



## EMISSIONS ANALYSIS FOR MARINE APPLICATIONS

Marine vessels can emit air pollution such as CO, CO<sub>2</sub>, NO<sub>x</sub> (NO + NO<sub>2</sub>), and SO<sub>2</sub> from their diesel engines as well as onboard incinerators and boilers. MARPOL Annex VI and the technical code for control of emissions of nitrogen oxides (NO<sub>x</sub> Technical Code) issued by IMO are internationally recognized regulations for the prevention of air pollution and emissions from marine vessels. Ships over 400 gross tons are also required to have an International Air Pollution Prevention (IAPP) certificate which can be obtained by confirming compliance with MARPOL Annex VI.

Compliance to MARPOL Annex VI and the NO<sub>x</sub> Technical Code can be achieved by using a portable emissions analyzer to measure NO<sub>x</sub> and other relevant pollutant gases emitted from marine vessels. Ships are also subject to initial and periodical emissions surveys as well as unscheduled inspections during the validity period of the IAPP certificate where the emitted air pollution levels must be proven to be within compliance levels. If emissions levels exceed allowable limits, then required tuning and adjustments to the engine and other pollution sources must be performed immediately with a new set of emissions measurements to be taken. Ships may not be allowed to pull into some ports until they prove their emissions levels are below permissible levels.



With newer ships that already fall under Tier II (2011) and Tier III (2016) of MARPOL Annex VI, pollution control methods such as catalysts, scrubbers, and SCR systems are now more frequently required to reduce emissions and achieve compliance. A portable emissions analyzer can be used not only to measure the final emissions downstream of the pollutant reduction equipment, but it can also help optimize the performance and quantify the effectiveness of scrubbers and other pollution control units.



The Sauer mann [Si-CA 230](#) portable combustion gas & emissions analyzer can perform reliable and accurate measurements of O<sub>2</sub>, CO, both NO & NO<sub>2</sub> for NO<sub>x</sub>, and SO<sub>2</sub> to help ships achieve and confirm compliance with MARPOL Annex VI and the NO<sub>x</sub> Technical Code.

The analyzer's special hose material and the [Sample Conditioning Unit](#) at the probe handle maintain the integrity and composition of the exhaust gases especially for NO<sub>2</sub> and SO<sub>2</sub> gases.

The [Si-CA 230](#) also includes a long-life O<sub>2</sub> sensor, large color touch screen, and mobile phone app for real-time display & control and creation of details reports.