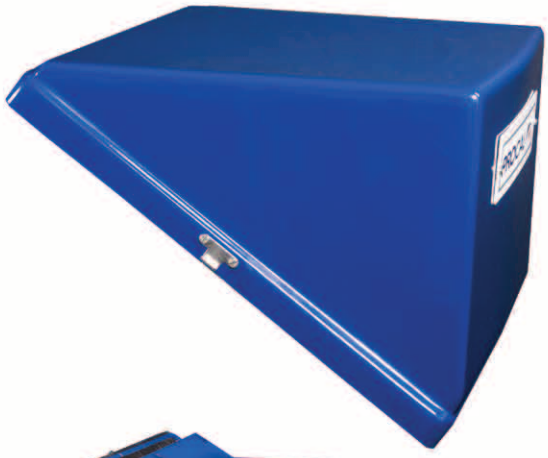
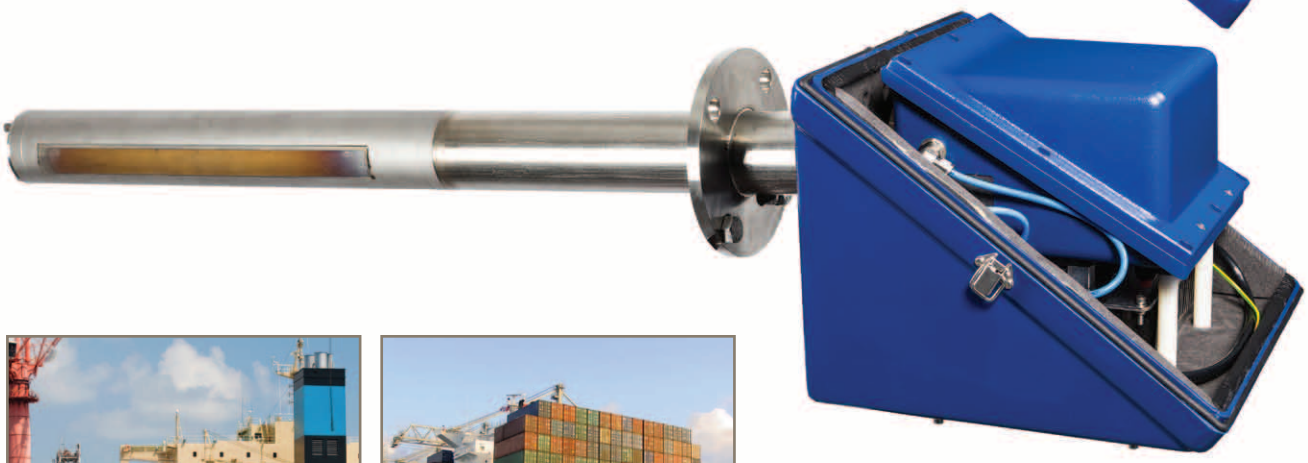
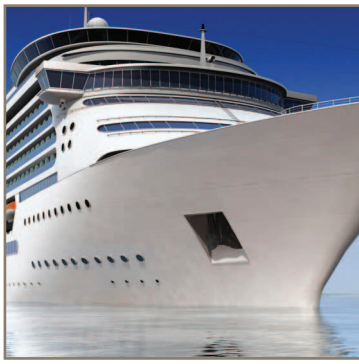
aerospace
climate control
electromechanical
filtration
fluid & gas handling
hydraulics
pneumatics
process control
sealing & shielding





Maritime Emission Monitoring

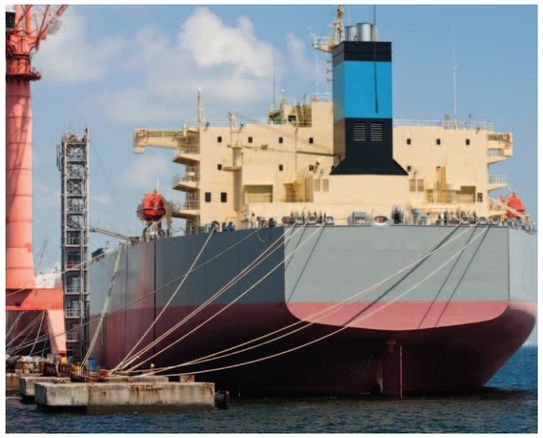


Parker

PROCAL

Maritime Emission Monitoring

Meeting the Environmental Challenge



The need to demonstrate environmental responsibility is key for today's marine and offshore industries. Charterers and the public demand high standards of performance and reliability. Fuels and exhaust gas emissions are also subject of international, regional and national controls. The most significant is IMO MARPOL Annex VI – Regulations for the Prevention of Air Pollution from Ships, which also applies to mobile offshore drilling units and other oil industry platforms.

The most important gases in terms of emissions are currently sulphur oxides – SOx, and nitrogen oxides – NOx. Annex VI has a schedule for significant reductions in both over the next 10 years.

The creation of Emission Control Areas and stringent limits on fuel sulphur content in port are challenging particularly for the shipping industry and its suppliers. Ship operators have near imminent decisions to make based on a complex set of circumstances and a fluid regulatory background.

The penalties for non-compliance are potentially huge. Whilst the pace of change has created uncertainty and appears to have pushed the boundaries for some technologies, the Procal 2000 emissions monitoring system has been proven in long- term service onboard ship as a robust and reliable method of confirming compliance with emissions regulations.

The Emissions Monitoring Solution

The Procal 2000 emissions monitoring system is approved for the analysis of exhaust gases from the engines and boilers of ships and offshore rigs. Robust and with proven reliability, up to six gases can be measured including SO2, CO2 and NOx.

The Procal 2000 emissions monitoring system comprises up to 6 exhaust mounted analysers, each with automatic verification facilities. Emissions data from the entire system is securely managed and displayed at a dedicated Classification Society approved panel PC, with outputs to networks, control systems, and reporting facilities.

The advanced Procal 2000 analyser utilises an in-situ (inside the exhaust) sample cell so avoiding the need to extract gas. Importantly this avoids the use of costly, high maintenance sample handling systems, and enables analysis of an unmodified, truly representative gas sample.

Exhaust gases from the combustion of residual and distillate fuels can be analysed, so that compliance can be confirmed in port, in Emissions Control Areas and in international waters. Procal 2000 includes highly effective sintered filters that prevent the ingress of particulate matter into the sample cell and a heater to prevent condensation and deposits where the exhaust is below its dew point. Construction materials are ideally suited to the marine environment.

The measurement range of Procal 2000 analysers is such that compliance can be confirmed even when regulated emissions are at a very low level. Emissions after an exhaust gas scrubber, that are the equivalent of 0.1% sulphur fuel, are readily measured.

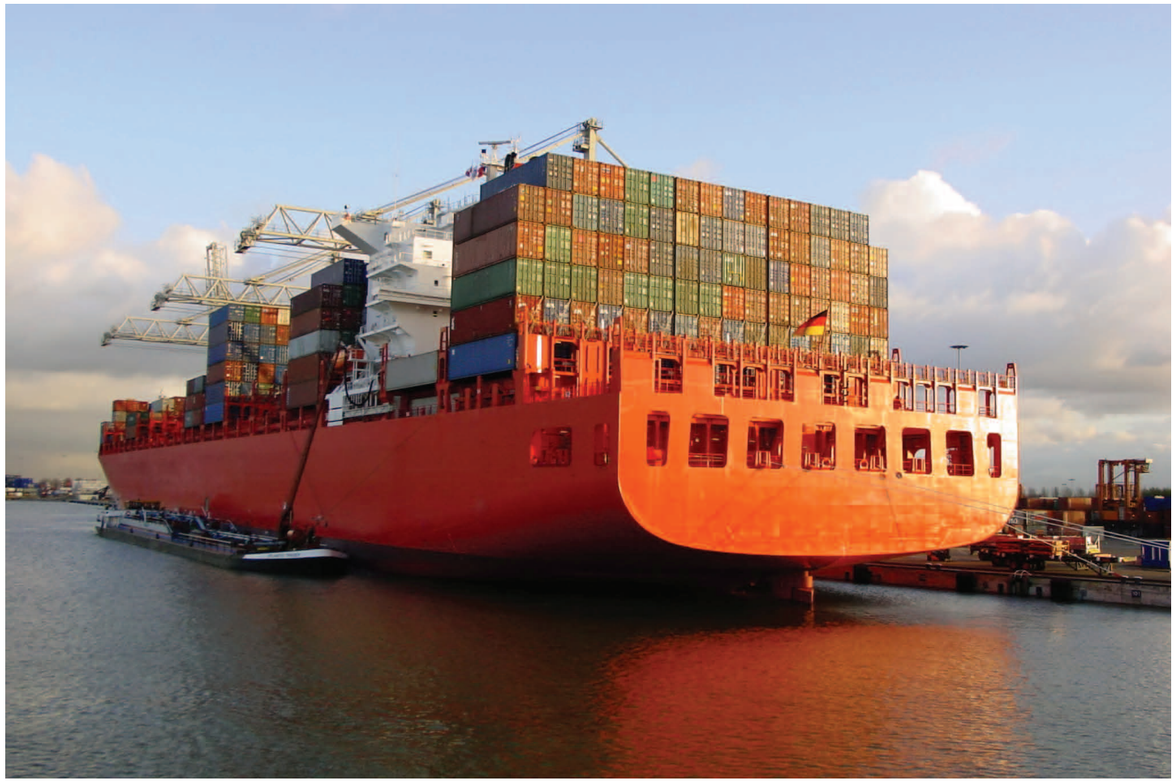
Procal 2000 analyser solutions can be fitted to all sizes of exhaust and ATEX/IEC approved options are available for use in the hazardous areas typically found offshore.

Features

- Proven in service
- Reliable and robust
- Low maintenance and no consumables
- Direct in situ measurement
- One analyser measures multiple gases
- No requirement for extractive sample handling systems
- Auto-verification facilities
- Measurement of exhaust from residual and distillate fuel combustion
- High sensitivity at low levels
- User friendly display and secure recording of data from up to 6 analysers
- Multiple data outputs

Benefits

- Highly effective method of demonstrating emissions compliance
- Minimal impact on staff with a high existing workload
- Simplicity for ships at sea and remote offshore installations
- Truly representative analysis
- Reduced cost of equipment
- Reduced cost of installation and operation
- No operator adjustment ideal for staff inexperienced with emissions analysis
- Enables compliance to be confirmed wherever required and fuel switching to be monitored
- Ideally suited for use with exhaust gas scrubbing equipment and where 0.1% sulphur fuel (or equivalent) is mandatory
- Multiple engines and boilers monitored at a glance
- Support for further emissions control, alarm, and reporting systems



Approvals

UK Maritime and Coastguard Agency

European Commission Directive 2008/67/EC of 30 June 2008, amending Council Directive 96/98/EC on marine equipment (4th Amendment) Annex 2, A2/2.1-

On board NOx monitoring and recording devices, MARPOL 73/78 Annex VI regulation 13 and the NOx Technical Code

ATEX

Certificate Number: Baseefa05ATEX0082X

Type of Protection: Flameproof

Marking: II 2 G Ex d IIB T6 (tamb <40°C)

Marking: II 2 G Ex d IIB T4 (tamb <60°C)

IEC

Certificate Number: IECEx BAS 05.0030X

Type of Protection: Flameproof

Marking: Ex d IIB T6 (tamb <40°C)

Marking: Ex d IIB T4 (tamb <60°C)

T4 option is more likely to be relevant

International Association of Classification Societies

Concerning Electrical Installations – IACS E10 Test Specification for Type Approval and relevant IEC 60945

American Bureau of Shipping (ABS)

Certificate of Design Assessment SO_2/CO_2 Ratio NOx Technical Code

EC Type Examination Certificate NOx, SO_2 Monitoring

Certificate of Manufacturing Assessment

Quality Assessment Certificate

MCERTS

MCERTS Performance Standards for Continuous Emission Monitoring Systems

Product Conformity Certificate No: Sira MC 050060

Procal 2000 Maritime Emissions Monitoring Systems

Procal	Application	Measuring	Air Pollution Regulations
2100	Exhaust Gas Scrubber Monitoring	SO_2, CO_2 (to <0.1% sulphur-in-fuel equivalence)	MARPOL Annex VI regulation 14 MARPOL Annex VI regulation 4
2200	NOx Technical Code Direct Measurement and Monitoring	NOx CO_2	MARPOL Annex VI regulation 13
2300	Emission Control Area (ECA) Compliance	SO_2, CO_2 (All ECAs) NOx (USA ECAs)	MARPOL Annex VI regulation 14 MARPOL Annex VI regulation 13
2400 (with ATEX/IEC and O2 options)	Offshore Rigs	NOx, CO_2, CO Total Hydrocarbons	MARPOL Annex VI regulation 13 EC Integrated Pollution Prevention Control (IPPC) Directive

7-3217-02

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