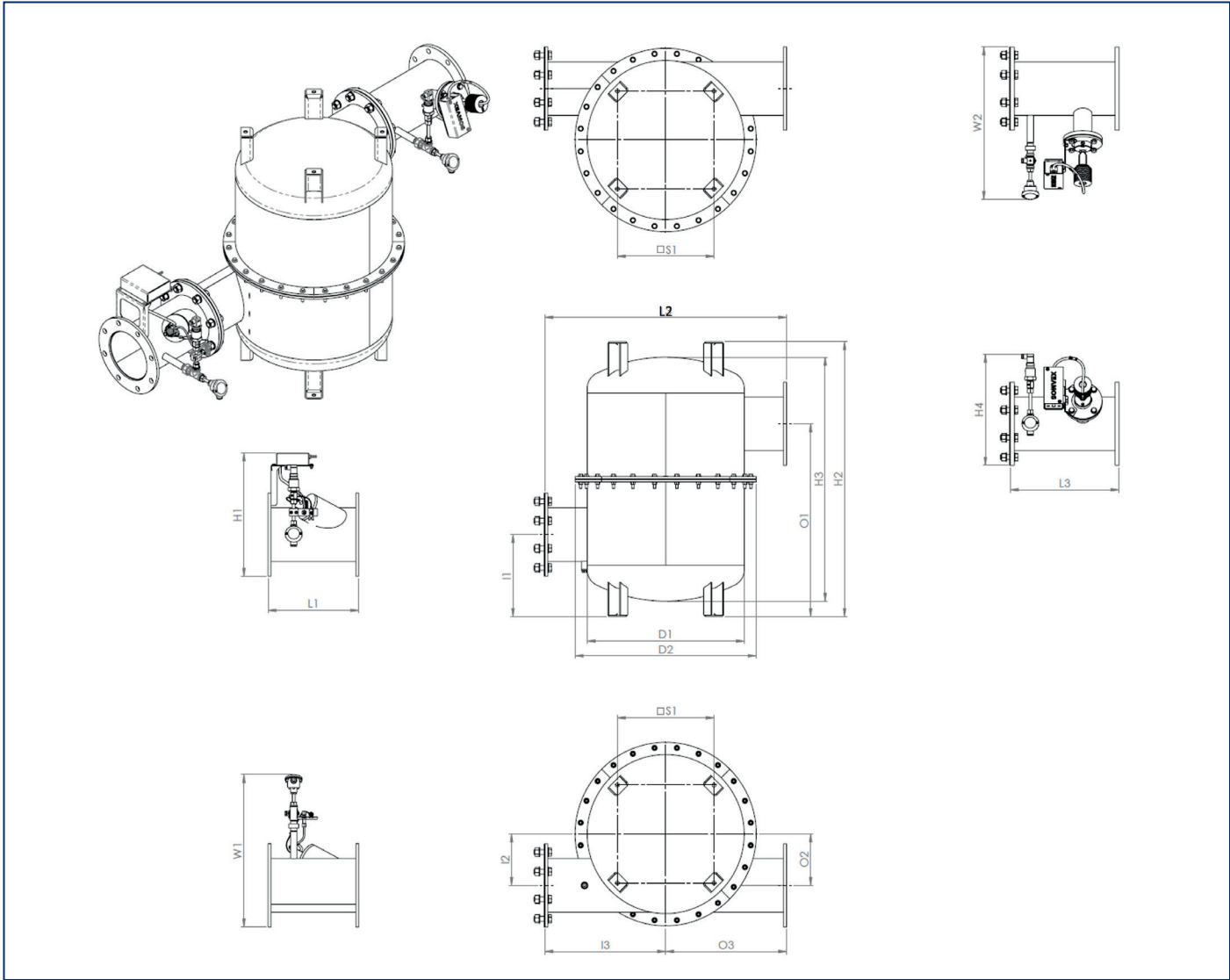


IMO III modular SCR unit size Table

System type	Flange EN1092 PN10		W1	W2	L1	L2	L3	H1	H2 *	H3*	H4	I1	I2	I3	O1	O2	O3	S1	D1	D2	Weight unit**	Weight mixing tube	Weight sensor tube	Weight total
	In	Out	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	kg	kg	kg	kg
ZN-RB-M-30	DN150	DN150	570	570	375	950	450	451	1000	834	427	310	160	500	690	160	450	315	500	600	135	20	30	185
ZN-RB-M-40	DN150	DN150	570	570	375	950	450	451	1180	1014	427	480	160	500	870	160	450	315	500	600	160	20	30	210
ZN-RB-M-60	DN200	DN200	623	623	375	1000	450	504	1123	997	454	335	210	500	788	210	500	400	650	750	195	25	30	250
ZN-RB-M-90	DN200	DN250	623	694	375	1200	450	504	1280	1154	482	450	210	650	933	n.a.	550	400	650	750	250	25	35	310
ZN-RB-M-115	DN250	DN300	676	744	375	1300	450	564	1350	1262	524	460	260	700	966	n.a.	600	500	800	900	320	30	40	390

* H2/H3 : with (optional) internal damper section height is +500mm. ** Weight of standard unit.

Drawing standard Zero NOx-RB system



Note: This drawing is preliminary & provided for reference only and is not intended for installation purpose. Contact Xeamos, or your local distributor for detailed information

XEAMOS
Bijsterhuizen 2209 | 6604 LC Wijchen | The Netherlands
+31(0)246 486 015 | info@xeamos.com

xeamos.com

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Edition 2024-04
Zero NOx- RB

Zero NOx-RB

Reducing emissions together



Zero NOx-RB

Xeamos solution for IMO Tier III solutions for marine engines < 850kW (propulsion and auxiliary)

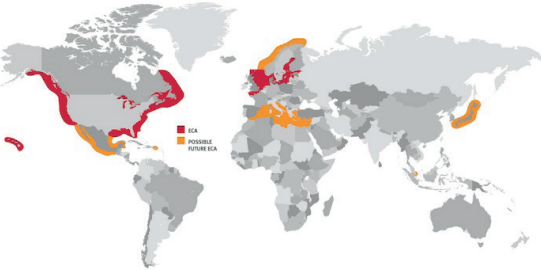
With all eyes focussed on the new Emission Control Area's that has come into force since January 2021, Xeamos has developed an innovative and modular solution for SCR DeNox systems for marine applications. These systems have been based on our extensive experience since the first system was installed in 2011. Currently, Xeamos systems convert almost a 1.9 million kilograms of NOx to harmless nitrogen each year. A compact, light weight SCR system without requirement for compressed air.

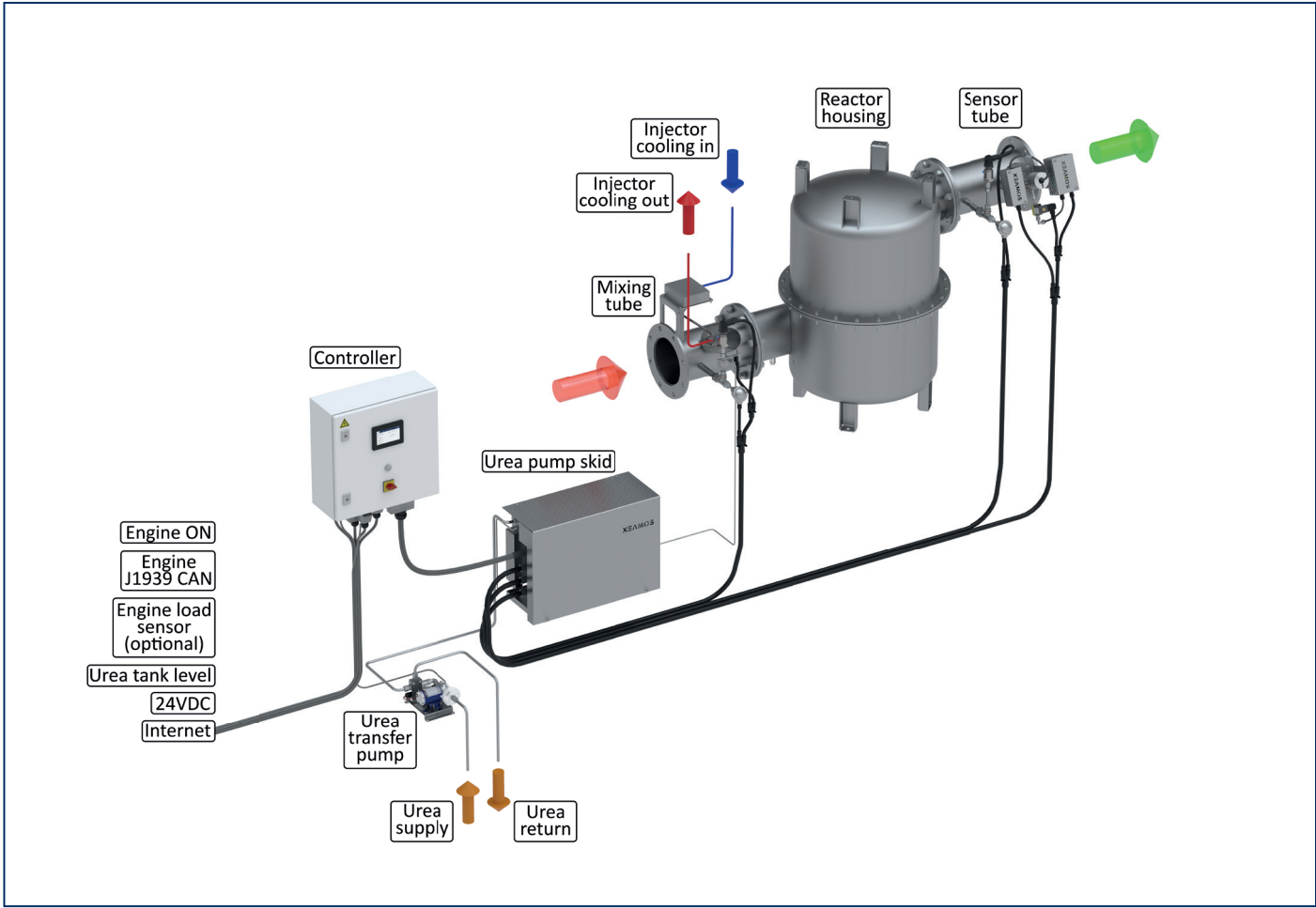
With [Xeamos SCR systems](#) any diesel engine can comply with the [IMO Tier III NOx](#) emission standard, or even better.

- More than 3.000.000 hrs of experience in exhaust emission reduction in the maritime industry.
- Extensive experience with IMO III certification procedures. Holder of multiple certificates.
- [Zero NOx-RB](#) systems can be applied in wet and dry exhaust systems, even at high back pressures.
- The Zero NOx unit can be mounted in any orientation and high exhaust gas temperature up to 600°C with multiple mounting points. Outlet can be fully rotated 360 degrees with steps of 11.25 or 15 degrees, (depending on system type), all for optimal integration in existing or future exhaust systems.
- Intelligent PLC control ensures trouble free operation.
- Integrated sound attenuation. Optional extra sound attenuation.

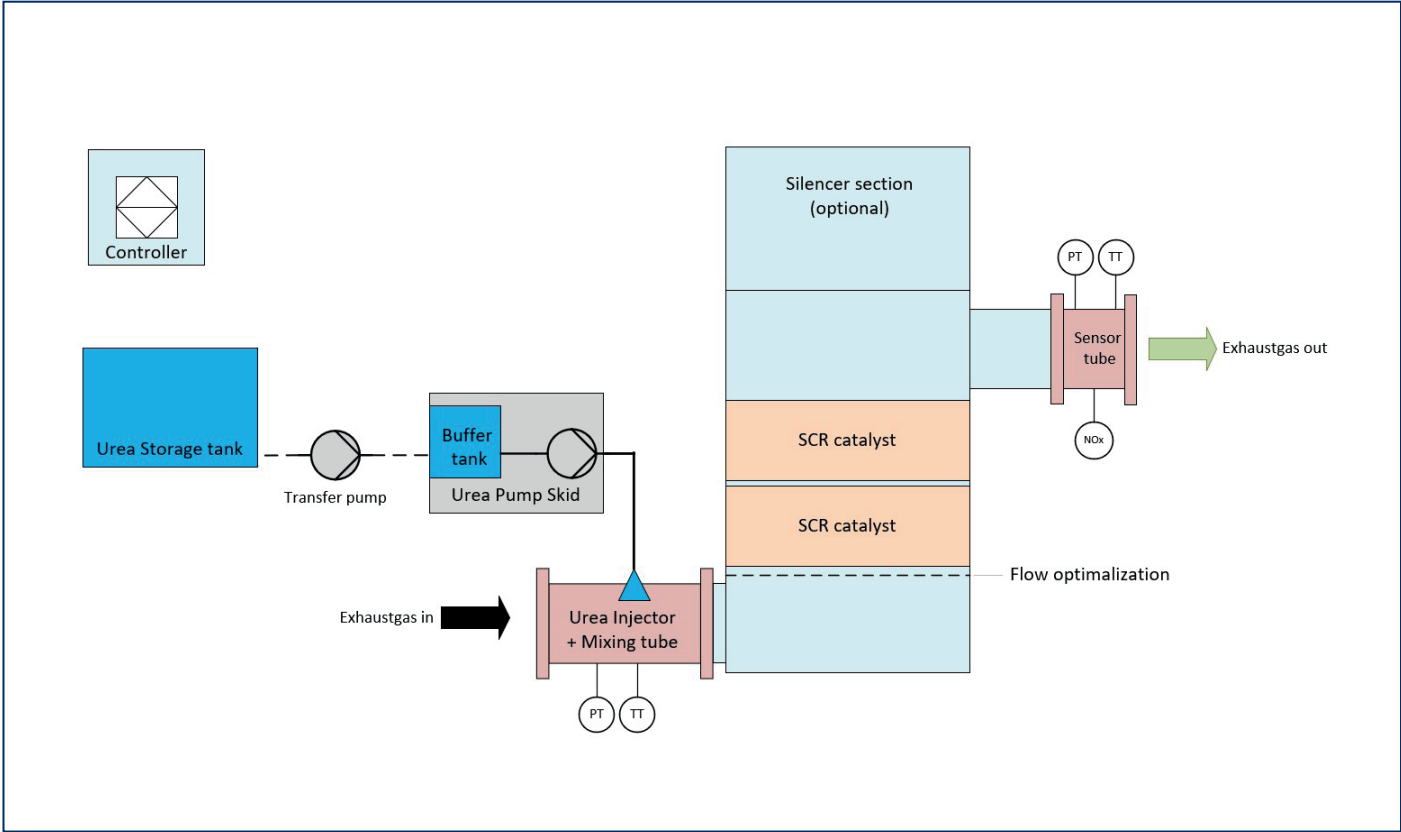
Main Features

- Intelligent modular design
- Easy integration in small engine rooms, various mounting options
- New generation airless urea injection
- Integrated silencer
- Designed for harsh marine environments
- CFD and FEM aided design
- Suitable for EN590 and fuels with Sulphur content <1000ppm
- For up to 600°C exhaustgas temperature
- Full stainless steel housing
- SCR catalytic elements are exchangeable
- Various thermal insulation options
- Remote service option





Lay-out van het Zero NOx-RB system.



Principe schema van het Zero NOx-RB systeem.

Operational conditions

Application	LS/ULSF, MGO, MDO
Ambient Temperature	-20 + 50°C
Degree of Protection	IP55
Relative humidity	5 to 95% Non-condensing
Service	Approx. 1x per year (normal conditions)
Urea specification	AUS32 or AUS40 or equivalent

Utilities

Power supply	24VDC 16A (single system) 20A (double system)
Cool water for urea injector	50l/h @ max. 110 °C. (from engine cooling circuit)

Specifications

Materials Reactor	Housing: Stainless Steel Mixing tube: Stainless Steel
Surface treatment	sensor tube no treatment, stainless steel pearl blasted
Max system pressure	200mbar @550°C. For higher pressure please consult Xeamos
Pressure drop (ΔP)	30-50 mbar system dependant, see table at right bottom of this page
Emission reduction	IMO Tier III limit or better (up to 0.4g/kWh)
Operational temperature	>230°C (EN590 fuel)
Control strategy	Open or closed loop with NOx sensor
Supports	Standard
Thermal insulation	Optional

Legal requirements and standards

Standards	EMC directive 2014/30/EU Machinery directive 2006/42/EC Low voltage directive 2014/35/EU Classification Lloyds Register
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System parts

Controller	PLC with full colour HMI, marine standard (Lloyds Register Ship Approval) One single controller cabinet is applied for up to 2 Zero NOX-RB systems per engine room - Inputs: Engine RUNNING, CANJ1939, Engine load sensor, Urea tank level - Outputs: System ON, Alarm, MOD bus - Data logging - Remote access (optional)
Reactor Housing Urea pump skid	Flexible orientation of outlet Urea Pump module Buffer tank Urea quality sensor
Sensor tube	1x temperature, 1x pressure transmitter & 1x NOx out
Wiring	Wiring harness between Controller and Urea Pump skid included (5m standard, 10m option) Wiring harness between Urea Pump skid and field components included
Mixing tube	1x temperature, 1x pressure transmitter, 1x airless urea injector
Loose supply	Urea transfer pump

Performance

NOx - Nitrogen oxides	75 - 80% reduction
Sound attenuation	20 dB(A) or 30 dB(A) optional

Emission standards

The IMO NOx Tier III emission standards are effective in the NECA areas since January 1st 2016. This means that all vessels with a length of ≥24 metres, have to comply with the IMO Tier III emission rules. These NOx emission requirements are laid down in the MARPOL (73/78) Annex VI regulation 13 (2008). From January 1st 2016 the IMO NOx Tier III emission standards is effective in the North American and US Caribbean Nitrogen Emission (NECAs). Besides that, the IMO has adopted the designation of the Baltic Sea and the North Sea as an emission control area for nitrogen oxides (NECA) for ships with keel-laying on or after 1 January 2021; this was decided during the 71th session of the IMO Marine Environment Protection Committee (MEPC 71). All this means that engines on board above 130 kW are not allowed to emit more than approx. 2 g/kWh NOx (high speed engines). This means a 75% reduction of NOx compared to the IMO Tier II standard. With diesel engines this emission level can only be reached by fitting an SCR system.

Certification

Xeamos has extensive experience with IMO Tier III certification and holds various IMO III certificates. Please contact Xeamos for more information.

Optional

- Remote access via LAN accessible for diagnostics/remote Services
- NOx sample unit for sulphur containing fuels
- Single controller for each system in case of two engines

System selection

To configure your system we kindly ask you to submit the following information.

Engine model and power	kW
Maximum exhaust gas flow	kg/h
Engine certification	IMO II / n.c./ ...
Exhaust system	wet / dry
Available	backpressure mbar
Application	propulsion/auxiliary generator
Cycle according ISO8178	E2/E3/D2/C1
Emmission	dat at determined load steps
Running hours per year	hours
Average engine load	%
Fuel type	EN590, DMA etc (specify max. sulphur content)

IMO III modular SCR unit selection Table

System type	Max. exhaust-gas flow kg/h	Reference engine power* kW	Pressure drop @ 100% load** mbar
ZN-RB-M-30	1180	200	~30
ZN-RB-M-40	1770	320	~50
ZN-RB-M-60	2400	430	~30
ZN-RB-M-90	3600	650	~50
ZN-RB-M-115	4400	750	~50

* Applicable for IMO Tier III emission limit
** Selection table is applicable for Tier II to TIER III reduction