
ABB MEASUREMENT & ANALYTICS

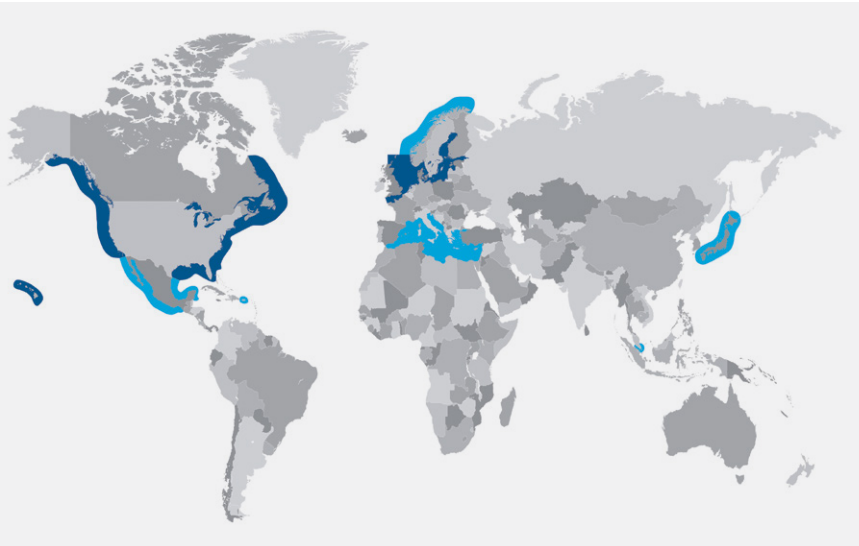
Emission monitoring for maritime industry

We are on your wavelength



Emission monitoring for maritime industry

We are on your wavelength



■ ECAs
■ Possible future ECAs

The measurement requirement

The International Maritime Organization (IMO) set out the MARPOL Annex VI regulations aiming the control of the main air pollutants emitted by vessels. These regulations focus on the control and reduction of sulphur oxides (SO_x) and nitrous oxide (NO_x) emissions:

- Regulation 14 for control and monitoring of SO_x emitted
- by the combustion of heavy fuel oils (HFO) engines
- Regulation 13, for control of NO_x emitted by the combustion of diesel engines

SO_x control guidelines are specified in the MEPC.259 (68). They apply in all Emission Control Areas (ECAs) starting January 1st 2015 on and will start in 2020 globally. In order to control the efficiency of Exhaust Gas Cleaning Systems (EGCS) and following MEPC.259 (68), measurement of SO_x/CO₂ ratio is required.

The NO_x Technical Code (NTC) 2008 contains conditions and processes for NO_x emission control. It foresees continuous emission monitoring (“direct measurement”) as method for ensuring NO_x emission compliance, starting on January 1st 2016.

Currently the main ECAs are the Baltic Sea, the North Sea, all the North American and Caribbean coastal areas.

The addition of new areas to current ECAs is under evaluation by IMO. Ship yards, ship owners and marine ECGS manufacturers need to equip vessels with continuous gas analyzers for Continuous Emission Monitoring (CEM) to measure:

- Nitrogen Oxides (NO_x)
- Sulfur oxides (SO_x)
- Carbon dioxide (CO₂)

Our offer

The GAA330-M is a CEM system designed to measure the gas pollutants SO₂, CO₂, and NO_x, as specified in MARPOL Annex VI. The GAA330-M operates with both high- and low-sulfur fuels, no matter if you are operating outside or inside an ECA. ABB has the right gas analyzer portfolio to allow vessels to stay compliant with current and upcoming regulations. The GAA330-M uses an Infrared photometer for reporting the SO₂/CO₂ ratio as specified by MARPOL requirements. NO_x is monitored with an ultraviolet photometer (UV) which is the most practical approach. ABB photometers are manufactured and designed for best performance under harshest conditions with an installed base of more than 100.000 units in global industries.

System characteristics

- Standalone cabinet with modular analyzer concept
- Standard measured gases: SO₂ and CO₂
Optional measured gases: NO and NO₂ (NO_x)
- Rugged sample probe and heated sample line included
- Approved measuring technology and pneumatic system
- Digital communication including Ethernet TCP/IP and OPC server

Advantages of ABB

- Global ABB service capability – assistance and technical support is available worldwide
- Modular concept – new measuring modules for future pollutants can be added at any time
- Easy operation with reliable results – ABB analyzers with internal calibration cells, filled with reference gas
- Compliant to
IMO MARPOL ANNEX 14 Res. MEPC 177 (58) (NTC)
IMO MARPOL ANNEX 9 Res. MEPC.259 (68)
IMO MARPOL ANNEX 5 Res. MEPC.103 (49)

Measurement of SO_x/CO₂ ratio

The GAA330-M basic version is equipped with ABB's famous infrared photometer of Uras type. The Uras26 is the latest version of a rugged industrial photometer based on the Non Dispersive IR (NDIR) technology. NDIR is the referenced and recognized technology for monitoring SO₂/CO₂ ratio in MARPOL regulation. The Uras26 photometer allows the selective measurement of SO₂ and CO₂ with class leading accuracy. Internal calibration cells, containing a sealed reliable reference gas, simplify the regular adjustment of span points, without use of external test gas cylinders. The ABB sampling technique is based on a dry and extractive approach, as reported in the MARPOL MEPC 177(58). The pneumatic system used with the Uras26 is approved and certified and it avoids equivalence tests and use of correction factors, making the measurement easy and straight forward.

The GAA330-M equipped with the Uras26 allows for advanced capabilities and calculation of SO₂ (ppm)/ CO₂ (Vol. %) ratio, as it is specified by the MARPOL MEPC 184(59). When using fuels with sulfur content higher than 0.1 Vol. % in ECAs, ships must abate SO₂ and keep SO₂/CO₂ ratio under control at the EGCS (Exhaust Gas Cleaning System).

Measurement of NO_x

The GAA330-M can additionally be equipped with ABB's ultraviolet (UV) photometer of Limas type. The Limas11UV measures NO and NO₂ separately at the exit of the NO_x abatement system, the engine's outlet or directly at the stack. The Non Dispersive UV technology has been specifically developed by ABB for NO and NO₂ analysis and offers operators a simplified approach with no need for auxiliary accessories.

Direct measurement of NO_x (NO_x = NO + NO₂) allows ships to operate engines with the highest flexibility, without time consuming engine re-certifications. An UV based photometer is the superior approach as its technology offers a comparable or better measuring quality than the CLD technology and it doesn't require unpractical and costly accessories such as ozone generator, catalytic converter and dilution systems.

We are on your wavelength

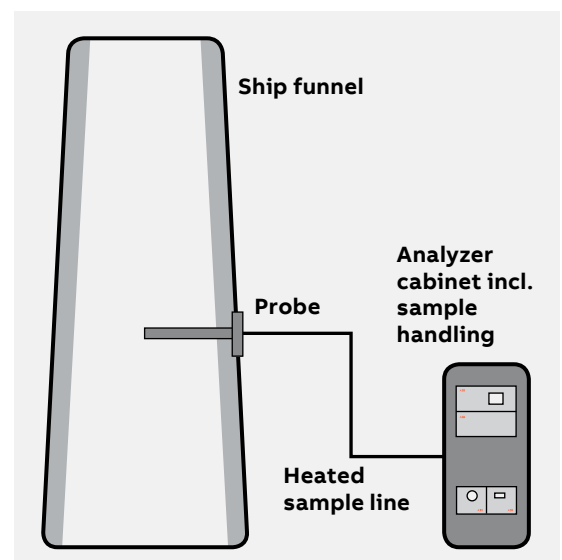
In selecting ABB you are choosing a partner who offers the best measurement solutions for your needs, enabling maximum return on your investment. As a globally operating company ABB knows about the crucial demands of international customers.

Providing the best technology, reliability and service, wherever you are, is ABB's daily business. World-wide available maintenance teams are trained and certified to support you with first-class service – just in time at your location. Benefit from our world wide service network and fast support at any time and in any place. This ensures the fastest and best service capability, assistance and technical support world-wide.

Measurement made easy

ABB's Measurement Products business unit is among the world's leading manufacturer of continuous emission monitoring (CEM) systems. With thousands of experts around the world and high-performance technology, ABB's team is dedicated to make measurement easy for its customers.

ABB operates in around 100 countries and employs about 145,000 people.



**ABB Automation GmbH
Measurement & Analytics**

Stierstädter Str. 5
60488 Frankfurt am Main
Germany
Tel: +49 69 7930-4566
Mail: cga@de.abb.com

abb.com/measurement

