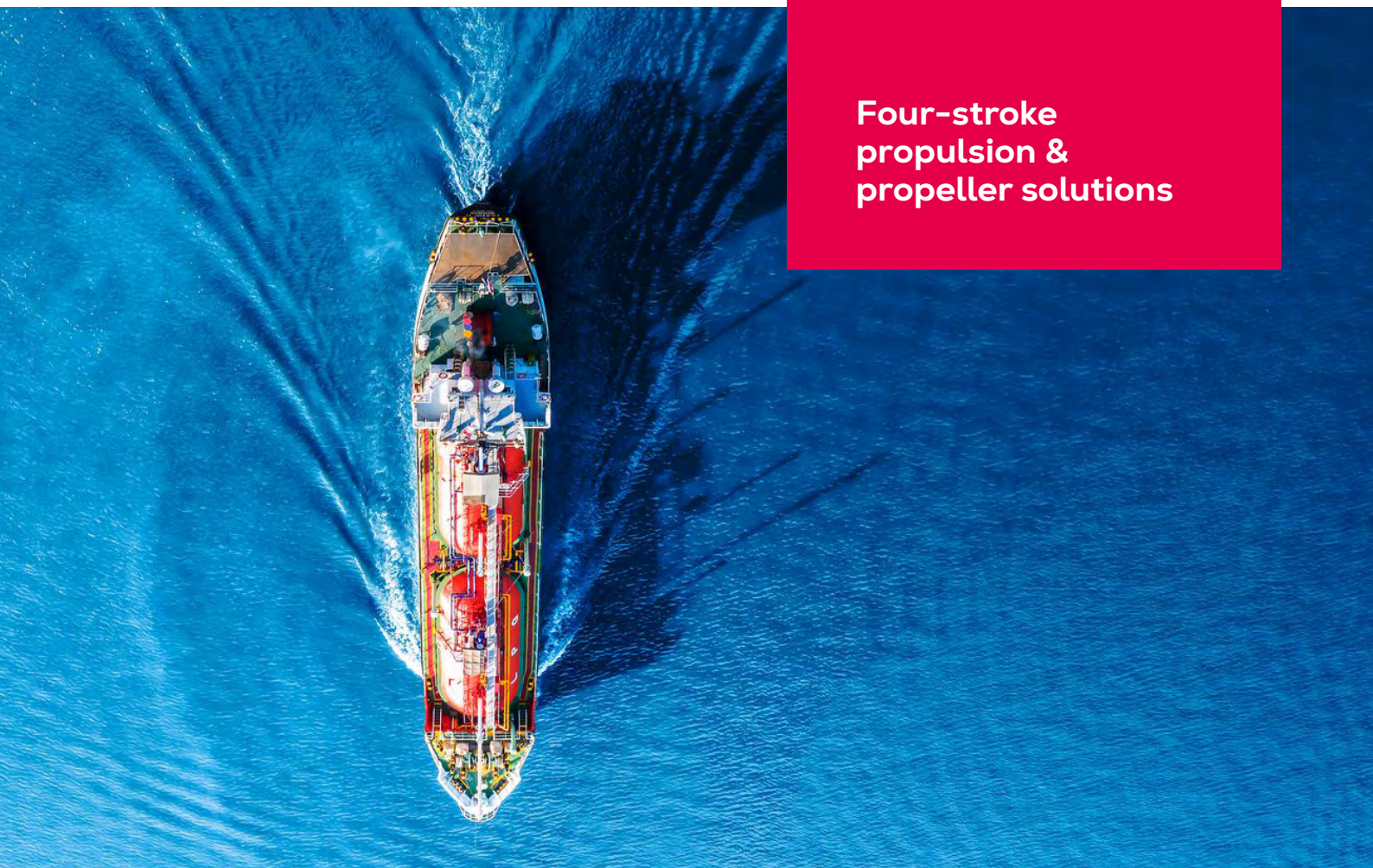
Everllence

PrimeServ

Retrofit & upgrade

Products services portfolio

Four-stroke propulsion & propeller solutions



Optimized **equipment**

Your partners for retrofit solutions

Reliability, greater efficiency and compliance with new environmental legislation are just some of the benefits our advanced retrofit solutions provide.

Keeping your equipment consistently up to date

Your existing four-stroke propulsion and propeller systems might be aging, but that does not mean they do not keep on delivering value. Our comprehensive, tailored retrofit solutions will keep your assets up to date through continuous development and modernization.

The Everllence PrimeServ retrofits and upgrades for four-stroke propulsion and propeller systems will help you improve efficiency, boost reliability and performance, save fuel and lubricating oil, while lowering maintenance costs and enabling a more flexible operation.

These retrofits and upgrades will also help you comply with increasingly stringent environmental regulations and help ensure your operations are on the road to energy transition and decarbonization. And they will benefit your employees by improving crew safety and making the equipment easier to operate.

So, whether you are looking to upgrade your existing four-stroke propulsion and propeller systems for improved reliability, fuel and lubricating oil savings, lower maintenance costs, or equipment upgrades, Everllence PrimeServ offers your vessels in service powerful retrofit solutions.

Black smoke **limitation package**

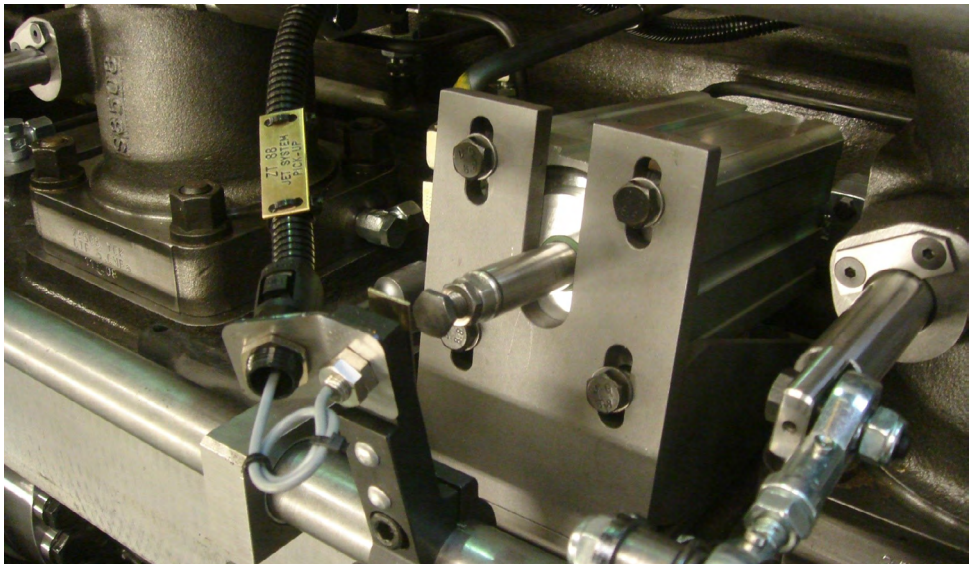
For engines with a mechanical governor configuration, Everllence has developed a solution for fuel index limitation to reduce black smoke. The solution will limit the fuel index during start-up and sudden load changes, thereby ensuring a balanced combustion and limiting the creation of black smoke.

The Black smoke limitation package consists of a fuel index limiter, a Lambda controller, and pipes and valves for the Jet-Assist. The charge air controls the Lambda controller, and as long as the charge air pressure is relatively low, the Lambda controller will decrease the fuel rack index and activate the Jet-Assist system.

The Jet-Assist system will apply compressed air to the compressor side of the turbocharger, and hereby accelerate the rotor and charge air pressure within a very short period.

An Everllence superintendent with expert knowledge is needed to install the Black smoke limitation package. If you have any maintenance planned in the near future, it would be beneficial to order the Black smoke limitation package and have the superintendent install it while already on board.

Please contact your Everllence PrimeServ office for more details.



Reduce black smoke with Everllence PrimeServ's solution package

Key benefits
- Order now, install when convenient
- Reduction of visible smoke during starting procedure
- Reduction of visible smoke in case of sudden load changes
- Less fouling of engine and exhaust gas system

Scope of supply
- Fitting of Lambda controller
- Fitting of start fuel limiter
- Fitting of parts required for Jet-Assist system
- Installation of electrical connection
- Adjustment of Lambda controller

Applicable to
Applicable for L27/38 propulsion engine types equipped with mechanical governors

Controllable pitch propeller optimization

Upgrade your CP propeller with the latest technology and hydrodynamic know-how. This provides a great fuel-saving, allowing your vessel to meet stricter emission levels, CII requirements and potentially improving your energy class.

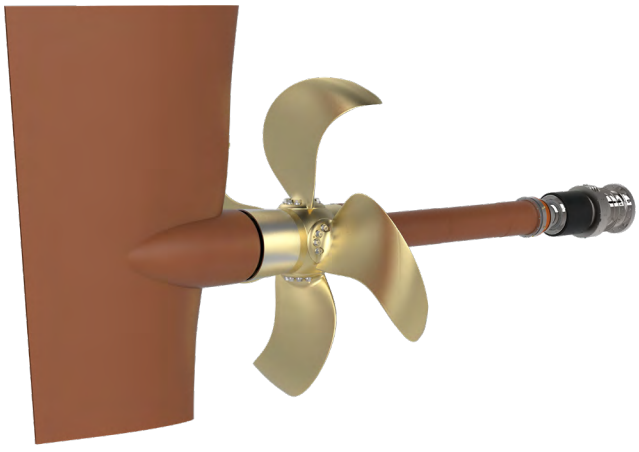
Based on your current operating profile and possible CII Rating, Everllence will support you, uncovering the potential of optimizing your current propeller configuration.

Leveraging state-of-the-art CFD (Computational Fluid Dynamics) analysis, design, and optimization tools, Everllence can provide an controllable pitch propeller optimization solution for your existing fleet.

Achieving perfect hydrodynamic propeller integration involves optimizing the propeller with the ship's hull and incorporating any flow-guiding and efficiency-enhancing devices, such as high-efficiency rudders and rudder bulbs.

Our solution is tailor-made for your specific vessel, featuring an optimized propeller blade design combined with other Everllence efficiency improving devices such as EcoBulb rudder bulb, fairing cone solutions and new combinator mode software.

Get more information
Learn more about our products and how our upgrade solutions can improve your propulsion performance. Do not hesitate to contact your local Everllence PrimeServ office for more information on possible upgrades.



System solution upgrade

Key benefits
- Increased propulsion efficiency
- Reduced power requirement, fuel consumption and emissions
- Scrap value of existing propeller blades can be included in the business case
- Short installation time for propeller blades and EcoBulb – normally less than one week
- Installation during normal overhaul can be carried out in connection and propeller maintenance / PMC
- Optimization supporting your Carbon Intensity Indicator (CII) targets
- Quick return on investment

Scope of supply
For propeller hub:
- Optimized controllable pitch propeller blades
- Slide and sealing rings
- Corrosion anode, if required

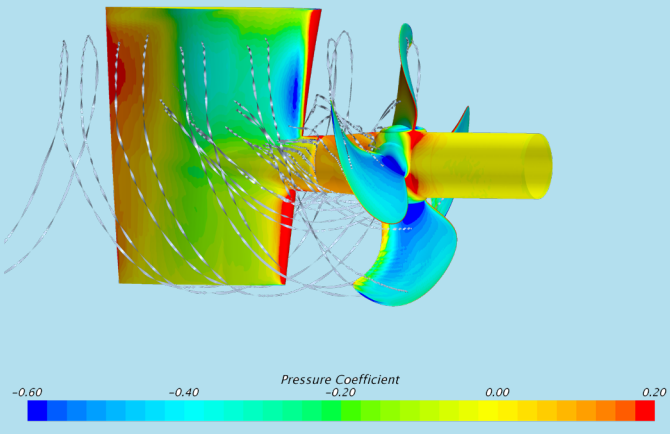
For propulsion control system:
- Review and optimization of existing combinator mode software

For rudder system:
- Steel EcoBulb, including all parts, for installation to existing rudder profile
- Stainless steel fairing cone for attachment to propeller hub

Classification:
- Including class approval of propeller blades and EcoBulb

Applicable to
Available for Alpha controllable pitch propeller configurations and V28/32S

Reference list
More than 100 vessels have optimized their Alpha controllable pitch propeller configurations with new and improved aft ship solutions



CP Propeller upgrade + Propeller nozzle

For optimizing the propeller thrust and pulling performance of specialized vessels, customized Alpha High Thrust (AHT) nozzle designs are offered.

The AHT nozzle designs offer superior performance compared to the '19A' propeller nozzles, which have been common standard in the marine industry.

The increased bollard pull achieved when using the AHT nozzle is not only a result of the CFD-optimized nozzle profile, which is double-curved on both the inner and outer surface. Other contributing factors are e.g., nozzle length/diameter optimization, nozzle built-in support, and aft ship lines adaption.

High-thrust and speed customized AHT nozzle installations are popular for vessels requiring increased pulling power and still limited free-sailing resistance.

Our range of ducted propellers and AHT nozzles are the thrust boosters for high performance vessels enabling bollard pull and towing force at very high levels.

The propeller blades are specifically designed and tailor-made for optimized operation with the AHT nozzles – customized into the aft ship vessel designs.

Please contact your Everllence PrimeServ office for more details.

Tailor-made AHT nozzle design for improved pulling power and fuel savings

Key benefits

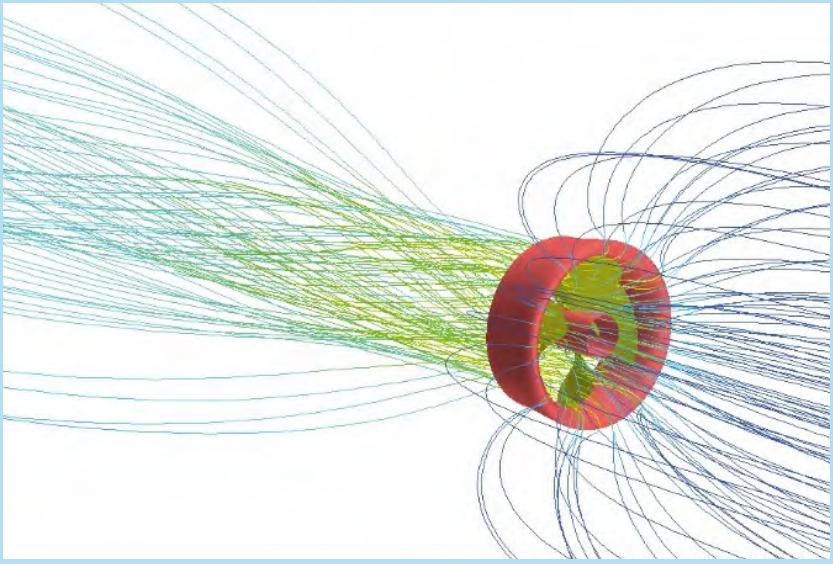
- More pulling power thanks to the increased propeller thrust especially at lower ship speeds
- Reduced fuel consumption – A specific bollard pull or towing force can be delivered at a reduced power output and engine rating
- Individual customization, balanced to application and aft ship design
- Retrofit potential gain exceeding 20% increased bollard pull when upgrading older nozzles to the AHT design, combined with state-of-the-art Alpha propeller blades

Scope of supply

- AHT nozzle
- State-of-the-art Alpha propeller blades optimized for the actual vessel operational profile
- All relevant propeller sealing and slide rings

Applicable to

Applicable for Alpha controllable pitch propellers operating in nozzle



EcoOptimizer

As part of our continuous development and constant strive to improve design, operational performance and economy – our optimized combinator-mode-software is now offered for propulsion solutions with Alpha controllable pitch propellers and Alphatronic control systems.

The total fuel oil consumption is determined by the power required for propelling the ship and the corresponding SFOC of the main engine. Comparing the runs of the optimum propeller and engine curves will reveal that they do not coincide. That is, one curve is optimum for the propeller, and another one for the engine.

Thus, if for each ship speed the required propulsion power and SFOC is calculated along each constant ship speed, the optimum setting of propeller shaft speed and propeller pitch setting can be determined.

This is considered when generating the third and final optimized combinator mode curve that will result in minimum fuel oil consumption.

Installing the optimized combinator mode software requires an Everllence superintendent with expert knowledge of the propulsion configuration.

If you have maintenance planned in the near future, it would be preferable to order the optimized combinator mode software, and have the service engineer install it when on board already.

Please contact your Everllence PrimeServ office for more details.

Fuel savings from optimized combinator-mode software

Key benefits
- Order now, install when convenient
- Fuel saving potential
- Overall economy-optimization and operational mode setting considering ship speeds, propeller pitch settings and individual main engine SFOC mapping
- Short payback time
- Performance and consumption display via Alphatronic 3000 and Alphatronic 2000

Scope of supply
- Optimized combinator mode software
- Everllence superintendent for installation and testing

Applicable to
Applicable for remote control systems types AT2000 and AT3000 from Everllence

Propulsion **Optimization Study**

Explore your vessel's propulsion optimization potential and get comprehensive suggestions on power and emission improvements. The comprehensive propulsion optimization study uncovers potentials and enables powerful decarbonization and fuel oil savings.

Uncover the optimization potential of your vessel
Everllence PrimeServ is dedicated to supporting decarbonization in the maritime industry. Therefore, we have introduced the Propulsion optimization study to uncover the potential emission and power savings by introducing various optimization solutions and methods, for example in terms of improving your current CII rating.

Our product range is constantly under review, being developed and improved according to present and future requirements and conditions. Operating at vessel speeds lower than the original design speed often offers a relatively high optimization potential. When exploited, further significant power and fuel savings can be gained.

Fair and reliable comparison
Based on your current operating profile and possible EEXI OPL (Overridable Power Limitation) Everllence PrimeServ will support you in uncovering the potential of optimizing your current propeller configuration, propulsion control system and aft ship.

Among others, the Propulsion optimization study includes a comparison between the existing propeller blade design and a new optimized propeller blade geometry. All based on the actual operational profile of your vessel. In this way, you will have a fair comparison proposal, when considering various optimization measures.

Improve your CII rating
Upgrade your CP propeller with the latest technology and hydrodynamic know-how. CP propeller optimization often provides substantial fuel savings, allowing your vessel to meet stricter emission levels and CII requirements.

Furthermore, it offers the potential to improve your energy class while optimizing your operational economy, thereby providing a short return on investment.

Depending on the existing propulsion control configuration, the Propulsion optimization study will also uncover the optimization potential by improving the existing combinator mode software. A feature that often goes very well in hand with a reduced vessel optimization speed.

The Propulsion optimization study requires a number of operational details, hence a specific questionnaire will be shared when ordering the study.

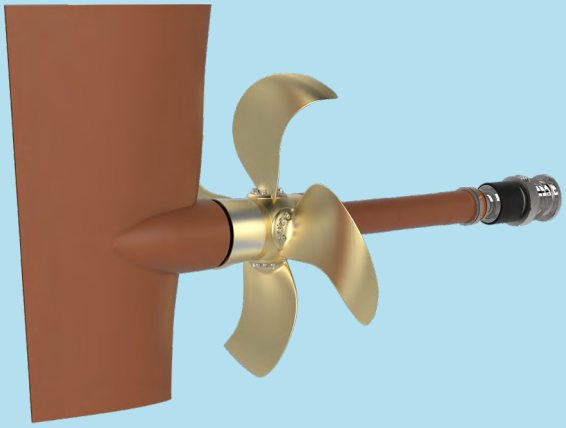
Please contact your Everllence PrimeServ office for more details.

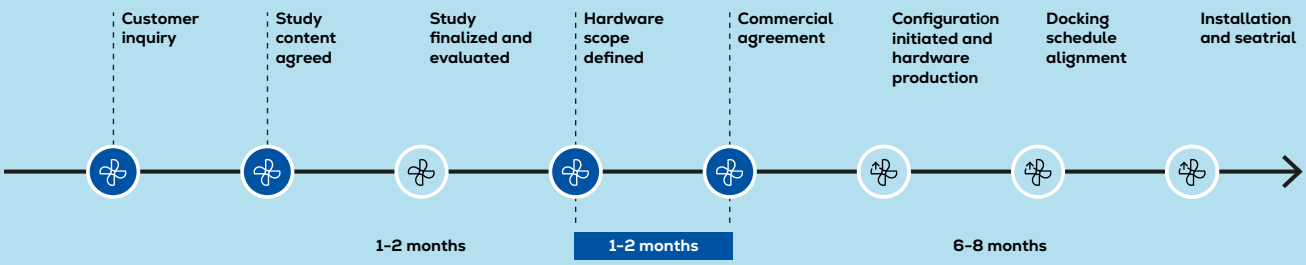
Explore your in-service vessel's propulsion power savings

Key benefits
- Uncovers your potential propulsion power savings
- Transparent comparison that enables you to decide your next steps
- Possible improved CII ratings
- Transparency regarding short return of investment

Scope of supply
- Propulsion optimization study
- Preliminary propeller blade design
- Comparison between the existing and the optimized configuration
- EcoBulb rudder bulb performance
- Alphatronic propulsion control optimization suggestions
- Speed and power predictions

Applicable to
- Alphatronic propulsion control systems: AT2000 and AT3000
- Propeller types: Full portfolio of Alpha controllable pitch propeller configurations





AT2000 REM401 I/O card replacement

The production of the REM401 I/O card has been discontinued, so a retrofit replacement is needed.

We recommend that you implement this retrofit in due time, as a defective REM401 module will leave your vessel out of service until the retrofit has been performed. Being proactive and retrofitting before any breakdown, will save you time and money.

Retrofitting the PCS REM401 I/O modules with the new I/O modules is unfortunately not a plug-and-play solution. You need an upgrade of the CPU as well, and therefore we have made a complete retrofit package.

Installing the new REM401 upgrade package requires an Everllence superintendent with expert knowledge of the system. If you have any maintenance planned in the near future, it would be preferable to order the REM401 upgrade package and have the superintendent install this when on board already.

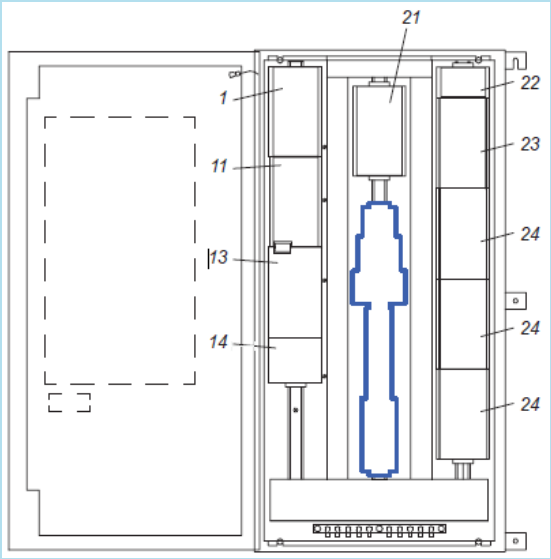
Please contact your Everllence PrimeServ office for more details.

Protect your fleet from downtime with updated I/O cards

Key benefits
- Order now, install when convenient
- Fast (1 day) installation
- Avoid loss of system features
- Upgraded control software
- Calibration of propulsion control system included
- Health check of the propulsion system included

Scope of supply
- I/O module and CPU chip
- Programming of software
- Installation and loading of sofware

Applicable to
Applicable for AT2000 Propulsion Control System



AT3000 remote control system retrofit

Get a tailored propulsion control system to your vessel. Everllence has designed a new control system consisting of standard control elements that can be tailored individually. The new system design is the result of our continuous efforts to develop and improve our products to ensure that they perform to the highest current and future standards.

The Alphatronic 3000 remote control system is the optimal retrofit solution for Alpha controllable pitch propellers that need to upgrade an existing remote control system, for example due to obsolete components.

We recommend having such a retrofit done in due time, as a defective remote control system will leave your vessel out of service. Be proactive and retrofit before risking a breakdown. This will save you time and money.

The control system fulfills requirements for propulsion plants with two- or four stroke engines connected to controllable pitch propellers. The AT3000 system is a remote control system designed to control the ship's propulsion machinery, and it can be retrofitted to all vessels that have Alpha controllable pitch propeller configuration.

Commissioning the AT3000 retrofit requires an Everllence superintendent with expert knowledge of the AT3000 system.

Please contact your Everllence PrimeServ office for more details.

Customized propulsion control system for reliable manoeuvring

Key benefits
- Avoid system failure and vessel downtime
- Safe control of the propulsion plant and reliable manoeuvring of the ship
- Touch screen (7 inch) with easy and logical user interface (HMI)
- Minimal service and maintenance requirements
- Potential fuel savings due to optimzed combinator curves and control modes
- User-friendly functions due to logic and ergonomic design of control panels, handles, and displays
- Optional speed pilot, pitch fine adjust, and VFD mode.

Scope of supply
- AT3000 Remote control system hardware and vessel-specific software
- Complete documentation packageand installation guide
- Class approval.

NOTE: Cabling and hardware installation not included. This is considered the scope of a third party

Applicable to
Applicable for Alpha CPP configurations

Cable package retrofit

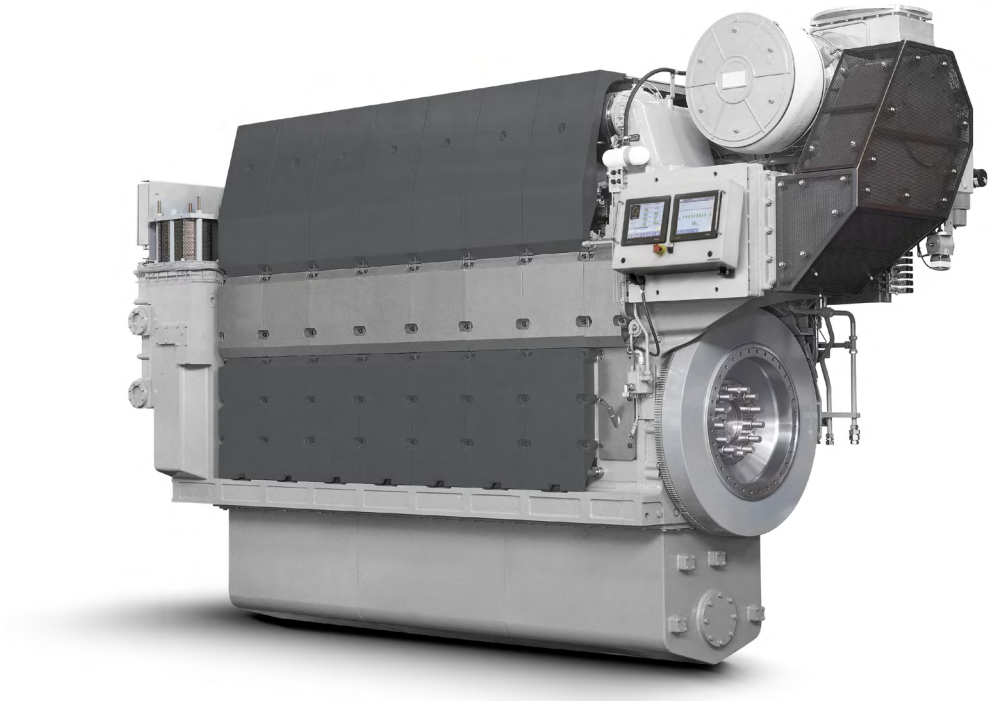
Engine cabling and connections are worn over time, causing bad connections and periodic errors in the safety and monitoring system. This often triggers false alarms and causes risk of unintentional operational delays.

We recommend to have this retrofit done in due time, as worn cabling potentially will leave your vessel out of service, until the retrofit is performed. Being pro-active will save you time and money.

Retrofitting existing cables and connections fitted on the engine, and installing the cable package retrofit requires an Everllence superintendent with expert knowledge of the engine and cable installation.

If you have any maintenance planned in the near future, we recommend ordering the cable package retrofit now, and have it installed by the superintendent while on board already.

Please contact your Everllence PrimeServ office for more details.



Retrofit engine cables and connectors to secure your operational uptime

Key benefits
- Avoid system failure and vessel down time
- Order now, install when convenient
- 3 days installation (Estimated)

Scope of supply
- Complete cable package
- All relevant connections and plugs
- Fittings and cable glands

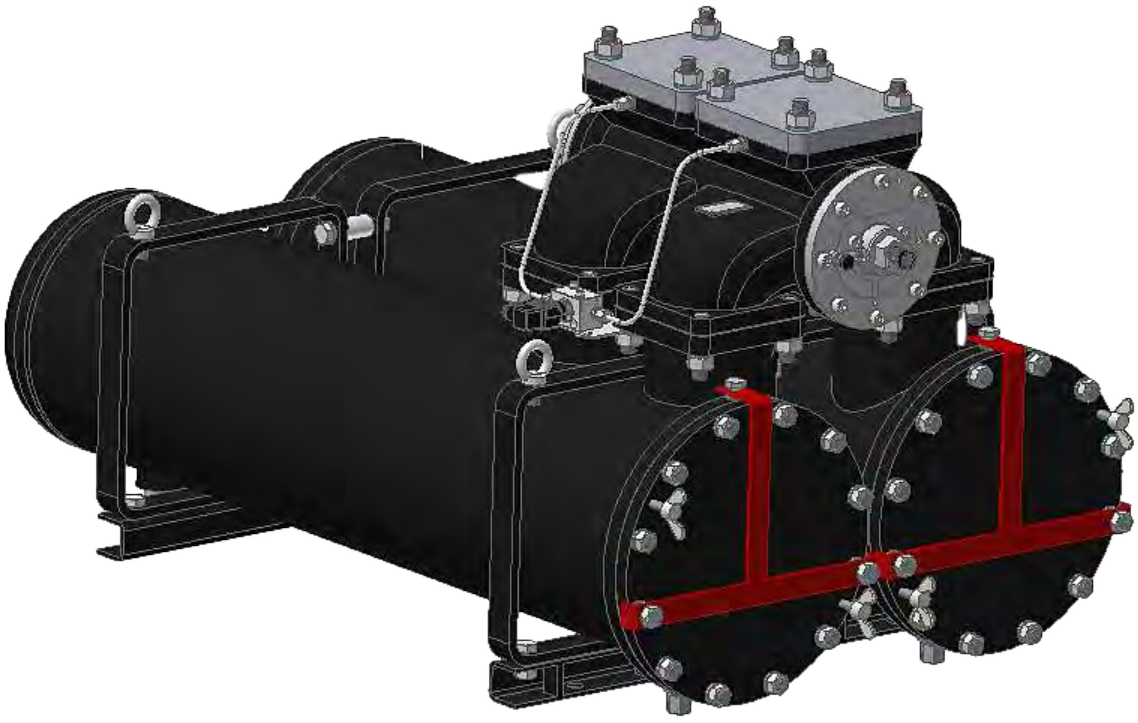
Applicable to
Applicable for propulsion engines L27/38 and L21/31

External exchangeable **lube oil filter**

Several vessel owners have requested a solution for exchangeable filtration for their lubrication system. The paper filter elements will last longer if the separator is in operation, but the system will allow the existing lube oil separator to be out of service.

Everllence has designed and released an insert, replacing the existing built-in backflushing filter with a “filter dummy”. This device will lead the oil flow through an external filter cartridge with exchangeable paper filter.

Please contact your Everllence PrimeServ office for more details.

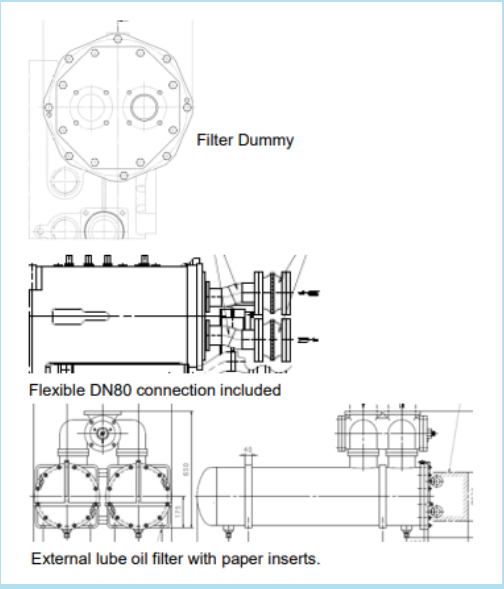


Easily exchangeable filtration for lubrication system

Key benefits
- Order now, install when convenient
- Easy installation
- Easily exchangeable filter inserts
- Installation can be done while in service, only a few hours out of service is necessary

Scope of supply
- Installation of the new “filter dummy”
- Fitting of external filter
- Piping from the engine to wherever the external filter is installed
- Piping and fitting of the external filter can be done during normal operation.
- This means that the vessel will only be out of service for a few hours, while replacing the existing filter with the “filter dummy” and connecting the piping.
- Piping is not included and is a shipyard/piping workshop task

Applicable to
Applicable for engine type L27/38



Propeller pitch **feedback system**

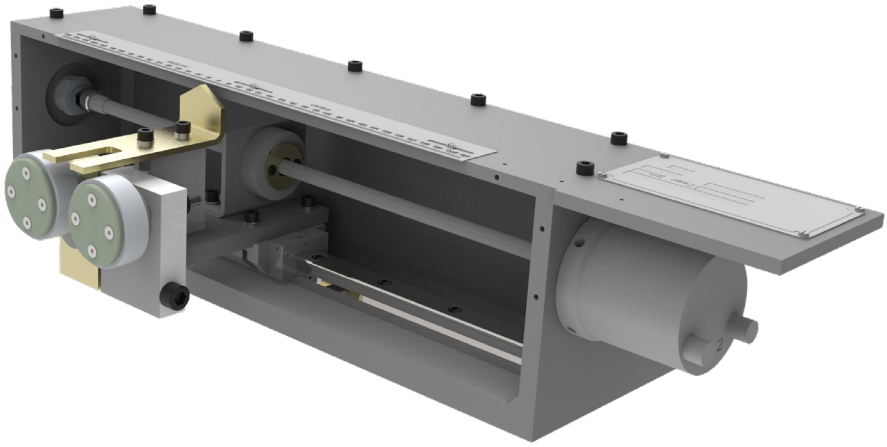
As part of our continuous development and commitment to enhancing our solutions, we have released an innovative design that offers improved pitch feedback accuracy for Alpha VBS ODS configurations.

Our product range is constantly reviewed, developed and improved to meet present and future requirements and conditions. As part of this commitment, Everllence has designed a new rotor bracket retrofit, for the electrical ODS (oil distribution unit located in the shaft line) mounted pitch feedback control systems.

Take advantage of our continuous development policy, combined with the extensive in-service experience accumulated from large propeller populations. This ensures lifelong service support and stable propeller pitch control.

The new rotor bracket retrofit ensures better control of the pitch and and is compatible with ODS mounted Alpha VBS (CP propeller with servo integrated in hub) pitch control systems. The conversion from the old to the new rotor bracket can be completed by an Everllence superintendent during on-board maintenance. Installation time is less than a day.

Please contact your Everllence PrimeServ office for more details.



Improved pitch feedback accuracy, mechanical reliability, and TBO's

Key benefits

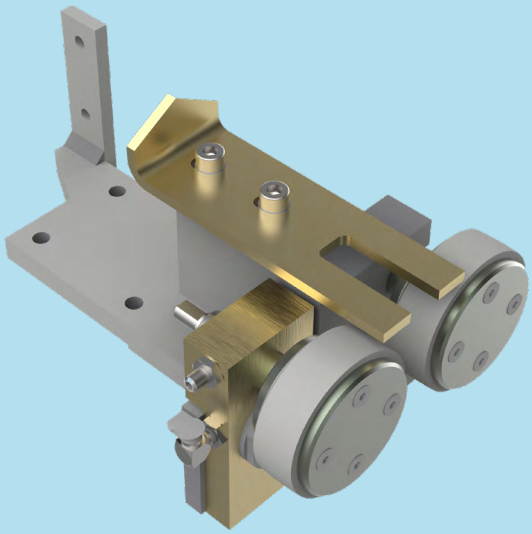
- Robust and durable mechanical design
- Improved roller guides: Reduces wear and extends time between overhauls
- Safety bracket: Ensures full pitch control in case of malfunction
- Reliable and precise electrical feedback signals
- Quick and safe installation guidance
- Optimized roller design: Maintains position without large tolerances
- Indicator design: Ensures stable pitch, even if rollers are mechanically damaged

Scope of supply

- Alpha ODS Propeller pitch feedback retrofit
- Everllence superintendent for installation

Applicable to

Alpha CPP configurations with ODS mounted pitch feedback control systems



Crankcase **monitoring system**

The crankcase monitoring system will monitor the most vital parts of your engine and warn you in due time if temperature levels are reaching critical limits. Immediate detection of any increase in temperature is an important contribution to damage prevention and crew safety.

The crankcase monitoring system is part of the engine safety concept. The general task of the system is to protect the engine against serious consequential damage, for example if a bearing failure occurs.

Each cylinder unit is fitted with splash oil monitoring. The splash oil is caught in an oil trap with a temperature sensor on the inside of the crankcase covers. In addition, main bearing temperature sensors are mounted on each main bearing. The temperature values are displayed on the crankcase monitoring panel and are interfaced to the engine safety system.

The crankcase monitoring panel can be installed in the engine room or in the engine control room (up to 80 meters from the multifunction control box).

Installing the crankcase monitoring system requires an Everllence superintendent with expert knowledge of the system.

If you have any maintenance planned in the near future, we recommend to order the crankcase monitoring system and have the superintendent install it while already being on board.

Please contact your Everllence PrimeServ office for more details.

Ensure critical temperature detection, preventing damage and enhancing crew safety

Key benefits

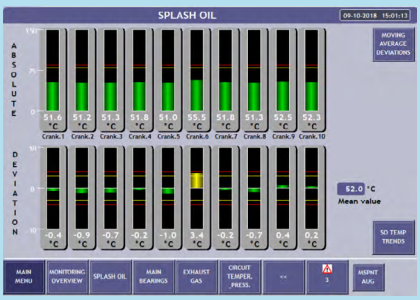
- Order now, install when convenient
- The splash oil monitoring system measures the oil temperature for each cylinder unit.
- The main bearing temperature sensors measure the main bearing temperatures.
- Alarm and engine shutdown in the event that the oil temperature reaches a critical limit.
- The crankcase monitoring system minimizes the risk of serious consequential damage (e.g. on the crank shaft)

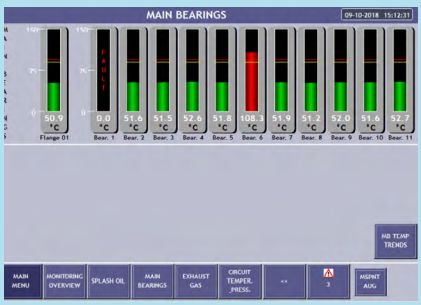
Scope of supply

- Crankcase monitoring panel
- Fitting of engine covers with a splash oil kit
- Temperature sensors for splash oil monitoring
- Temperature sensors for main bearing monitoring
- Cables and mounting parts
- Special tools

Applicable to

Applicable for engine types L23/30A, L28/32A, L21/31 and L27/38





Deuta werke tacho converter replacement

The Deuta werke tacho converter modules are outdated and are no longer serviceable. Therefore, we have developed a successor, built on our SaCoS platform.

The Deuta werke retrofit is a complete exchange of the existing tacho converters with new SaCoS modules. Unlike the Deuta Werke, the SaCoS modules are software-based and have a long life expectancy.

Replacing the Deuta werke tacho converter with new SaCoS requires an Everllence superintendent with expert knowledge of the system. If you have any maintenance planned in the near future, we recommend to order the SaCoS modules and have the superintendent install them when on board already.

Please contact your Everllence PrimeServ office for more details

Updated software-based platform with long lifetime expectancy

Key benefits
- Order now, install when convenient
- Long life expectancy
- Software-based platform
- Requires only a few modifications to the propulsion system

Scope of supply
- Installation of new cabinet with SaCoS module
- Alteration and modification of the existing cabinet and interfacing to SaCoS
- Commissioning of SaCoS module
- HAT with classification surveyor
- Project-specific software package
- Class approval

Applicable to
Engine types with Deuta werke tacho converter replacement modules.

T23, L23/30, L23/30A, V23/30A, U28, L28/32, L28/32A and V28/32A
(in general, engines built before year 2000)

L27/38 fuel system upgrade

By installing the fuel system upgrade and the improved fuel filters in strategically safe areas, Everllence PrimeServ Frederikshavn makes sure that your L27/38 will be updated to today's modern standards.

After the retrofit, your L27/38 engine will fulfill the latest SOLAS regulations, with improved general safety and reliability of your vessel.

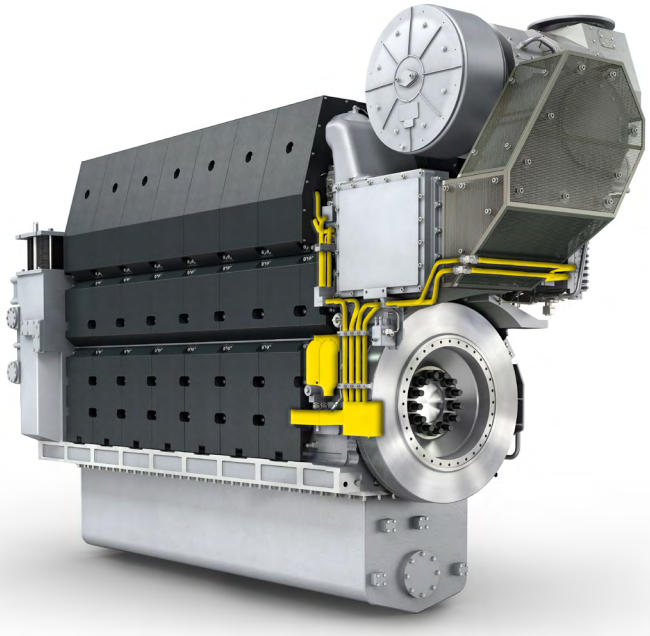
The graphic below illustrates how the fuel pipes have been removed from the hot areas of the exhaust piping and turbocharger, and reinstalled in safer areas.

The external fuel piping needs to be changed accordingly, and universal pipes and connectors are included in the upgrade package. Improved fuel filtration units are also included in the package.

Installation of the Fuel system upgrade package requires an Everllence superintendent with expert knowledge of the L27/38 propulsion engine.

If you have maintenance planned in the near future, it would be preferable to order the fuel system upgrade package, and have the Everllence PrimeServ service engineer install it when on board already.

Please contact your Everllence PrimeServ office for more details.

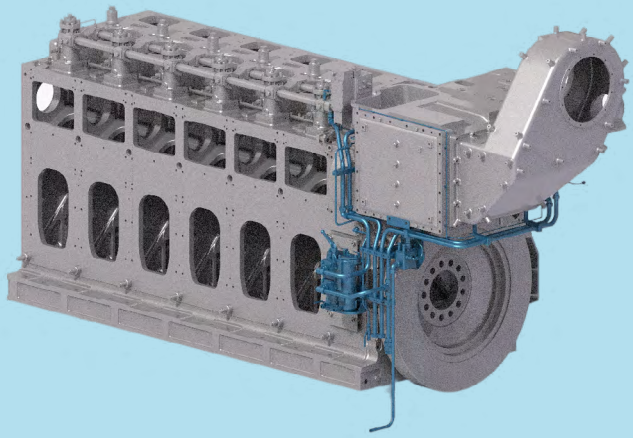


Improve your filtration system and increase the equipment's lifetime

Key benefits
- Order now, install when convenient
- Improved filtration
- Increased fuel equipment lifetime
- Reduced risk of fire
- Safe operation

Scope of supply
- Improved fuel filtration units from 50 down to 10 microns depending on existing configuration
- Drip tray and related parts
- Complete set of pipings, valves and connectors

Applicable to
Applicable for L27/38 marine propulsion engines



Lube oil **centrifugal filter**

Extra cleaning through a centrifugal filter is an option that ensures proper performance and a long lifetime of the lubricating oil. Centrifugal oil cleaners provide superior bypass filtration that removes contaminants from the lubricating oil of marine engines.

This filter removes contaminants by means of centrifugal force. The centrifugal lubricating oil filter is easily fitted on the engine side cover, near the front-end box.

The filter is designed with a paper insert, making it easier to clean the system periodically. Please note that centrifugal filter installations do not replace the external separator units.

If the centrifugal by-pass filter is building up deposits, it indicates that the external separator unit is working poorly.

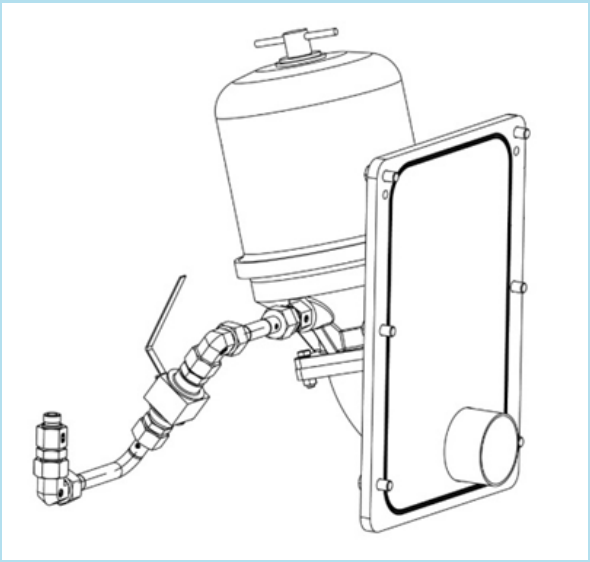
Please contact your Everllence PrimeServ office for more details.

Extend oil lifetime and reduce engine wear

Key benefits
- Order now, install when convenient
- Cleaner lubricating oil
- Extension of oil lifetime
- Reduced engine wear
- Enhances long-time preventative maintenance
- Reduces total cost of ownership

Scope of supply
- Cyclone filter retrofit.
- Side cover adapted to the Cyclone filter retrofit
- Piping for connection to existing lubricating oil system

Applicable to
Applicable for the engine types L21/31 and L27/38



Safety and monitoring module replacement

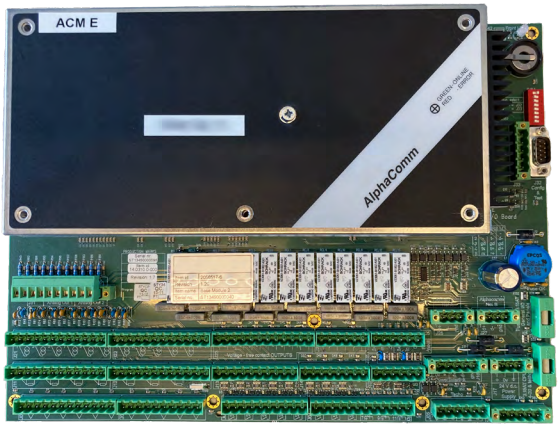
The existing safety and monitoring base modules have been discontinued, so a retrofit replacement is needed.

We recommend to do this retrofit in due time, as a defective base module will leave your vessel out of service until the retrofit is performed. Being pro-active and retrofitting before any breakdown, will save you time and money.

Retrofitting the engine and gear-mounted base modules with the new version 2 (BM2) modules is unfortunately not a plug-and-play solution. Adaption and upload of the BM2 software configuration is required, and we have therefore made a complete retrofit package.

Installing the new BM2 upgrade package requires an Everllence superintendent with expert knowledge of the AT2000 system. If you have any maintenance planned in the near future, we recommend to order the BM2 upgrade package now, and have the superintendent install it when already on board.

Please contact your Everllence PrimeServ office for more details.



Existing Module

New BM2 Module

Updated retrofit solutions for safety and monitoring modules

Key benefits
- Avoid system failure and vessel downtime
- Order now, install when convenient
- Fast (1 day) installation

Scope of supply
- Installation of the new I/O modules
- BM2 hardware including adaption and upload of vessel specific software configuration

Applicable to
Applicable for L27/38 and L21/31 propulsion engines without SaCoS safety/ monitoring system. And for Alpha CP propeller configurations, in combination with AT2000 remote control system

Permanent Power Limitation Alphatronic

Permanent Power Limitation (PPL) is a retrofit solution designed to limit the engine power (MCR) in compliance with the IMO resolution MEPC 335 (76) from 2021. The PPL Alphatronic is an alternative to the well-known OPL Alphatronic.

Our product range is continuously reviewed, developed and improved to meet current and future requirements and conditions. Furthermore, we are dedicated to supporting decarbonization in the maritime industry. As part of this commitment, we have developed a Permanent Power Limitation (PPL) solution that can be integrated into propulsion configurations, including Alphatronic systems.

As an alternative to the overridable power limitation (OPL), the PPL offers a relatively simple solution. It is ideal for situations where a minor MCR limitation is needed or if a vessel never operates at MCR.

The scope of the PPL solution is customized based on the existing remote control configuration and the main engine, tailored on a case-by-case basis. The PPL Alphatronic solution typically includes an upgrade of the existing remote control software to limit the MCR to the required level at the system level, along with a sealed physical fuel rack limitation installed on the main engine.

It is important to note that the PPL Alphatronic is not directly related to overridable EEXI solutions.

Therefore, no onboard management manual or EEXI class approvals are required. Everllence PrimeServ verifies and assumes responsibility for the correct adjustment and limitation in accordance with the required lower MCR.

Installing the PPL Alphatronic solution requires an Everllence PrimeServ superintendent with expert knowledge of the of the specific remote control system and engine configuration.

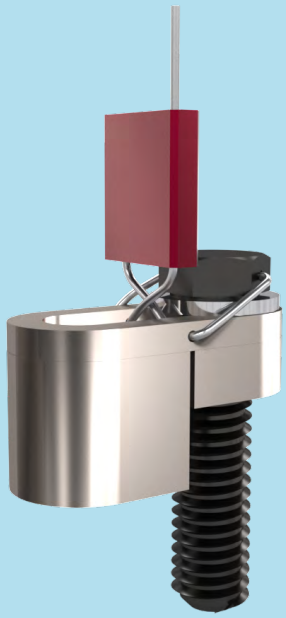
Please contact your Everllence PrimeServ office for more details.

Comply with with IMO resolution MEPC 335 (76) from 2021

Key benefits
- Easy EEXI compliance
- Quick installation in just one day
- Stable propeller system and engine behaviour
- Aligned remote control system and engine limitation

Scope of supply
- Remote control software update: Includes programmed limitation
- Physical fuel rack limitation: Comes with a tamper-proof seal
- Verification: Everllence PrimeServ report verifying the limited MCR

Applicable to
Remote control systems: AT2A, AT2000 and AT3000 Engine types: Full portfolio of propulsion engines



Overridable Power Limitation Alphatronic

Overridable Power Limitation (OPL) Alphatronic is a retrofit solution designed to lower the energy efficiency index for existing ships (EEXI) by limiting the engine power of the existing fleet to comply with the IMO resolution MEPC 335 (76) adopted on 17 June 2021.

Based on global measures to reduce greenhouse gas (GHG) emissions from shipping, new amendments were introduced at the International Maritime Organization's (IMO's) MARPOL convention in June 2021. The amendments include new energy efficiency provisions – the Energy Efficiency Existing Ship Index (EEXI) and the Carbon Intensity Indicator (CII).

Vessels affected by EEXI have to attain EEXI approval by the first periodical survey in 2023 – at the latest.

Among others, the ship type, ship capacity, and the principle of propulsion determine the EEXI value required, that is, the maximum acceptable attained EEXI value. The EEXI value must be calculated individually for each vessel affected by the regulation, and the outcome provides the necessary power limitation to fulfill the EEXI requirements.

The requested overridable power limitation (OPL) is implemented in the existing controllable pitch propeller (CPP) remote control system. The limits are then set and controlled by the remote control system (OPL activated/overridden). A remote operating push-button, normally installed on the main bridge, determines if the OPL is activated or overridden.

As the engine load equals the propeller thrust (pitch angle and rpm), and all relevant and required signals are available in the remote control system (index, charge air pressure, rpm, pitch, etc.) the overall main engine load is managed by the CPP remote control system.

Installing the system level EEXI compliant software requires an Everllence superintendent, with expert knowledge of the propulsion configuration. The OPL Alphatronic solution includes superintendent assistance for programming, uploading and testing of the new compliant software.

Please contact your Everllence PrimeServ office for more details.

Retrofit solution designed to lower the energy efficiency index (EEXI)

Key benefits

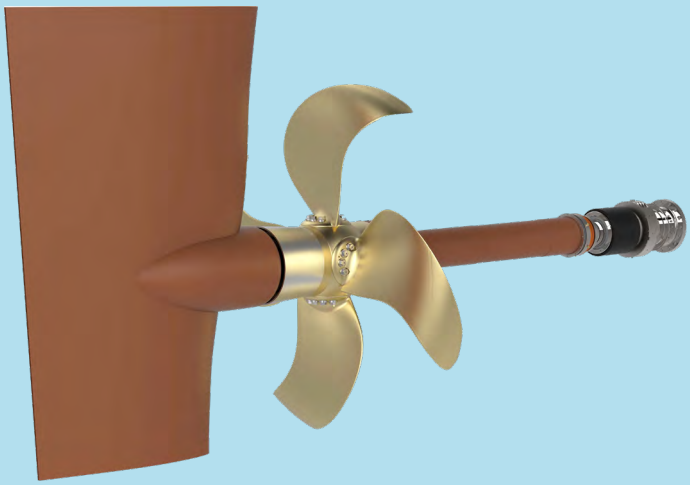
- Easy installation on AT2000 / AT3000 remote control systems
- Activated/overridden OPL directly from main bridge
- Override logging
- Optimized for better performance (combinator curves reviewed, optimized and implemented)
- Stable and efficient propulsion control thanks to system level OPL, with minimum wear on the propulsion configuration, and lowest possible fuel oil consumption

Scope of supply

- EEXI compliant software including review and optimization of existing combinator curves
- Push button for OPL activated overridden
- Onboard management manual (OMM)
- Everllence PrimeServ superintendent for installation and test

Applicable to

Applicable for CPP remote control systems type AT2000 and AT3000



Tier II upgrade

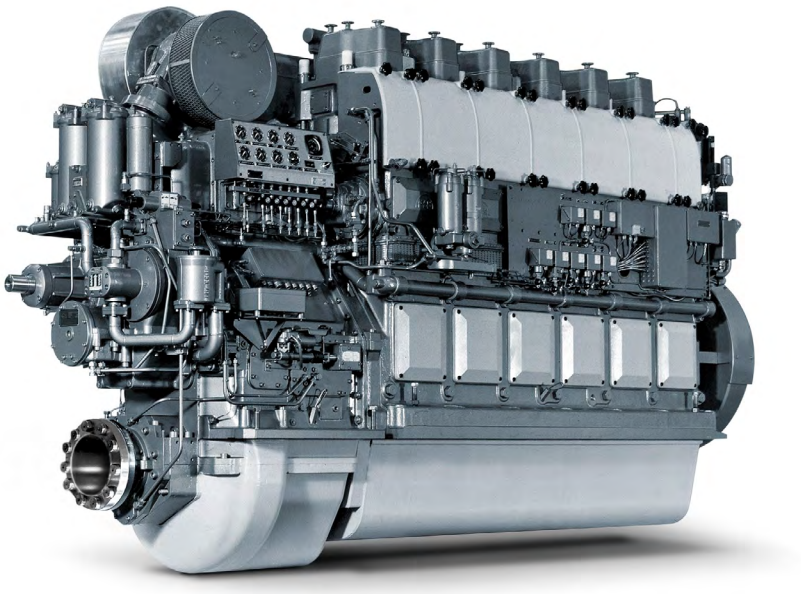
With the introduction of IMO Tier regulations in MARPOL Annex VI, vessels with medium speed engines must comply with Tier II regulations globally and Tier III regulations locally in ECA areas.

The pre-2011 four-stroke L23/30, L27/38 and L28/32 medium speed engine types were not designed for Tier II compliance. However, Everllence has launched a Tier II upgrade kit to recertify the engines to Tier II compliance.

The upgrade and Tier II compliance is obtained by internal engine modifications, i.e. simple exchange of components. The exact scope of modification depends on the specific engine type.

The ship's crew normally carries out the Tier II upgrade with the support of an Everllence superintendent who has expert knowledge of the propulsion configuration. The Tier II upgrade can be performed while overhauling the engine in connection with planned maintenance.

Please contact your Everllence PrimeServ office for more details.

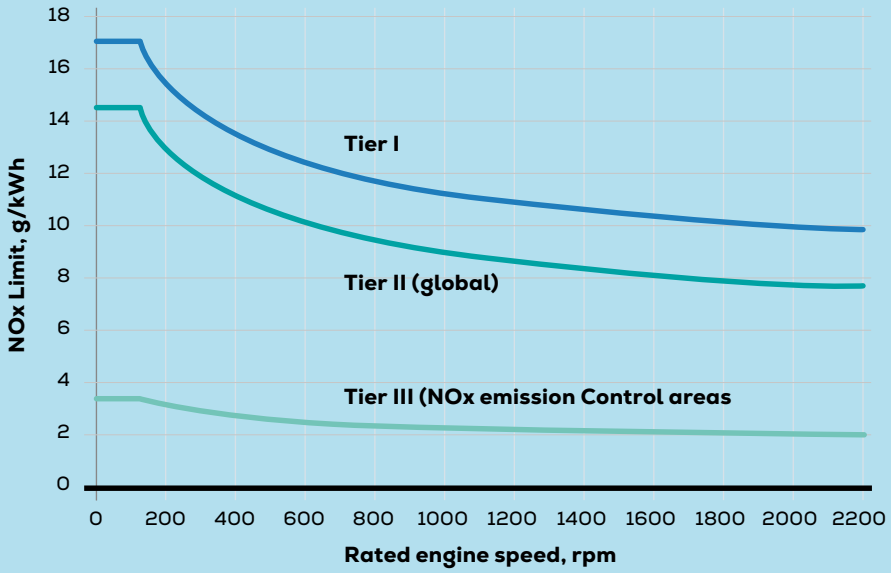


Achieve low emission levels and regulatory compliance

Key benefits
- Lower emission levels
- Compliance with regional and local legislation on emission levels
- Tax reduction as local authorities have introduced, or may introduce, emission fees
- New certification for EIAPP
- No on-board emission measurments required

Scope of supply
- All relevant IMO components, according to the parent engine certificates
- New technical file to achieve the EIAPP certificate from the relevant classification society

Applicable to
Applicable for the engine types L23/30, L23/30A, V23/30A, L27/38, L28/32, L28/32A and V28/32A



Tier III upgrade

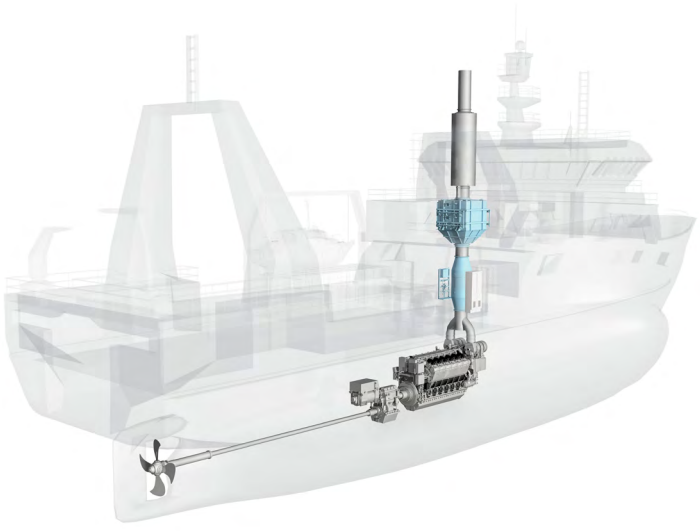
Retrofitting your vessel with a selective catalytic reduction (SCR) system from Everllence will reduce nitrogen oxides (NO_x) emissions by up to 90%.

Tier III compliance is ensured by the ability to operate the SCR even at the lowest loads. The flexibility of the system even enables compliance with the special requirements specified by the NOx Fund, ESI, CSI, Green Award, and access to world heritage fjords, etc.

The SCR is based on a component delivery concept that is directly connected to the engine control system, and which ensures a high operational safety with the minimum urea consumption.

The proven modular SCR system design fits perfectly with all four-stroke engines in service.

Please contact your Everllence PrimeServ office for



Reduce your NO_x emissions with up to 90%

Key benefits
- Tier III compliance
- Tailor-made design and installation
- Efficient low-load operation with integration of waste gate system
- Automatic honeycomb regeneration process
- Reducing soot and smoke
- Urea efficient
- Optimized according to actual exhaust system back-pressure

Scope of supply
- SCR components
- Planning & installation documentation
- Commissioning
- Customer documentation

Applicable to
Applicable for the four-stroke engine portfolio

Product overview

Retrofit & upgrade

Benefits	Black smoke limitation package	Controllable pitch propeller optimization	CP Propeller upgrade & Propeller nozzle	EcoOptimizer	Propulsion Optimization Study	AT2000 REM401 card replacement
Save fuel oil		✓	✓	✓		
Slow steaming		✓		✓		
Flexible operation	✓	✓	✓	✓		
Reduce emissions	✓	✓	✓	✓		
Reduce maintenance					✓	✓
Improve safety					✓	✓
Reduce downtime					✓	✓

Applicability

Please refer to the details under each individual section

Decarbonization
Increase your vessel's sustainability profile, save fuel oil, and support your decarbonization compliance.

l I/O place-	AT3000 remote control system retrofit	Cable package retrofit	External exchangeable lube oil filter	Propeller pitch feedback system
	✓			
	✓			
	✓			✓
	✓			
	✓	✓		✓
	✓	✓	✓	✓
	✓	✓	✓	✓

Operational efficiency
Improve your efficiency and reliability by optimizing lube oil consumption, maintenance, and legacy managemente.

Product overview

Retrofit & upgrade

Benefits	Crankcase monitoring system	Deuta werke tacho converter replacement	L27/38 fuel system upgrade	Lube oil centri-fugal filter	Safety moni-toring module replacement	Perm Powe Limit Alph
Save fuel oil						✓
Slow steaming						✓
Flexible operation						✓
Reduce emissions						✓
Reduce maintenance		✓	✓	✓	✓	✓
Improve safety	✓	✓	✓	✓	✓	
Reduce downtime	✓	✓	✓	✓	✓	

Applicability

Please refer to the details under each individual section

Safety improvement
Optimize crew and vessel safety, including operatio-nal stability.

Re
Su
pro
thr

nanent er cation atronic	Overridable Power Limitation Alphatronic	Tier II upgrade	Tier III upgrade
	✓		
	✓		
	✓		✓
	✓	✓	✓
	✓	✓	✓
			✓

gulatory compliance
pport your vessles' regulatory compliance and
otect your fleet's engines systems from external
reats.

Retrofit solutions

Upgrade your fleet's competitiveness with powerful retrofits

From mechanical and digital upgrades to comprehensive dual-fuel conversions, we specialize in advanced retrofits and upgrades for your vessels.

Keep your engine systems and equipment competitive
Our portfolio of upgrade products and tailored retrofit solutions offers a vast selection of innovative options to optimize your fleet's reliability, efficiency, decarbonization, safety, and compliance. This supports your operation's competitiveness in an ever-evolving market with increasing environmental standards.

In addition to our **four-stroke propulsion & CP Propeller solutions**, our portfolio includes:

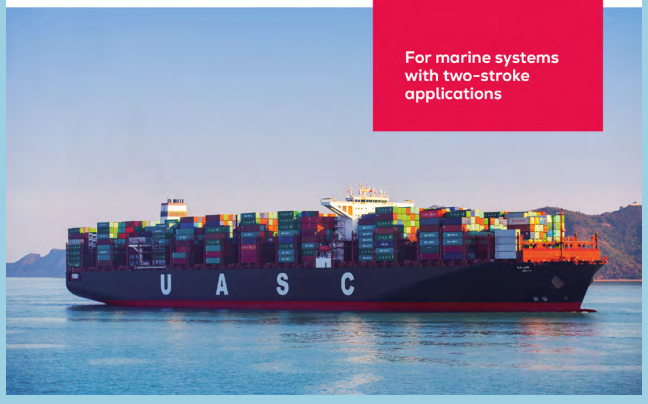
- **Two-Stroke Engine Solutions:** Optimize your two-stroke engine operations with powerful PrimeServ upgrades. Achieve fuel oil savings, improve decarbonization, boost reliability, reduce maintenance costs, and secure crew safety with advanced retrofit equipment. Keep your operations competitive and compliant.
- **Four-Stroke GenSet Solutions:** Reliable, compact power for auxiliary and main power supply in diesel-electric propulsion. Maintains operational efficiency, meets regulatory requirements, and saves space.
- **Dual-Fuel Retrofit Conversions:** Significantly optimizes engine emissions, fuel oil consumption, and the decarbonization profile by converting to dual-fuel systems.This complete retrofit conversion enhances environmental compliance and operational flexibility, allowing switching between traditional fuel oils and e-fuels.

For more information, please visit our website to explore our retrofit brochures or contact us to learn more.

Everllence PrimeServ

Dual fuel conversion

For marine systems with two-stroke applications

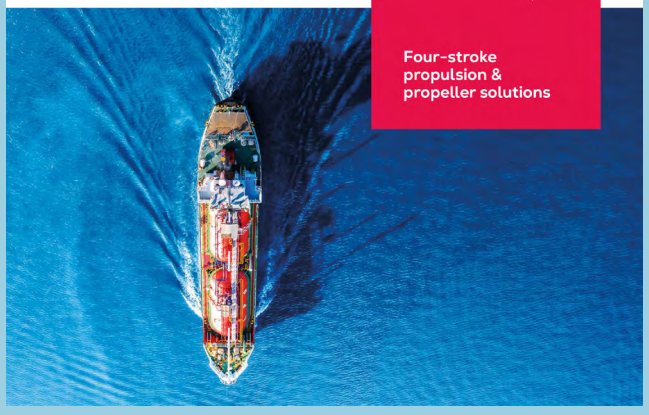


Everllence PrimeServ

Retrofit **& upgrade**

Products services portfolio

Four-stroke propulsion & propeller solutions



Everllence PrimeServ

Retrofit **& upgrade**

Products services portfolio

Four-stroke GenSet solutions

Everllence PrimeServ

Retrofit **& upgrade**

Products services portfolio

Two-stroke engine solutions

PrimeServ
Service with passion

Everllence PrimeServ is the dedicated Everllence service brand. Via a network of over 100 service centers worldwide, Everllence PrimeServ provides 24/7 service across the globe. Our range of services includes technical support, consulting and OEM spares, as well as maintenance, repair and comprehensive individualized service plans.

24

hours a day

365

days a year

HH

BABCOCK BORSIG

SULZER TURBO

B+V Industrietechnik

Everllence

Alpha PROPULSION SYSTEMS

S.E.M.T. PIELSTICK

Ruston

Paxman

Mirrlees Blackstone

HOLEBY GENERATING SETS

B&W MOTOR

Everllence and legacy brands
Everllence PrimeServ is our brand name for high-quality aftersales support for the entire Everllence product portfolio. Through refinements to our products and repair techniques, we ensure and enhance our technological leadership and technical expertise as an original equipment manufacturer (OEM) for the brands united under Everllence.

Everllence PrimeServ's aim is to provide

- Prompt delivery of high-demand OEM spare parts within 24 hours
- Fast, reliable and competent customer support
- Individually tailored O&M contracts
- Ongoing training and qualification of operators and maintenance staff
- Global service, 24 hours a day, 365 days a year
- Diagnosis and troubleshooting with our high-performance online service

Worldwide service

We offer retrofitting and upgrade services to bring complete propulsion configurations already in service up to the very latest standards of performance and efficiency.

100

Services centers worldwide

Represented in all key markets and major ports, with a network of more than 100 service centers, and with skilled field service managers at the ready to provide first-class technical support, Everllence PrimeServ is fully primed to provide 24/7 service, wherever you are. In power plants, marine engines & systems and turbomachinery, offering reliable technical support when you need it most, our service solutions include OEM spare parts, engine and machinery maintenance and repairs, customized service agreements, and individual consulting.

For existing equipment, our holistic retrofit and modernization solutions keep your engines or turbochargers up-to-date and at optimal levels of reliability, availability, and economic efficiency. Through cutting-edge digital technology we are able to enhance performance and minimize downtimes, while our remote connections enable live data analysis, ensuring quick, and effective solutions. Everllence PrimeServ Academies provide expert training courses around the world, developing the operational and maintenance skills required.

For more information please visit
www.everllence.com/services

Everllence

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