

Currently undergoing TÜV  
suitability test in accordance with  
EN 15267, part 1-3, for TA-Luft, 13., 17.  
and 30. BImSchV (Federal immission control  
regulation) and all plants subject to licensing



Measurement & Analytics | Measurement made easy

# ACF5000

## Multi-component analyzer system

From the pioneer in FTIR-based  
CEM systems

# Comprehensive measurement solutions

## Serving any industry

### World-class measurement solutions

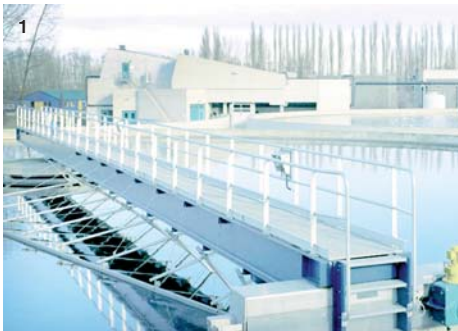
ABB measurement products provide world-class measurement solutions for any industry, utility or municipality. Latest innovations deliver technological solutions to make it easier for you to run your plant. ABB's measurement products are based on common technology, providing a common look and feel and method of operation. This results in products that are easy to configure, easy to integrate, and easy to maintain.

For more information please visit:  
[www.abb.com/measurement](http://www.abb.com/measurement)

### ABB's measurement products portfolio:

- Analytical measurement
- Flow measurement
- Natural gas measurement
- Valve automation
- Pressure measurement
- Temperature measurement
- Recorders and controllers
- Level measurement
- Device management
- Force measurement
- Service

1 Water and waste water | 2 Power and industrial steam | 3 Chemical and petrochemical | 4 Oil and gas | 5 Pulp and paper | 6 Minerals | 7 Metals | 8 Food and beverage | 9 Marine



# ACF5000

## Specialist for emission monitoring

ACF5000 is an analyzer system to monitor the composition of exhaust gases.

...a complete CEM system with easy operation and minimum maintenance.

...with worldwide support by certified service specialists.



### The multi-component analyzer system ACF5000 offers:

- Simultaneous measurement of 15 gas components
- Proven hot/wet extractive measurement
- Powerful and proven FTIR technology
- Complete system with a compact and modular design
- One single sampling system for all sample gases with a unique air-driven aspirator pump
- Low cost of ownership
- Communication, control and maintenance via PROFIBUS, Modbus, TCP and Ethernet (OPC)

### Typical applications

- Hazardous waste incinerators
- Cement plants
- Lime kilns
- Thermal treatment of contaminated soils
- Solvent recovery and destruction at pharmaceutical plants
- Municipal waste incinerators
- Biomedical waste incinerators
- Waste pyrolysis
- Gasification
- Power plants
- Combustion of coal, oil, waste or sludge
- Steel and aluminum smelters
- Brick, tiles and glass manufacturing
- Catalyst protection monitoring
- Combustion research

### International certifications (in preparation)

- CEM system certification in accordance with EN 15267 is being prepared by TÜV Germany and MCERTS UK
- Suitable for measurement tasks in accordance with European Directives such as 2010/75/EC, 2000/76/EC, 2001/80/EC and quality assurance in accordance with EN 14181
- Compliant to US EPA 40 CFR 60 and 40 CFR 75
- GOST-R certificate

# ACF5000

## Future-oriented technology

ABB's new analyzer system, ACF5000, is the specialist for emission monitoring from the pioneer in FTIR-based CEM systems. This is the 4th generation of the system. Since the introduction of this technology in 1993, ABB has sold more than 1600 units worldwide.

The standard system design combines the advantages of a FTIR spectrometer with proven flame ionization (FID) technology to measure VOC and ZrO<sub>2</sub> technology for oxygen measurement.

The high-resolution FTIR spectrometer provides selective measurement of infrared active gas molecules with high sensitivity and stability. It simultaneously measures up to 15 components of all relevant pollutants.

Unlike other technologies, FTIR-technology allows you to add IR-components software without the need for hardware upgrades.

The optional FID sensor measures hydrocarbons at ppm levels. Alternatively, if permitted by local authorities, the volatile organic components (VOC) can be measured with the FTIR spectrometer. The oxygen sensor is based on proven ZrO<sub>2</sub> technology.

The analyzer system is designed for a reliable operation with long maintenance intervals. The ACF5000 can be optionally equipped with a validation unit for automatic span drift check. This unit can reduce costs for test gases cylinders. A maintenance-free injector pump is built-in for gas sampling. The ACF5000 also offers a probe back purge module that allows uninterrupted measurements, even in applications with a high level of dust exposure.

QAL3 quality data is generated and reported automatically by the system.

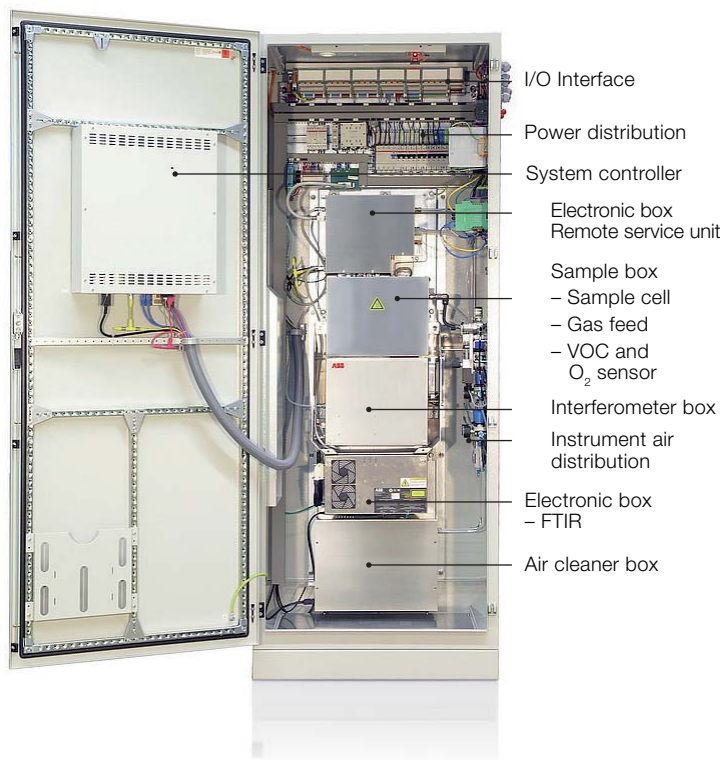
The ACF5000 is also designed to integrate signals from other sensors, such as dust, flow, or mercury analyzers to transport these signals via digital communication, to a DAHS\*, a PLC or DCS. For communication, ACF5000 supports all industrial standards like Ethernet (OPC), Modbus and PROFIBUS.

### Future-oriented, best-in-class technology

- Inherent stability of FTIR-technology – for long maintenance intervals
- Large number of gas components – prepared for future regulations
- Integrated ongoing system validations
- Lowest limit of detection – suitable for monitoring the smallest emission limit values
- Highest range dynamics – to monitor plant start-up and shut-down

### Complete pre-engineered system with various options

- On-site software upgrades enable the addition of IR-components
- PROFIBUS, Modbus or Ethernet offers connectivity to PLC, Data Acquisition Handling Systems (DAHS) or DCS
- Capacity to integrate external signals and communicate with PLC, DAHS or DCS via single serial line to reduce wiring
- Built-in PLC functionality to tune the application
- Optional probe back purge module for measurements in applications with high levels of dust exposure
- Stream-switching for monitoring of two streams sequentially; also for redundancy purposes in standby mode
- Local control for service purposes via Ethernet and remote maintenance via UMTS
- User-friendly display and operator interface





# High stability and accuracy

## Low cost of operation

### Low cost of operation

- Save cylinder gas with internal calibration standards
- Integrated automated QAL3 procedure releases the operator from QAL3 reporting duties in accordance with EN 14181
- Increased availability by remote service and diagnosis

### ABB – a reliable partner

- Leader in FTIR-based continuous CEM systems
- More than 20 years of experience in FTIR spectrometers in process gas analysis
- More than 1600 installed analyzer systems worldwide
- High technological competence – all analyzers manufactured in-house by ABB

### Measuring principle

The Fourier Transformation Infrared (FTIR) spectroscopy provides the simultaneous measurement of all components which absorb in the IR spectrum. The laser-controlled interferometer ensures optimum performance and highest repeatability. Optics and the multi-reflex measuring cell are separated from the gas stream. In this way, all optical parts are perfectly protected against corrosive sample gases.

The signals obtained from the IR-detector are processed in the system controller by applying a Fourier transformation.

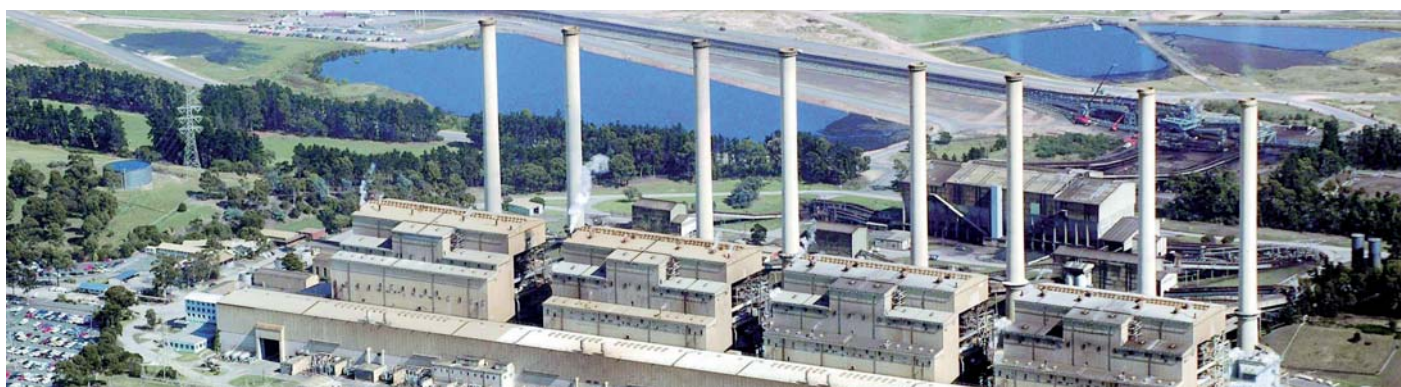
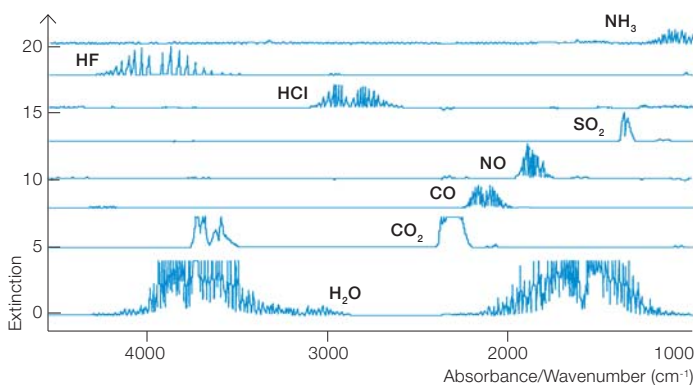
### Measured components and measuring ranges

FTIR	Low range		High range	
H <sub>2</sub> O	0–40 Vol.-%			
CO <sub>2</sub>	0–30 Vol.-%			
CO	0–75 mg/m <sup>3</sup>	0–60 ppm	0–4000 mg/m <sup>3</sup>	0–3200 ppm
NO	0–150 mg/m <sup>3</sup>	0–110 ppm	0–2000 mg/m <sup>3</sup>	0–1500 ppm
NO <sub>2</sub>	0–80 mg/m <sup>3</sup>	0–40 ppm	0–600 mg/m <sup>3</sup>	0–300 ppm
N <sub>2</sub> O	0–50 mg/m <sup>3</sup>	0–25 ppm	0–1000 mg/m <sup>3</sup>	0–500 ppm
SO <sub>2</sub>	0–75 mg/m <sup>3</sup>	0–25 ppm	0–1500 mg/m <sup>3</sup>	0–525 ppm
NH <sub>3</sub>	0–5 mg/m <sup>3</sup>	0–7 ppm	0–230 mg/m <sup>3</sup>	0–300 ppm
HCl	0–15 mg/m <sup>3</sup>	0–10 ppm	0–200 mg/m <sup>3</sup>	0–125 ppm
HF	0–3 mg/m <sup>3</sup>	0–3 ppm	0–6 mg/m <sup>3</sup>	0–7 ppm
CH <sub>4</sub>	0–7.5 mg/m <sup>3</sup>	0–10 ppm	0–200 mg/m <sup>3</sup>	0–280 ppm
CH <sub>2</sub> O	0–20 mg/m <sup>3</sup>	0–15 ppm		
VOC <sup>1)</sup>	0–30 mg/m <sup>3</sup>	0–15 ppm	0–300 mg/m <sup>3</sup>	0–150 ppm
<b>FID</b>				
VOC	0–15 mg/m <sup>3</sup>	0–8 ppm	0–300 mg/m <sup>3</sup>	0–150 ppm
<b>O<sub>2</sub>-Sensor</b>				
O <sub>2</sub>	0–25 Vol.-%			

<sup>1)</sup> VOC measured with FTIR (for process measurement only)

Measuring ranges within ignition limits cannot be provided. Other measured components and measuring ranges on request.

### IR absorption spectrum



# The Added Value

## What you can expect from a market leader

As one of the world's leading suppliers of analyzer technology, we offer our customers additional benefits and services other manufacturers cannot provide. With the added values ABB Analytical helps to improve performance and reliability at work.

### **Best choice of analyzers tailored to your needs**

We offer the broadest selection of measuring principles under one roof. All types of analyzers share a common operation to reduce the need for training and spare parts.

### **Certified sales and service partners wherever you are**

Our "Manufacturer Certified Service" program involves more than 300 service specialists with many years of experience and comprehensive know-how working for our clients on-site worldwide. Our engineers are your professional partners dedicated to finding the best solutions for your measuring tasks. They regularly undergo manufacturer training and certification.

### **Long-term security in your investment**

Our comprehensive and transparent life cycle plan for each of our products covers the service of spare parts and service support for their entire lifetime. Our products are extendable with upgrade programs keeping them technologically up-to-date at all times.

### **Most powerful software solutions**

Full remote control and maintenance access to the system inside a protected network and quality monitoring (QAL3) are available for ABB analyzers. Integrated controllers with PLC functionality provide monitoring while controlling the measurement from sample taking right up to analysis.

### **Unique time and cost saving calibration concepts**

ABB has 30 years of unrivalled experience in producing gas-filled calibration cells, allowing internal calibration without test gas cylinders for photometers. Single-point calibration with ambient air as the standard gas is also possible.

### **Unrivalled options for connectivity**

ABB gas analyzers and systems excel in Ethernet network abilities and Modbus or PROFIBUS interfaces. This enables the analyzer data to be easily read, archived and visualized on a PC, PLC or process control system.

### **Assured quality through independent certification**

ABB provides all major international certificates for CEMS, hazardous area installations, metrological approvals, electrical safety and quality and environmental management.



# Expertise in technology

## More than a century of experience

To operate any process efficiently, it is essential to measure, actuate, record and control. With ABB's measurement products and solutions, you receive the best technology combined with the most reliable products available on the market.

ABB offers a broad range of life cycle services for optimum product performance. A global network of measurement product specialists delivers local service and support.

Research and development is a vital source of ABB's technology leadership. It builds on the foundation of existing technologies for new applications, and continues to develop the breakthrough technologies needed to meet future challenges.

ABB and its heritage companies have been leaders in innovation and technology for more than 100 years.

**Aztec**

**Bailey**

**BOMEM**

Bush Beach Engineering  
Limited

**FISCHER  
& PORTER**

**Hartmann & Braun**

**K-TEK**

**Kent**

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