



# The PureNOx Compliance Service Package

The easy way to stay assured

# One package with all that you need

- For compliance
- For economy
- For peace of mind

## What you get and when

The PureNOx Compliance Service Package covers a full five-year compliance cycle. It begins with a start bundle, which includes a Condition Audit and Performance Audit if your PureNOx LS system has been operating for more than one year. During each year that follows, you receive a dedicated service bundle that's matched to your system's current needs.

Right on schedule, you get everything required to ensure continuous uptime from PureNOx LS, along with a number of options.



## PureNOx Compliance Service Package

	Kits	Support		Crew training		Exchange	Eco EGR	Onboard service			
	Module service kit or spare parts kit	Regulation monitoring	24/7 Service & Support	Online training material	Onboard training (hands-on)	Sensor exchange programme	Support for continuous operation	OCM service	Certified calibration	Condition Audit	Performance Audit
<b>Included in PureNOx LS system delivery (prior to the Compliance Service Package)</b>											
<b>Start bundle (if &lt;1 year of operation)</b>	Emergency spare parts kit*		•								
<b>Start bundle (if ≥1 year of operation)</b>	Emergency spare parts kit*				•			•	•*	•	•
<b>Year 1 bundle</b>	Module service kit	•	•	•		•*	•*				
<b>Year 2 bundle</b>	Module service kit	•	•	•		•*	•*				
<b>Year 3 bundle</b>	Module service kit	•	•	•	•	•*	•*	•		•	•
<b>Year 4 bundle</b>	Module service kit	•	•	•		•*	•*				
<b>Year 5 bundle</b>	Module service kit	•	•	•	•	•*	•*	•	•	•	•

Each year of the PureNOx Compliance Service Package includes a module service kit for performing preventive maintenance. The contents of the kit vary from year to year, as determined by your system's annual, semi-annual, biannual and triannual service needs. Please see the following pages for details.

\* = Option

# The PureNOx Compliance Service Package

If your vessel uses Exhaust Gas Recirculation (EGR) to comply with the Tier III NOx standard, the EGR system must always be running when you sail in Tier III NOx Emission Control Areas (ECAs). That means it will accumulate bleed-off water, which is considered chemical waste and is costly to dispose of – if ports will accept it at all.

By continuously treating and discharging the EGR bleed-off water, Alfa Laval PureNOx LS protects your compliance and economy. You need to know it will work without fail, and we make that easy with the PureNOx Compliance Service Package.

## Compliance takes more than calibration

EGR regulations demand certified calibration of your water treatment system every five years. But many other actions are needed to secure Tier III NOx compliance in the time between. The following are all required to ensure continuous water treatment uptime:

- Annual maintenance according to maker recommendations
- Regular condition checks and inspections
- Crew training
- Certified calibration every fifth year

## Let us make compliance simple

With the PureNOx Compliance Service Package, we take charge of PureNOx LS care – which takes a burden off your shoulders. Over a five-year period of compliance, our experts supply everything you need to perform preventive maintenance, from service kits to training. We handle the timing, logistics and fifth-year calibration, plus the checks and inspections needed along the way. So you can be sure that it all goes right.

## Alfa Laval knowledge is always included

Since the rules concerning NOx are constantly developing, we also make sure that you stay informed. During all five years of the PureNOx Compliance Service Package, your superintendents and crews have access to our online training material. Likewise, you're subscribed to our newsletters and bulletins about exhaust gas regulations and NOx emissions. At all times, our experts are on call through Alfa Laval's 24/7 Service & Support.



# Correct maintenance, year by year

The preventive maintenance needs of your PureNOx LS separator module differ from year to year. That's why the service bundle for each year of the PureNOx Compliance Service Package contains a module service kit prepared by our experts. The kit provides a base of consumables and contents for semi-annual and annual maintenance, plus whatever you need when biannual or triannual maintenance is required.

## Module service kit contents

### Consumables

- **Inorganic coagulant**  
Treating the feed water with a coagulant improves separation within the PureNOx LS system. The coagulant encourages particles in the water to clump together, making them larger and easier to separate.
- **OCM cleaning kit**  
Manual cleaning of the oil content monitor (OCM) is needed to prevent false readings of high ppm. The kit provides everything required.

### Semi-annual maintenance

- **Intermediate service kit**  
Intermediate service should be performed on the PureNOx LS separator every six months. The service involves cleaning the bowl drive system, which is necessary to avoid the risk of unscheduled stops due to drive system failure.

### Annual maintenance

- **Major service kit**  
Major service should be performed on the PureNOx LS separator every 12 months. The service involves replacement of the main bearings, and the rotating system is inspected as well. Because the spindle turns at 8000 rpm, worn bearings will break, causing severe damage to the spindle, frame and bowl.

*NB! This service should be performed together with an intermediate service, as the kits do not contain the same items.*

- **Wiper ring**  
The wiper ring on the PureNOx LS automatic cleaning assembly should be replaced every 12 months to prevent it getting stuck. If sticking occurs, the PPM value will rise to the MAX setting and trigger an alarm, stopping all discharge overboard.

- **Sludge diaphragm kit**

The diaphragm of the PureNOx LS sludge pump should be exchanged every 12 months, especially if the pump stands dry for longer periods of time. If the diaphragm breaks, the pump will no longer work and the sludge tank will fill up. Once it becomes full, a high-level alarm will stop the system.

### Biannual maintenance

- **Valve and diaphragm kit for dosing pump**  
The PTFE diaphragm of the PureNOx LS dosing pump can lose its elasticity and resistance to chemicals. Defective, leaking valves can lead to inaccurate dosing or operational disruptions. Both items should be exchanged every two years.
- **Shaft seal kit for feed pump**  
The mechanical seal of the PureNOx LLS feed pump should be exchanged every two years. A well-functioning seal prevents the leakage of process fluids, which reduces day-to-day maintenance.

### Triannual maintenance

- **Frame feet service**  
The rubber parts of the PureNOx LS frame feet should be exchanged every three years. Because rubber hardens over time, older parts may no longer protect the separator from vibrations.
- **Bottom bearing holder**  
The PureNOx LS bottom bearing holder should be exchanged every three years. Over time, vibration, heat and normal operating conditions can cause the holder's tolerances to increase. When this happens, there is a risk of the bearing coming loose and being damaged, which could lead to a major separator breakdown.

*NB! This service is not applicable for PureNOx LS100.*







## Additional options

### Sensor exchange programme

For PureNOx LS systems equipped with the optional turbidity and PAH sensors, Alfa Laval's sensor exchange programme can simplify sensor calibration and minimize system down-time. When this option is chosen, a pre-calibrated measuring cell is sent to the vessel when calibration is due. Crew members perform the sensor exchange themselves, then send the old cell back to Alfa Laval for reconditioning and calibration. An official calibration certificate accompanies each measuring cell in the programme.

*NB! This exchange programme applies only to the turbidity and PAH sensors. Due to sensor differences, it cannot be used for the standard PureNOx LS OCM. The OCM calibration requires an onboard visit.*

### Eco EGR

In most cases, the EGR system that PureNOx LS is a part of runs only when the vessel is inside a Tier III NOx ECA. In these areas, the regulation of NOx emissions is much stricter than in Tier II ECAs. However, some engines are built for Eco EGR, which trims the combustion for reduced emissions and fuel savings of 3–5%.

In engines with Eco EGR, the EGR system is used whenever the engine is running. Because this demands continuous water treatment, we can adapt the PureNOx Compliance Service Package to cover the additional maintenance and consumables.

For more information about this service, please contact your local Alfa Laval office. Up-to-date contact details are always available at [www.alfalaval.com](http://www.alfalaval.com)



### **This is Alfa Laval**

Alfa Laval is active in the areas of Energy, Marine, and Food & Water, offering its expertise, products, and service to a wide range of industries in some 100 countries. The company is committed to optimizing processes, creating responsible growth, and driving progress – always going the extra mile to support customers in achieving their business goals and sustainability targets.

Alfa Laval's innovative technologies are dedicated to purifying, refining, and reusing materials, promoting more responsible use of natural resources. They contribute to improved energy efficiency and heat recovery, better water treatment, and reduced emissions. Thereby, Alfa Laval is not only accelerating success for its customers, but also for people and the planet. Making the world better, every day. It's all about *Advancing better™*.

### **How to contact Alfa Laval**

Contact details for all countries are continually updated on our web site. Please visit [www.alfalaval.com](http://www.alfalaval.com) to access the information.

