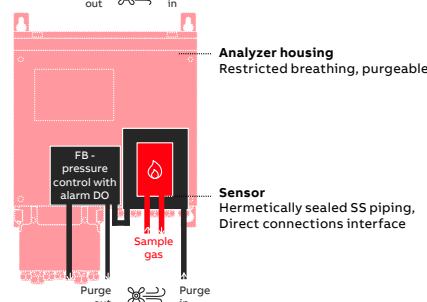
### Protection concept

An AO2000 Safety Concept device is based on non-incentive Ex nA electronic components and a simplified pressurized encapsulation Ex pyb around the analyzer module Uras26, Caldos25/27 and Magnos28.

Safety Concept based on Ex pyb for Uras26



Safety Concept based on Ex pyb for Magnos28 Caldos25/27



### Certificate and product concept

- Explosion proof design: Ex nA pyb II T4 Gc
- Flammable / non-flammable sample gas
- Housing AO2020 / AO2040
- Housing design in IP54
- No flame barrier needed
- Certified in accordance to:



### Smart purge concept

To separate the flammable gases from the Zone 2 environment, only the gas path will be purged and not the whole housing. This lowers the purge gas consumption to a minimum.

The Uras26 uses a special safety cell where only the windows of the measuring cuvette are purged by inert gas (e.g. N<sub>2</sub>). The purge gas pressure is kept slightly above the sample gas pressure, this prevents the sample gas from escaping into the purge gas path.

The analyzers Caldos/Magnos are purged by using the same procedure. Only the measuring chambers in the thermostat housings are purged. The sample gas is fed directly from the external connections into the measuring chamber, so that encapsulation from the electronics is also provided here.

### Smart monitoring concept

With the Safety Concept, the monitoring system for the Ex p protection is part of the system software. There is no need to use external purge controller and alarms will be generated. Furthermore, the system can be continuously monitored via networks, offers digital alarm contacts and error messages, also as e-mail, SMS or can be connected to the asset management software “AnalyzeIT Explorer”.

### Additional Information

Additional Information on AO2000 System is available at [www.abb.com/.../ao2000](http://www.abb.com/.../ao2000). Alternatively simply scan this code:



# Zone 1 / Class I, Div. 2

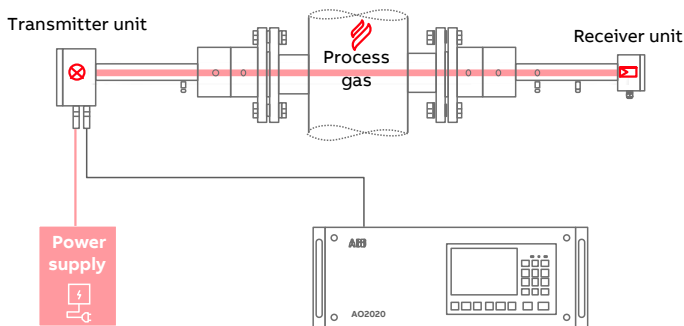
## AO2000-LS25

If harsh process conditions or fast process control necessitates an In-Situ measurement, we can offer the right solution, even in hazardous area. AO2000-LS25 is available in special versions for installation in Zone 1 or Zone 2 for gas environment as well as in Zone 21 or Zone 22 for dust environment. A Class I, Division 2 version is also available.



### Protection concept

An AO2000-LS25 device is always based on limitation of optical radiation Ex op is for the laser beam. The whole electronic components are non-incendive Ex nC and for Zone 1 in addition a pressurized encapsulated Ex pxb. The needed AO2000-CU is based on non-incendive Ex nC electronic components.



AO2000-LS25 concept based on Ex op is

### Flexible for setup

An AO2000-LS25 consists of an LS25 analyzer module, an AO2000-CU, for data processing and a power supply to power up the LS25 analyzer. The analyzer can be installed In-Situ up to Zone 1, the power supply and AO2000-CU safer, in Zone 2 or ex-free.

### Flexible for process conditions

Harsh process conditions are not a problem for LS25, so measurements are possible, for example, under high process temperatures, high process pressures, high dust loads and even with corrosive gases. The analyzer is mounted directly on flanges, purge gas connections and a tilting mechanism for easy alignment are included in the purge flange.

### Flexible for component selection

The LS25 offers a huge range of different measuring components, also for critical gases (HCl, NH<sub>3</sub>, HCN, HF,...), as well as a wide selection for dual component measurement (CO/CH<sub>4</sub>, NH<sub>3</sub>/H<sub>2</sub>O, HCl/CH<sub>4</sub>, CO/H<sub>2</sub>O, ...).

### Certificate and product concept

- Explosion proof design: Ex pxb [op is Ga] IIC T4 Gb
- Explosion proof design: Ex pxb [op is Da] IIIC T100°C Db
- Explosion proof design: Ex nA nC [op is Ga] IIC T4 Gc
- Explosion proof design: Ex tc [op is Da] IIIC T100°C Dc
- Zone 0 Gas
- Housing design in IP54
- Certified in accordance to:



### Additional Information

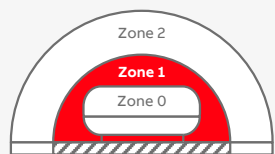
Additional Information on AO2000 System is available at [www.abb.com/.../ao2000](http://www.abb.com/.../ao2000). Alternatively simply scan this code:



# Zone 1

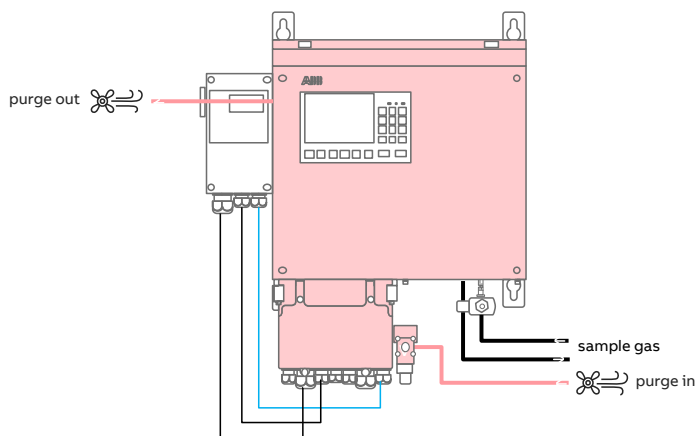
## AO2040-Fidas24 Ex

Would you light a flame in hazardous area? We do! AO2040-Fidas24 Ex is a compact product solution designed around the standard AO2040 field housing to measure total hydrocarbons. The analyzer is certified for used in hazardous areas with gas (Zone 1, Zone 2) as well as in hazardous areas with dust (Zone 21 or Zone 22).



### Protection concept

An AO2040-Fidas24 Ex device is based on a pressurized encapsulation Ex pxb around the Fidas24 analyzer module and an intrinsically safe Exib display and control unit for operation of the analyzer.



AO2040-Fidas24 Ex concept based on Ex pxb

### Certificate and product concept

- Explosion proof design: Ex pxb ib IIC T3 Gb
- Explosion proof design: Ex pxb ib [ib] IIIC T195°C Db
- Explosion proof design: Ex pxb ib IIC T3 Gc
- Explosion proof design: Ex pxb ib [ib] IIIC T195°C Dc
- Flammable / non-flammable sample gas
- No flame barrier needed
- Housing design in IP65
- Certified in accordance to:



### Simple solution

AO2040-Fidas24 Ex is a compact product solution designed around the standard Fidas24 analyzer module. It is not necessary to built-up an expensive and individual engineered system solution, to fulfill the requirements for installation in hazardous areas.

### Simple design

With the AO2040-Fidas24 Ex there is no need on user's side for additional installation or individual certification. All needed components are mounted on the AO2040 housing and are certified ex-works.

### High-efficient protection

As the Fidas24 is handling hydrogen in general, the safety level of the analyzer itself is already quite high. Based on this, the required housing purge can be realized with simple instrument air, anyhow needed for the FID operation. There is no need to use nitrogen.

### Additional Information

Additional Information on AO2000 System is available at [www.abb.com/.../ao2000](http://www.abb.com/.../ao2000). Alternatively simply scan this code:





# EL3060

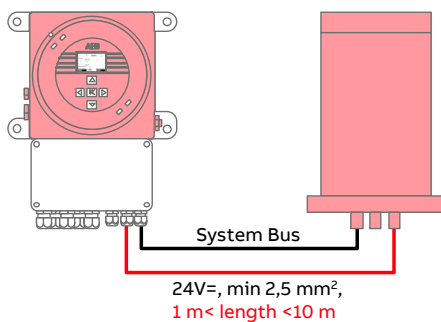
EL3060, the first choice for installation in hazardous area Zone 1! This analyzer series uses the analyzer modules with the same measuring performance as in the Advance Optima series and combined it with the simplicity of the EasyLine series. That makes the EL3060 a powerful but compact and easy to handle solution.



## Protection concept

An EL3060 device is made up of the flameproof Ex db enclosed control unit with an increased safety Ex eb junction box.

- integrated into the housing of the control unit
  - Magnos28, Caldos25 or Caldos27
- built into a separate flameproof Ex db enclosure which is connected to the control unit for data transfer and power supply
  - Uras26



EL3060 concept based on Ex db

## Certificate and product concept

- Explosion proof design: Ex db eb IIC T4 Gb
- Explosion proof design: Ex db IIC T4 Gb
- IIC classification, able for Acetylene / Hydrogen ambiances
- Flammable or non-flammable sample gas (Zone 1 gas)
- Housing can be purged for corrosion protection
- Housing designed in IP65
- SIL 2 declaration for Magnos28 analyzer module
- Certified in accordance to:



## Easy to combine

The oxygen or the thermal conductivity analyzer can be combined with the infrared photometer. This means that complex measuring requirements with up to five measuring components in one device can be fulfilled.

## Easy to install

The control unit is provided with a terminal box with increased safety Ex eb. Without compromising the hazardous area protection customers can safely and easily connect signal cables for analog output and status signals.

## Easy to operate

- Operation directly through an explosionproof glass pane
- Touch-sensitive keys
- Multi-lingual, menu-driven operating interface
- Menu structure according to the EasyLine series
- Safe and reliable operation at any time, without having to open the housing

## Additional Information

Additional Information on EL3060  
System is available at  
[www.abb.com/.../el3060](http://www.abb.com/.../el3060).  
Alternatively simply scan this code:



# The different analyzer modules

## ...for use in hazardous area!



### Uras26

#### Infrared photometer

Uras26 is an NDIR photometer which can measure up to four infrared active gases simultaneously.

- Components: CO, NO, N<sub>2</sub>O, SO<sub>2</sub>, CO<sub>2</sub>, CH<sub>4</sub>, C<sub>3</sub>H<sub>8</sub>, C<sub>2</sub>H<sub>4</sub>, ...
- Ranges: 0 - 5 ppm up to 100 vol%
- Measure up to 4 components simultaneously
- Measure up to 2 gas streams continuously
- Easy to add and change measuring components in field
- Internal calibration cells minimize cost of ownership
- Gas-filled detectors for highly selective measurement



### Magnos28

#### Paramagnetic detector

Magnos28 is a paramagnetic oxygen analyzer which can measure Oxygen.

- Components: O<sub>2</sub>
- Ranges: 0 - 0.5 vol% up to 100 vol%
- Patented microwing® offers improved repeatability
- Semi-automatic manufacturing for consistent quality
- Inert materials suitable for corrosive applications
- Fast response for improved process control



### O<sub>2</sub>-Sensor

#### Electrochemical sensor

The O<sub>2</sub>-Sensor is an electrochemical oxygen sensor which can measure Oxygen.

- Components: O<sub>2</sub>
- Ranges: 0 - 1 vol% up to 25 vol%
- Low cost option for O<sub>2</sub> measurement



### Fidas24

#### Flame ionization detector

Fidas24 is a single component flame ionization detector (FID).

- Components: THC, TOC, VOC, CnHm
- Ranges: 0 - 10 ppm up to 10,000 ppm
- Excellent temperature stability through single block design
- Automatic and reliable re-ignition on flame out
- Injector for sample transport with no moving parts



### Caldos25

#### Thermal conductivity detector

Caldos25 measuring principle is based on the differences in thermal conductivity between gases. The Caldos25 is designed for highly corrosive applications.

- Components: H<sub>2</sub> in N<sub>2</sub> or air, SO<sub>2</sub> in N<sub>2</sub> or air, H<sub>2</sub> in Cl<sub>2</sub>, ...
- Ranges: 0 - 100 vol.% or 0 vol.%-saturation
- Zero-point calibration and end-point calibration



### Caldos27

#### Thermal conductivity detector

Caldos27 measuring principle is based on the differences in thermal conductivity between gases. Small measuring ranges and fast measurements are characteristic for Caldos27.

- Components: H<sub>2</sub>, He, Ar, N<sub>2</sub>, ...
- Ranges: 0 - 0.25 vol% up to 100 vol%
- Flexibility to cover wide variety of applications
- Fast response (T<sub>90</sub> < 2s) for improved process control



### LS25

#### In-Situ Laser

LS25 is an In-Situ laser analyzer which selectively measures the concentration of up to two IR active sample components directly in the process.

- Components: O<sub>2</sub>, NH<sub>3</sub>, HCl, H<sub>2</sub>O, CO, CO<sub>2</sub>, CH<sub>4</sub>, HCN, NO, NO<sub>2</sub>, ...
- Ranges: 0 - 2 ppm up to 0-100vol%
- Dual components possible
- Analyzer for harsh conditions
- Up to max. 10 bar
- Up to max. 1500 °C
- High dust loads
- Up to 4 analyzers per central unit

# Product selection matrix

## Quick finder for the right analyzer

	EL3060					AO2000-LS25	AO2040-Fidas24 Ex	AO2000					EL3040			
	Uras26	Magnos206	Magnos28	Caldos25	Caldos27	LS25	Fidas24	Uras26	Magnos206	Magnos28	Caldos25	Caldos27	Uras26	Magnos206	Magnos28	Caldos27
Zone 1	•	•	•	•	•	•	•									
Zone 21						•	•									
Zone 2 flammable gases	•	•	•	•	•	•	•	•	•	•	•	•				
Zone 2	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Zone 22						•	•									
Class I, Div.2						•		•	•	•	•	•				
ATEX	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
IECEX	•	•	•	•	•	•	•									
CSA						•		•	•	•	•	•				
EAC	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
NEPSI	•	•		•	•			•	•		•	•	•	•	•	•
TIIS	•	•			•											
KC's	•	•		•	•			•	•		•	•				

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