

XEAMOS

Clean Air Engineering



Introduction



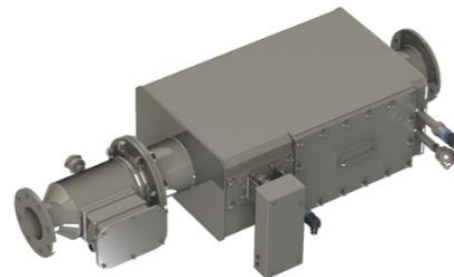
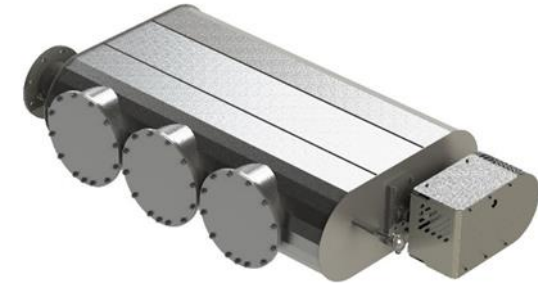
XEAMOS

Clean Air Engineering

Since 2017, Solfic & NPS Diesel form a joint venture: Xeamos

Exhaust After Treatment Systems

- Zero Soot System with Electrical Heater
- Zero Soot System with Fuel Burner
- Zero NOx System
- Dual Exhaust After Treatment System
- Customized solutions for 'Main' and 'Auxiliary' engines
- Wet Exhaust Systems





XEAMOS

Clean Air Engineering

To reduce the harmfulness of NOx and Soot, many (inter)national governing bodies have developed regulations to minimize emissions.

INTERNATIONAL

IMO Tier III



CONTINENTAL

EU Stage 5



NATIONAL

e.g. BEMS

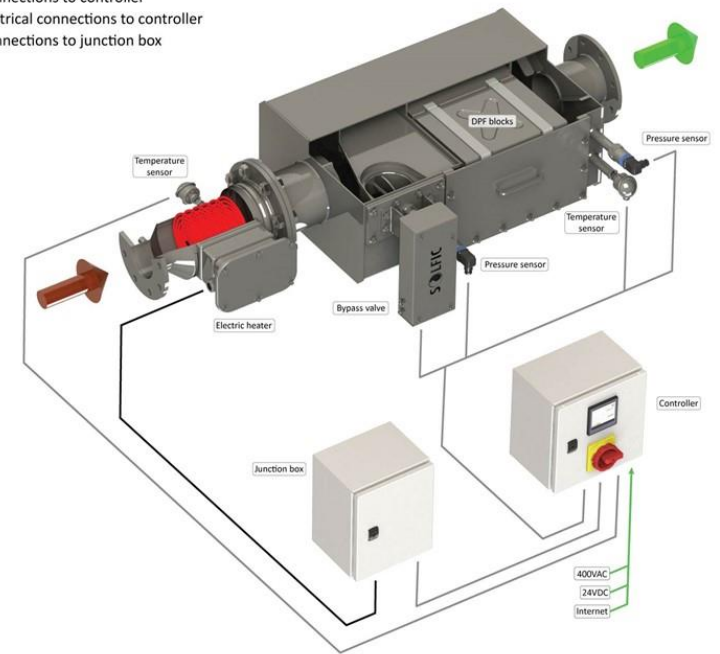


Electrical Zero Soot System (PM (measured as PM 10) > 97% reduction)

- Available up to 400 kW engine
- Active regeneration by electric heater
- Integrated bypass
- Load bank function
- Approx. 25 dB(A) noise attenuation
- “Harbour mode” for optimized reduction of HC

Legend

- Electrical connections to controller
- External electrical connections to controller
- Electrical connections to junction box

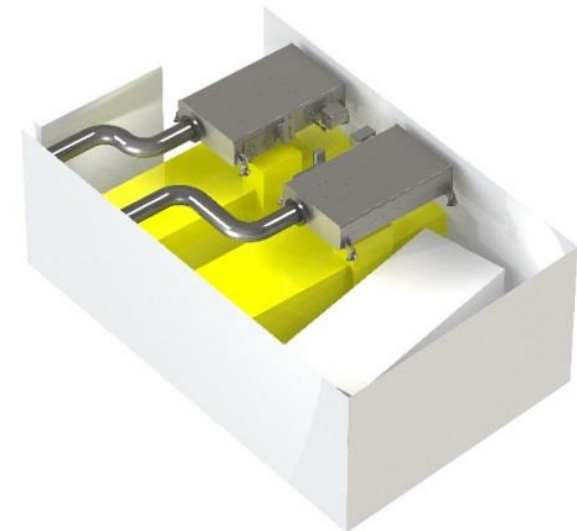
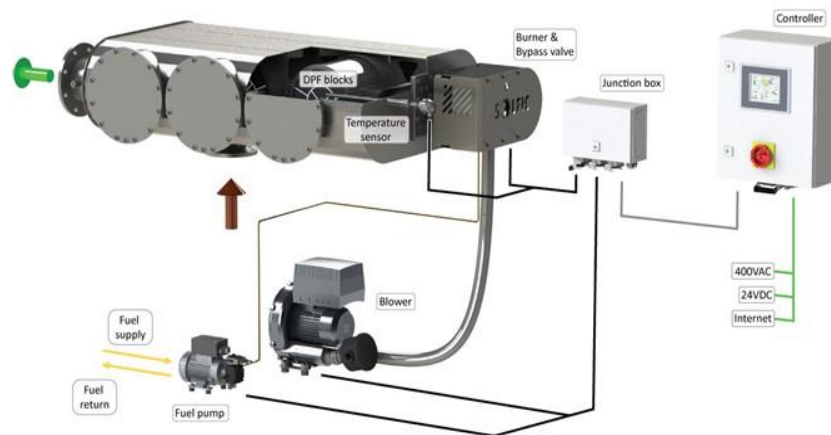


Fuel burner Zero Soot System (PM (measured as PM 10) > 97% reduction)

- Compact design
- Active regeneration by fuel burner
- Integrated bypass
- Lloyd's Register approved
- Approx. 30 dB(A) noise attenuation
- "Harbour mode" for optimized reduction of HC

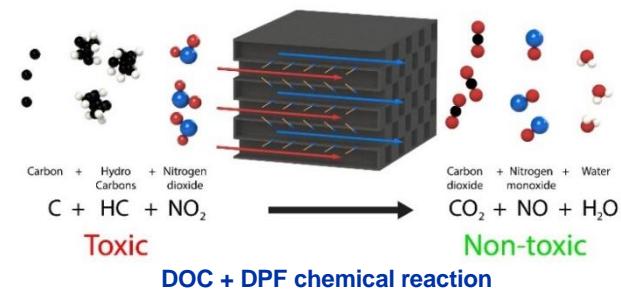
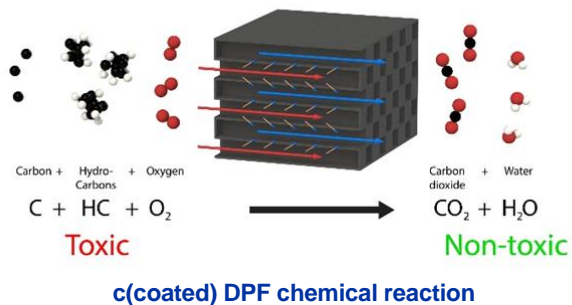
Legend

- Electrical connections to controller
- External electrical connections to controller
- Electrical connections to junction box
- Fuel



Diesel Particle Filter (soot filter)

- PM (measured as PM 10) > 97% reduction
- HC/CO up to 80% reduction
- Catalytic coating accelerates regeneration of collected soot at temperatures < 600° C



- * Balance temperature depends on actual soot composition and loading
- ** HC reduction increases with more aggressive coating

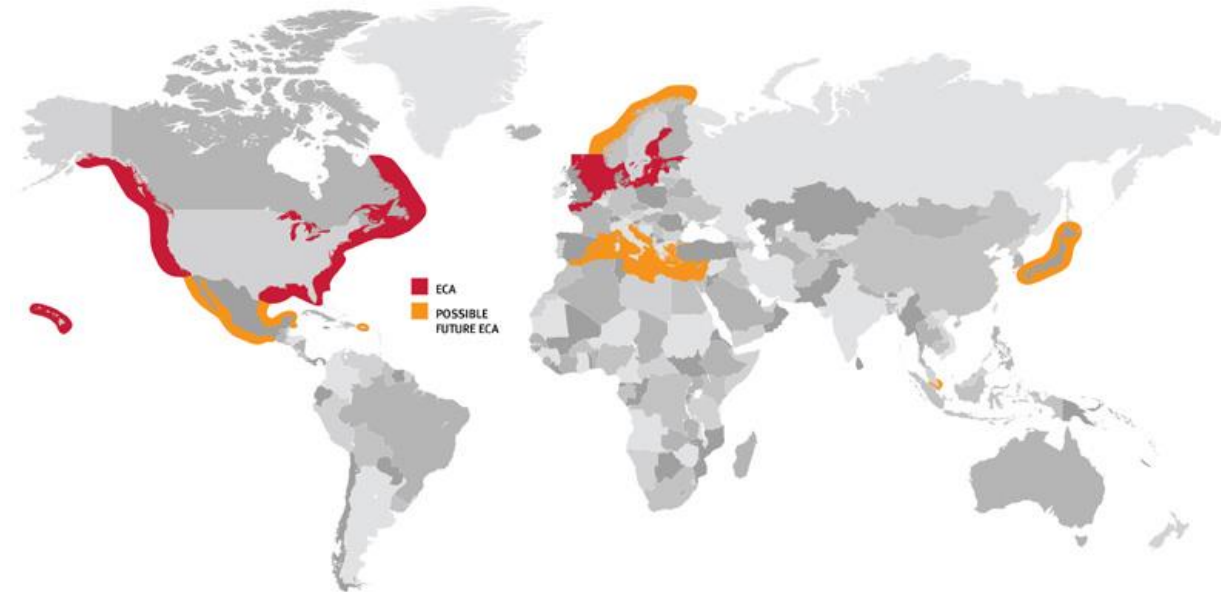
An underwater photograph featuring two individuals. In the foreground, a man with a beard and dark hair wears large, dark-tinted goggles. His hand is extended towards the camera, with fingers slightly spread. In the background, a woman with blonde hair wears yellow-rimmed goggles and smiles. The water is clear blue with some bubbles and light filtering through. In the top right corner, there are three horizontal yellow bars.

XEAMOS

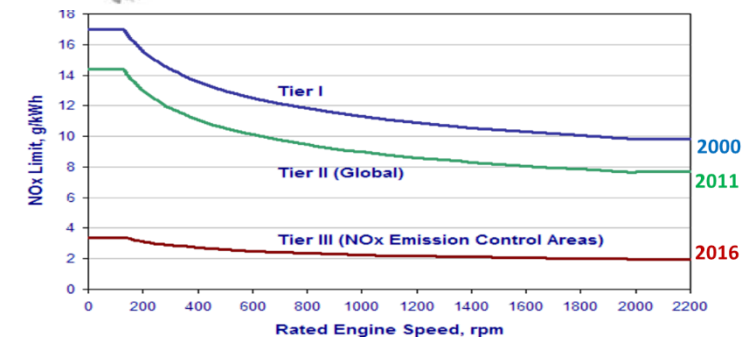
Clean Air Engineering

IMO Tier III legislation

United Nations | International Maritime Organization

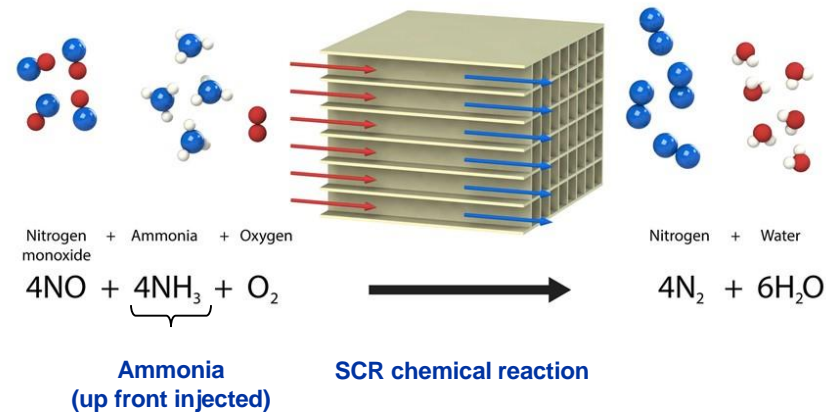


- As from 1-1-2016 North America and the Caribbean are ECA's
- Baltic and North Sea: Discussed NECA
- Applies to engines > 130 kWm
- Exemption MY < 500 GT till 2021, or < 24mtr
- Keel laying after 1-1-2016 or major conversion (Refit)



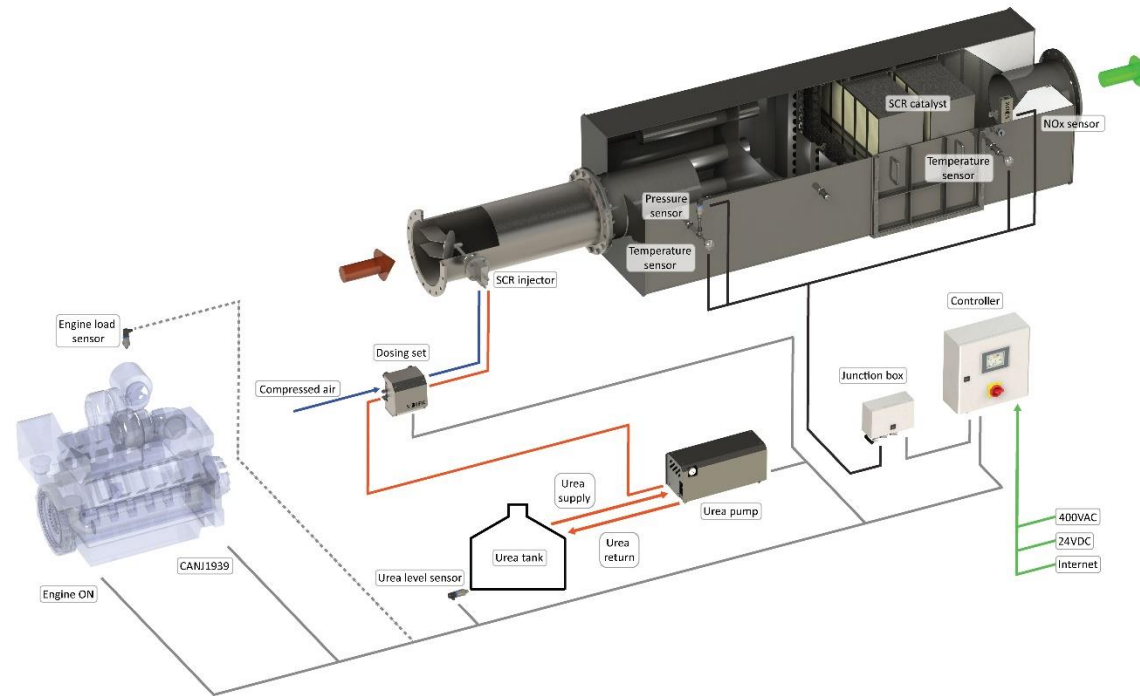
Selective Catalytic Reduction (deNOx)

- NOx – Nitrogen oxides >80 - 90% reduction
- Applicable with different fuel types (EN590, MGO, MDO, LNG, DMA and DMX)
- Urea / ureum injection required for chemical reaction



Zero NOx System (SCR-DeNOx) (NOx – Nitrogen oxides* >80 - 90% reduction)

- Approx. 35 dB(A) noise attenuation
- Lloyd's Register approved
- Compact design
- Remote access via LAN



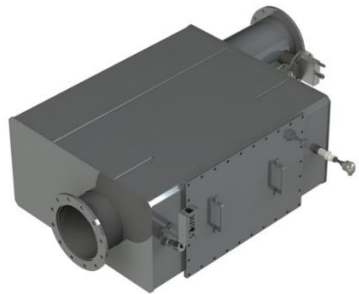
Legend

- Electrical connections to controller
- External electrical connections to controller
- Electrical connections to junction box
- Urea
- Compressed air

Zero NOx System (NOx – Nitrogen oxides >80 - 90% reduction)

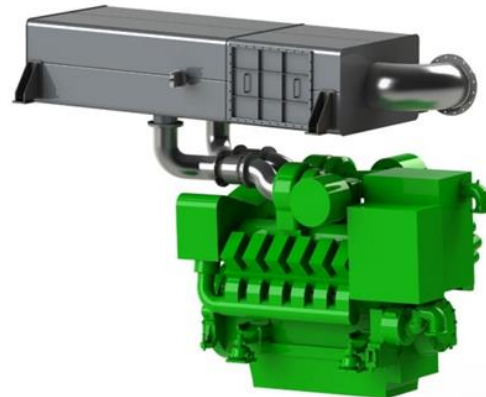
Compact

- Shortest installation length
- Integrated mixing tube
- Approx. 20 dB(A) noise attenuation



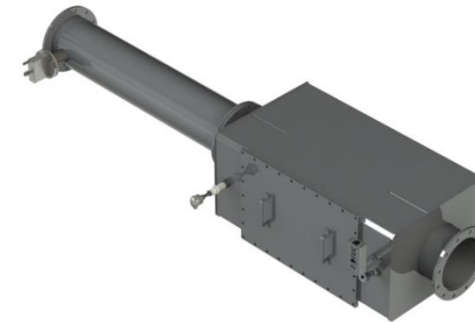
Custom made

- Flexible design
- Exchange for silencer (refit)



Standard

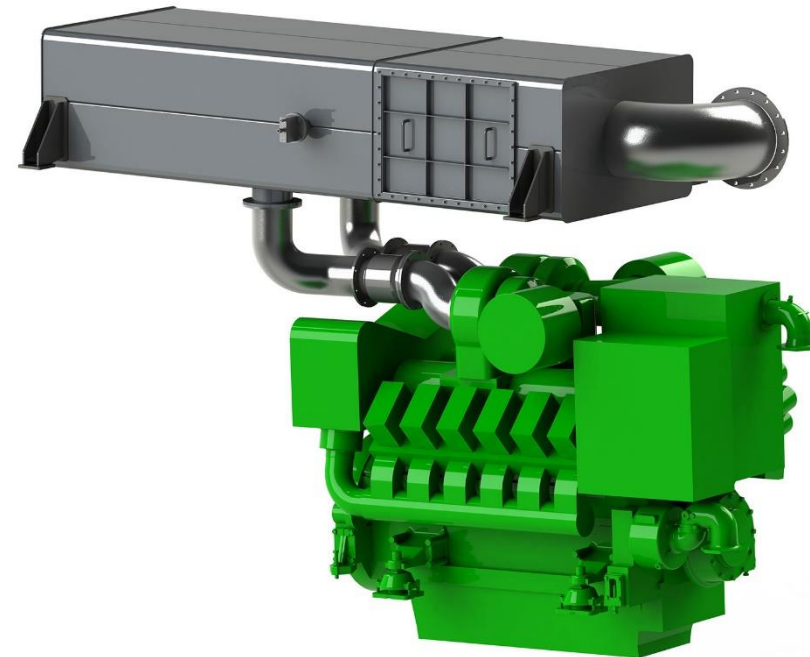
- Separate mixing tube for flexible installation
- Approx. 10 dB(A) noise attenuation



Custom made Zero NOx System (SCR-DeNOx)

(NOx – Nitrogen oxides >80 - 90% reduction)

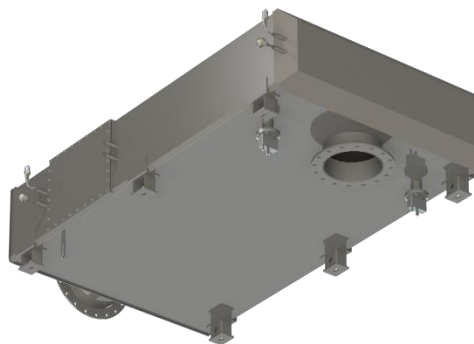
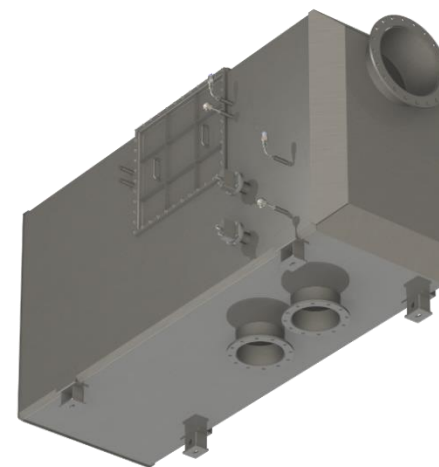
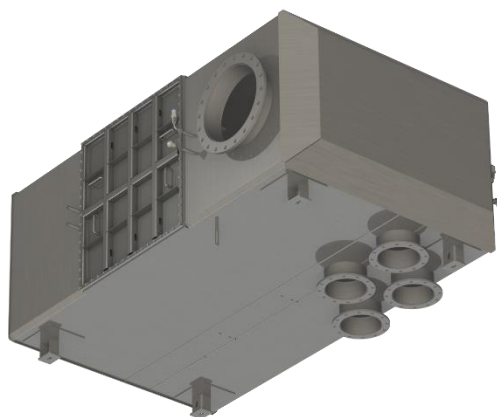
- Lloyd's Register approved
- Design variations:
 - Inlet / outlet positions
 - Noise attenuation
 - Unit weight
 - Housing materials
 - Design parameters like special forces, temperatures, backpressures, etc.



XEAMOS



Customised Zero NOx Systems 'IMO tier III' approved



BEMS

National government (NL) | Rijksinstituut voor Volksgezondheid en Milieu



■ 'Besluit Emissie-eisen Middelgrote Stookinstallaties'

■ Since 2010

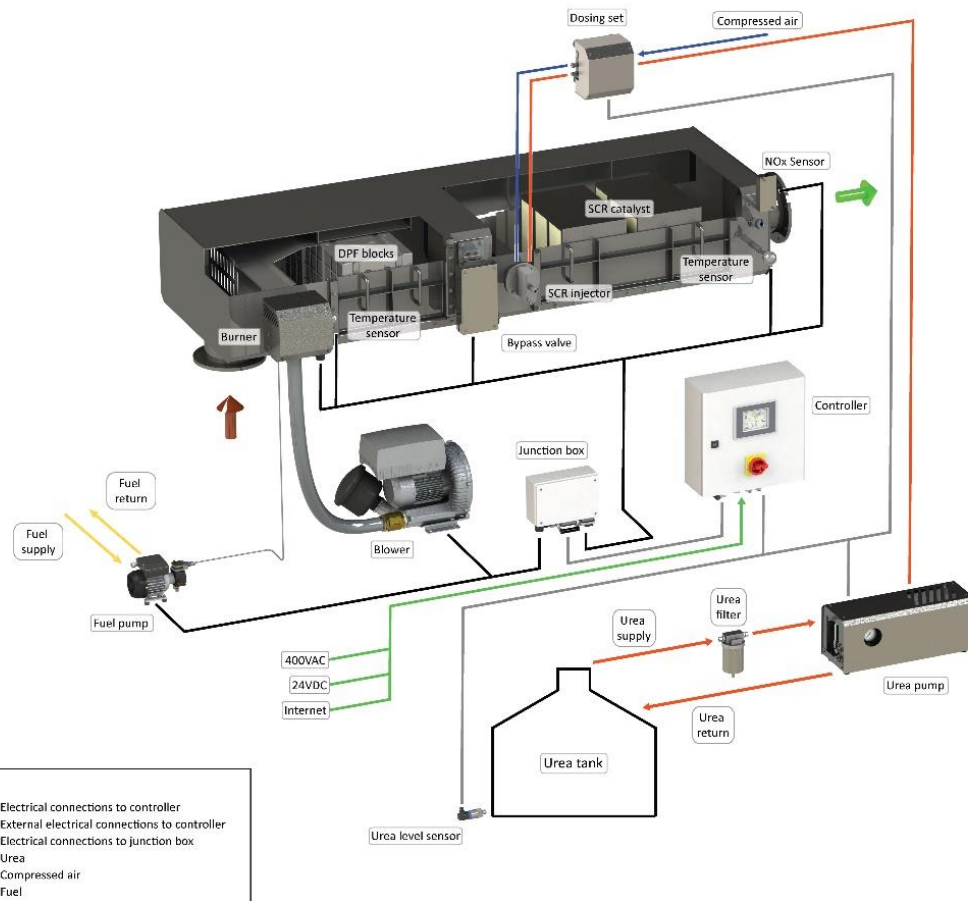
■ Local councils monitor compliance



XEAMOS

Clean Air Engineering

Dual Exhaust After Treatment System

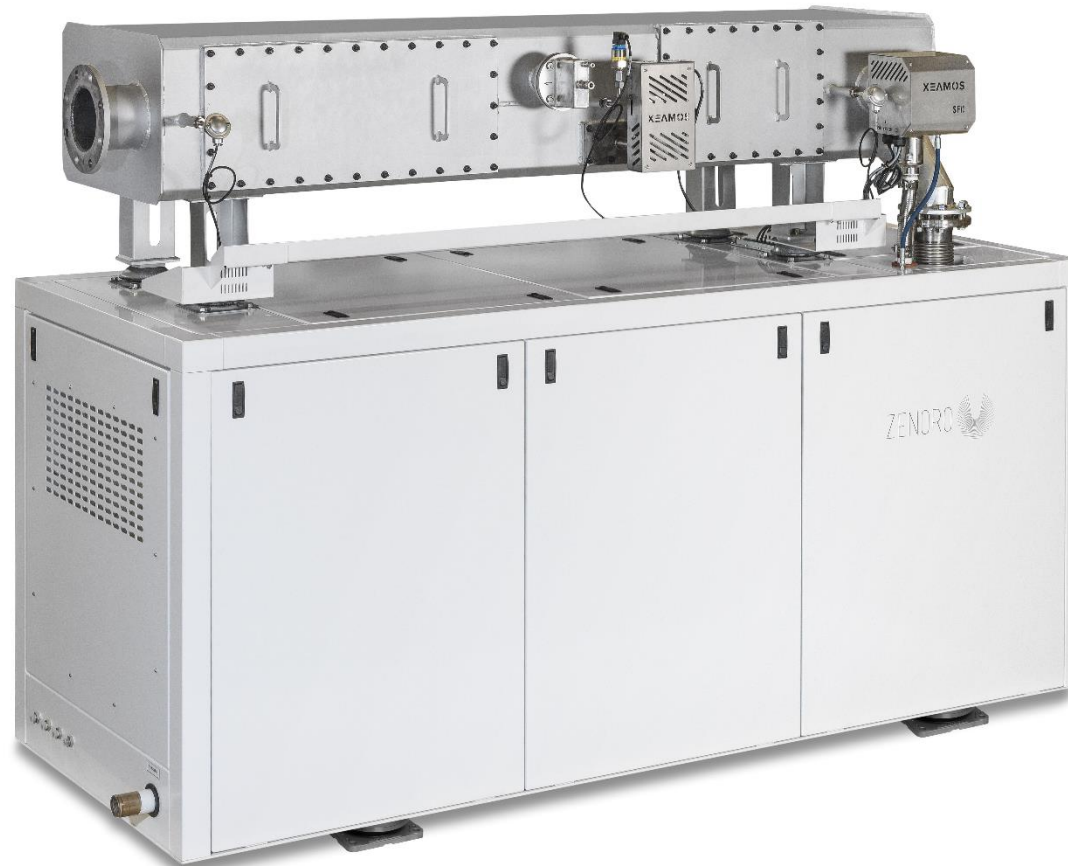


- Compact design combined SCR and DPF
- Active regeneration by fuel burner or electrical heater
- Execution with Coated DPF
- Fuel quality, up to 2000 ppm sulfur
- Integrated bypass
- Approx. 45 dB(A) noise attenuation
- One urea pump and controller for multiple sets



XEAMOS

Dual Exhaust After Treatment System



EU STAGE V

European Union | European Commission

- European legislation
- Reducing particles (soot) as NOx
- Non Road Mobile Machinery

Stage V emission standards for engines in inland waterway vessels (IWP & IWA)

Category	Net Power	Date	CO	HC ^a	NOx	PM	PN
	kW						
IWP/IWA-v/c-1	19 ≤ P < 75	2019	5.00	4.70 ^b		0.30	-
IWP/IWA-v/c-2	75 ≤ P < 130	2019	5.00	5.40 ^b		0.14	-
IWP/IWA-v/c-3	130 ≤ P < 300	2019	3.50	1.00	2.10	0.10	-
IWP/IWA-v/c-4	P ≥ 300	2020	3.50	0.19	1.80	0.015	1×10 ¹²

^a A = 6.00 for gas engines

^b HC + NOx

Engine Type	Equipment Category	Explanation
1. NRE	Other non-road mobile machinery	(a) Engines for non-road mobile machinery intended and suited to move, or to be moved by road, and are not included in any other category set out in points (2) to (10). (b) Engines with a reference power of less than 560 kW used in place of engines of categories IWP, RLL or RLR.
2. NRG	Generating sets	Engines greater than 560 kW exclusively used in generating sets.
3. NRSh	Equipment with SI engines	Spark-ignition (SI) engines less than 19 kW exclusively used in hand-held machinery.
4. NRS		SI engines less than 56 kW and not included in category NRSh.
5. IWP	Inland waterway vessels	Engines greater than or equal to 37 kW exclusively used in inland waterway vessels, for their propulsion or intended for their propulsion.
6. IWA		Engines greater than 560 kW exclusively used in inland waterway vessels, for auxiliary purpose or intended for auxiliary purpose.
7. RLL	Railway	Engines exclusively used in locomotives, for their propulsion or intended for their propulsion.
8. RLR		Engines exclusively used in rail cars, for their propulsion or intended for their propulsion.
9. SMB	Snowmobiles	SI engines exclusively used in snowmobiles.
10. ATS	ATVs and SbS	SI engines exclusively used in all terrain and side-by-side vehicles (ATVs and SbS).

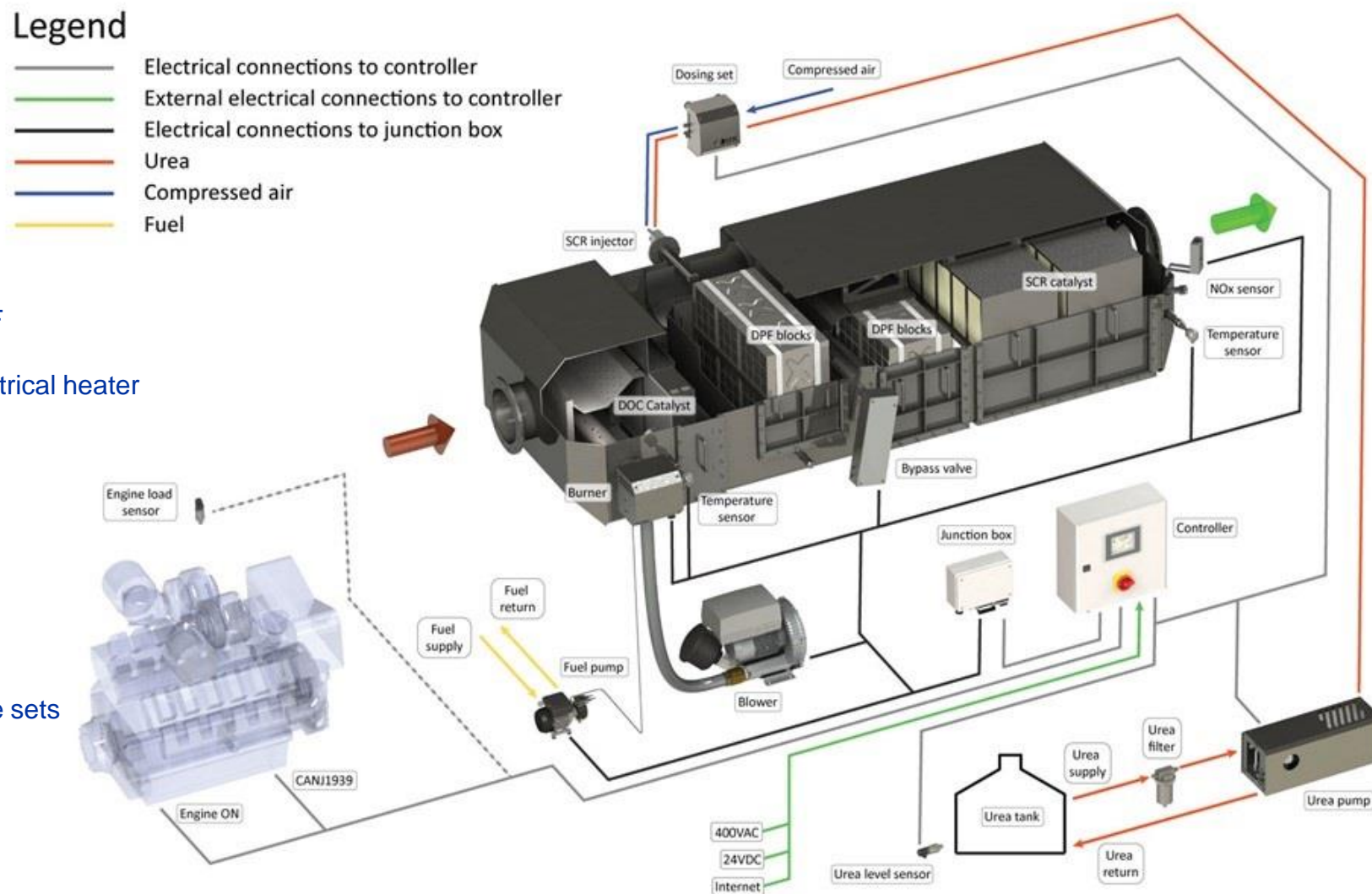


XEAMOS

Clean Air Engineering

Marine Propulsion Aftertreatment System

- Compact design combined SCR and DPF
- Active regeneration by fuel burner or electrical heater
- Execution with DOC
- Fuel quality, up to 50 ppm sulfur
- Integrated bypass
- Approx. 45 dB(A) noise attenuation
- One urea pump and controller for multiple sets



XEAMOS

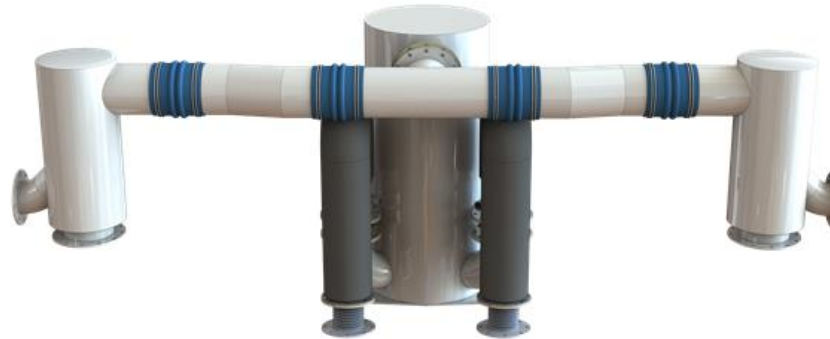
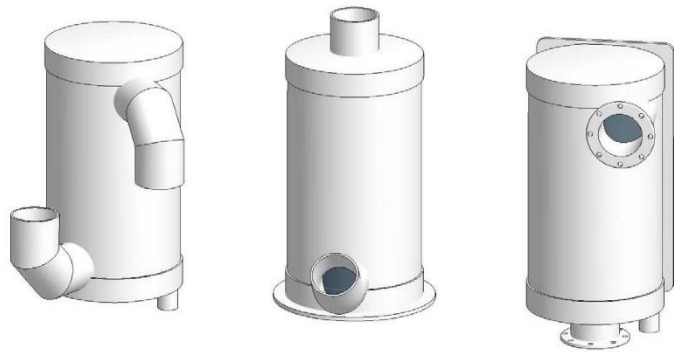
Service network

- Service engineers Expertise in working with our brands.
- Worldwide Service & Sales network



Wet exhaust systems

- Dry silencers (Carbon steel / Stainless Steel)
- Water injectors
- GRP Water lifts, Separators, Water locks etc.
- Bellows, Compensators, Valves
- Design (Drawings, Backpressure calculations, Noise requirements calculations)



A large white ship is sailing on a deep blue sea. The ship's hull is white, and its bow is prominent. In the background, there are steep, rocky cliffs under a bright blue sky with scattered white clouds. The water is dark blue with white foam from the ship's wake.

XEAMOS

Clean Air Engineering