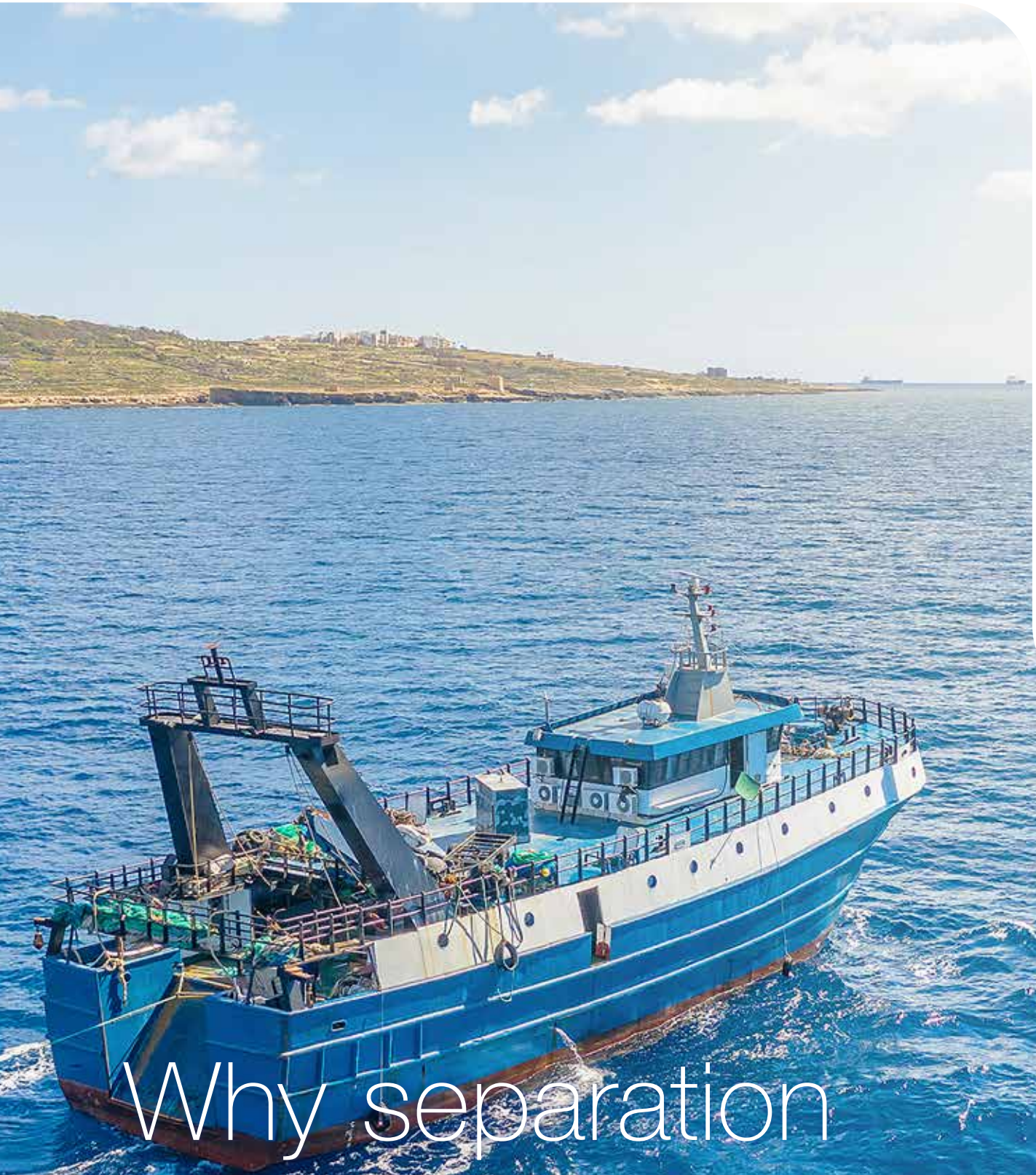
How to reel in operational cost and extend equipment life

Fuel and lube oil cleaning solutions for fishing vessels



Why separation makes sense for fishing vessels

Efficient cleaning of fuel and lube oil is essential on a fishing vessel, just as on other vessels. Fuel and lube oil quality means smooth and trouble-free operations, which increase equipment lifetime and productivity. Centrifugal separation is not only the most reliable treatment technology, but also the most cost-effective.

What is efficient cleaning?

Fuels and oils contain solid particles and water that pose significant risks to equipment. If not effectively removed, they can cause serious wear and damage. No matter which medium it cleans, an optimized and well-designed onboard treatment system should ensure:

- Removal of both water and solids in one operation
- Effective removal of even small particle sizes
- Minimal maintenance, enabling more process uptime
- Extended equipment lifetime
- Low total cost of ownership (TCO)

Technology makes a difference

Fishing vessels can choose from a number of treatment technologies. Lube oil, for example, can be cleaned with filters, coalescers or centrifugal separators.

Filters capture particles in disposable cartridges. The cartridges need regular replacing, as they only have capacity to hold a limited volume of solids. Coalescers, on the other hand, work only when the medium is nearly particle-free. Most often, they are used in combination with filters to create a system for removing both solids and water.

Only centrifugal separators can remove both particles and water on their own. Water contamination is continuously discharged, while the particles are contained within the separator bowl for later disposal or automatic discharge. All the while, clean oil is directed back into your process.

Separators for fishing vessels

Alfa Laval provides a wide range of fuel and lube oil cleaning solutions based on centrifugal separation. Among them are the Alfa Laval MIB503, MMB304/305, P605/615 and Emmie separators, which are an ideal fit for vessels with installed power up to 5.5 MW. That includes the majority of fishing vessels. The MIB503, MMB304/305 and Emmie separators belong to Alfa Laval's family of solid-bowl separators, while P separators are self-cleaning solutions designed for automatic operation.

Application

- Marine gas oil
- Marine diesel oil
- Lubrication oil
- Hydraulic oil

MIB 503

A highly efficient and compact separation solution

MIB 503 separation system

Alfa Laval MIB 503 systems and modules offer a highly efficient and compact separation solution. They improve the reliability of fuel and oil systems and protect your engine from serious wear and damage.

Applications

- Marine gas oil
- Marine diesel oil
- Lubrication oil

Design

MIB 503 systems and modules are available in gas oil, diesel oil or lube oil configurations.

The MIB 503 separator has a solids-retaining bowl that can operate as both a purifier and a clarifier. Its unique drive technology is based on an electric motor mounted directly to the bowl, controlled by a frequency converter.

MIB 503 systems are delivered as loose components, including the separator and the ancillary kit with flexible inlet and outlet hoses.

The following optional equipment is available:

- A control cabinet with an integrated frequency converter to start/stop the separation process as well as troubleshoot alarms
- A positive displacement pump with constant flow, which is connected to the separator through the standard flexible hoses
- A pressure switch kit to indicate if the water seal interface is lost
- A collecting tank with an integrated level sensor to protect the system from overflow
- A heater block including an Alfa Laval CBM plate heat exchanger or an Alfa Laval EHM electric heater of 7 kW or 14 kW. The heater block is also equipped with a three-way valve and a temperature switch that allow the system to warm up the oil by running in recirculation mode
- A transformer from 100/110 V or 400/440 V to 230V
- A drip tray to collect oil leakage
- An emergency stop button

MIB 503 modules are complete separation solutions that include the separator and all necessary equipment, built on a common skid and ready for plug-and-play installation.

Benefits

- Easy installation and start-up
- Easy operation
- Superior water and particle removal capability
- Low operating costs
- Small footprint and low weight

MIB 503 separation modules

Dutch fishing vessel Prins Maurits and the MIB 503

Chief Engineer Auke van Slooten on the operational and financial benefits of using an Alfa Laval MIB 503 module:

"Normally, with our main engine, we can drive on lube oil for one year. Then we must change 1,400 litres. We've tried filters, but filters were not capable of removing the dirty parts from the oil. Now, with the new [Alfa Laval MIB 503] separator, we have the oil inside for almost two years, and it's clean. The new separator is working so good that we can keep the lube oil in the engine for two years. 1,400 litres, and it's 3.5 euros for one litre, so it's a lot of money.

"It's a very easy separator. If we clean the separator, it takes 10 minutes of my time. That's very good, because if we are in the harbour, it's very busy – and we need our time. […] 10 minutes, it's very good. I remove the dirty oil , I clean the disc stack, I put it back on the separator and then I'm finished. I can use my time to do other things. So with this separator, it's very good."

C/E Auke van Slooten explains operational and financial performance

Summary

- Doubled lifetime of lubricating oil
- Yearly savings: (1,400 x €3.5) / 2 = €2,450
- Minimized maintenance time
- Easy operation

MMB 304/305

Robust and reliable separation of mineral oils

Alfa Laval MMB 304/305 separators belong to Alfa Laval's belt-driven family of separators for cleaning fuel and lube oil. They provide a long lifetime of service and protect your engine from serious damage.

Applications

- Marine gas oil
- Marine diesel oil
- Lubrication oils

Design

The MMB series of solids-retaining separators comprises two models, the MMB 304 and MMB 305, which can operate as both purifiers and clarifiers.

MMB systems include the separator, the pump, the inlet block, the outlet block, the flexible hose kit, the control cabinet and the emergency stop box.

The pump block consists of a positive displacement pump and an electric motor. The inlet block is mounted on the pump, and it is delivered with a ball valve, a strainer to protect the system from large particles, a non-return valve and a pressure gauge. The outlet block is positioned in the oil outlet of the separator and consists of a non-return valve, a pressure switch, a pressure gauge and a regulating valve to control the system back pressure. The pressure switch triggers an alarm if the water seal is lost during operation.

All functions and alarms are handled from the control cabinet.

MMB separation module

MMB separation system

In addition to the standard configuration, the following equipment can be selected as options:

- A heater block comprising an Alfa Laval CBM heat exchanger, a three-way valve and two temperature switches to ensure the right separation temperature during operation
- A drip tray installed in the bottom of the frame to collect any media leakage that may occur
- A collecting tank installed after the sludge outlet of the separator with an integrated level switch. The level switch will trigger an alarm if overflow occurs during operation
- A flow regulation kit with a regulation valve that is installed in the module's inlet block

MMB modules are complete separation solutions that include the separator and all necessary equipment, built on a common skid and ready for plug-and-play installation.

Benefits

- Easy installation and start-up
- Easy operation and maintenance
- Superior water and particle removal capability
- Low operating costs
- Robust and reliable design

P605/P615

Cleaning systems for lubricating and lighter fuel oils

Alfa Laval P605/615 separators belong to the Alfa Laval S and P Flex range of separators. They are based on purifier technology, which means the oil/water interphase is manually adjusted by means of a gravity disc.
P separators are self-cleaning and designed for automatic operation at sea.

Applications

- Distillate fuels
- Lighter residual fuels
- Lubrication oils

Design

The S and P Flex concept provides a wide range of alternatives for P separators. Depending on the need, P separators can be supplied as systems of loose components or as customized modules.

In a P Flex system, a P separator with ancillaries in the form of optimized block components provides full say over the use of space. This allows for local modularization or do-it-yourself assembly.

P Flex system

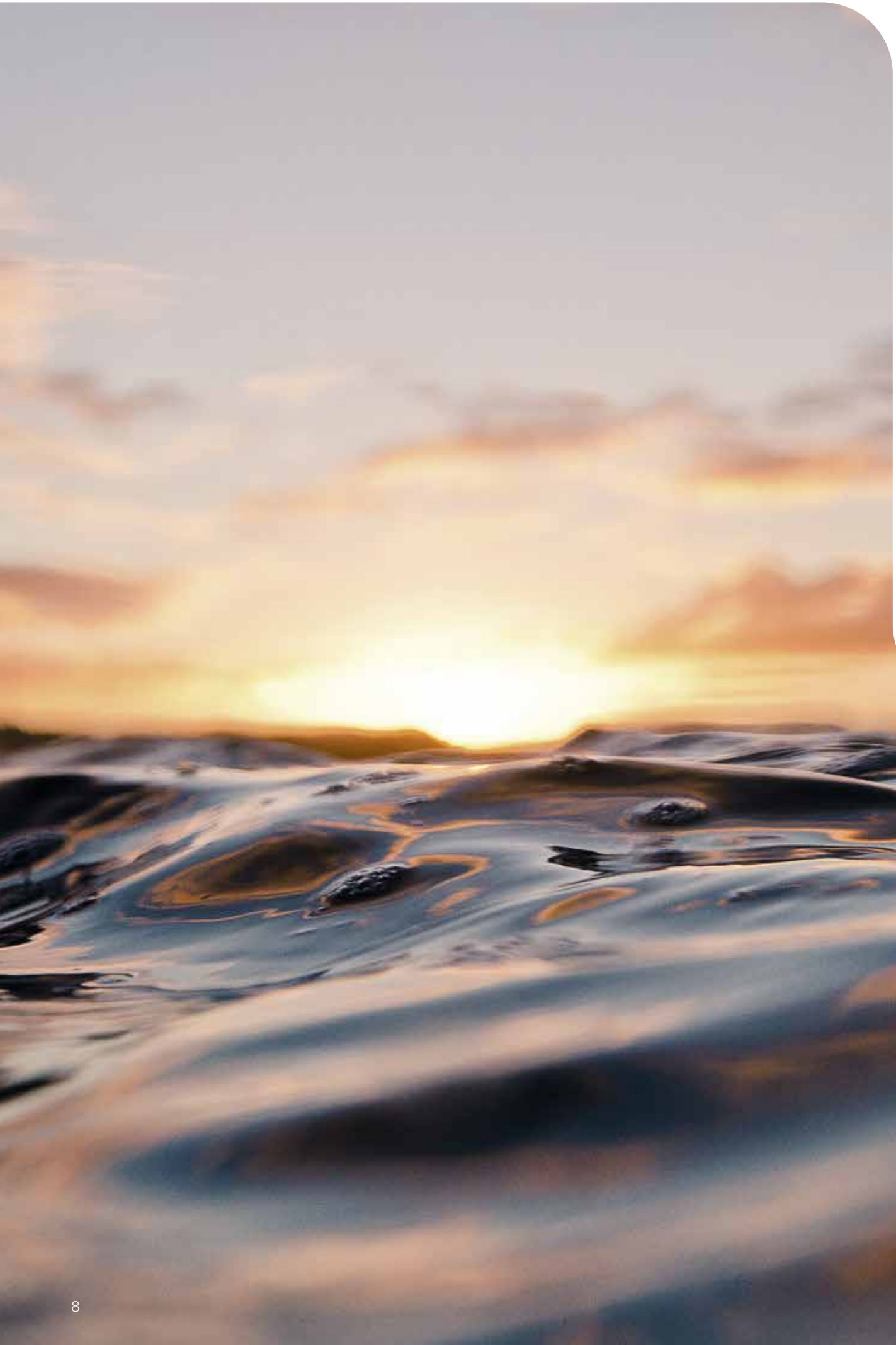
Water block

P Flex module

A P Flex module is a compact separator module that can be built to a customer-specified configuration from a wide range of modular skids and blocks, including any type of heater and a sludge removal kit. Multi-modules are possible, as well as mixed modules including one or more P separators for the simultaneous treatment of different types of mineral oils. All P Flex modules are factory tested to ensure faster start-up and commissioning.

Benefits

- Small footprint, high flexibility
- Simple installation
- Superior water and particle removal capability
- Low oil loss
- Easy operation and service
- Remote monitoring
- Cleaning in Place (CIP)



Emmie

Mobile hydraulic oil cleaning system

The Alfa Laval Emmie system is a mobile cleaning solution for hydraulic oil, comprising a trolley-mounted centrifugal separator and a mobile electric oil heater. Wheeled between hydraulic systems, it removes water and 99% of all particles in the 2–5 µm size range.

Applications

- Bow, stern and azimuth thrusters
- CP propellers
- Deck cranes
- Winches
- Hoistable decks
- Hatch covers
- Ramps
- Steering gear
- Stabilizers
- Hydraulic lifts
- Deep well pumping systems for product/chemical tankers
- Stern tube lube oil
- Thermal oil

Separator trolley
Weight: 64 kg without transformer
72 kg with transformer
Length: 620 mm
Height: 1,100 mm
Width: 515 mm

Emmie – mobile hydraulic oil cleaning system

Design

The Emmie system is designed for easy wheeling from tank to tank, with a compact design that allows access to confined spaces. Its direct-driven, solids-retaining separator is mounted on a stainless-steel trolley, which has sledge runner handles that let it slide easily down ladders. The other part of the system is a mobile electric preheater.

The trolley is equipped with a built-on screw pump, a collecting tank and control equipment. A set of standard hydraulic hoses with quick-release couplings and non-return valves is also included in the scope of delivery.

The Emmie system connects to a hydraulic oil tank in minutes, and its combined suction and return pipe includes an air/dust filter. The separator, pump and heater operate on single-phase 110 or 240 V AC, so the system can simply be plugged in and switched on. Two separator bowl options are available, allowing the separator to operate in either clarifier or purifier mode.

Benefits

- Installation-free start-up
- Superior water and particle removal capability
- Drastic increase in hydraulic system reliability and availability
- Extended hydraulic oil lifetime
- Reduced filter cartridge consumption
- Less contaminated oil and fewer filter cartridges for disposal

Newbuild – separators vs filters

Application and conditions

- ME: Wartsila 8V31DF (MCR: 4,800 kW @ 750 rpm)
- Required MDO and LO flow through the separator/ filter: 1,800 l/h
- Estimated solids content: 25 ppm
- Generation rate for solids volume: 0.03 l/h
- MDO price: €442/MT
- LO price: €2.5/l
- Electric power cost: €0.18/kWh
- Sludge disposal cost: €100/m^3
- Water cost: €3/m^3

MDO, off-line fine filter

Yearly cost of filter elements

- No. of filter elements: **3**
- Dirt holding capacity: 3 x 2.5 = 7.5 l
- **Exchange interval** of filter elements @ 75% operational time: 20 days ≈ **3 weeks**
- **Yearly cost of filter elements** @ €93/pc: **€5,022**

* Source: CJC™ Product Sheet

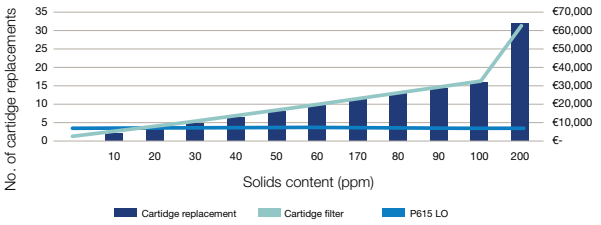
LO, off-line fine filter

Yearly cost of filter elements

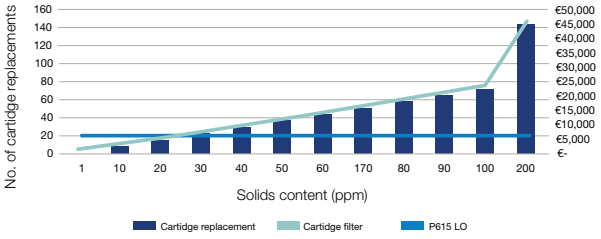
- No. of filter elements: 12
- Dirt holding capacity: 12 x 2.8* = 33.6 l
- Exchange interval of filter elements @ 75% operational time: 92 days ≈ **3 months**
- **Yearly cost of filter elements** @ €200/pc: **€9,600**

* Source: CJC™ Product Sheet

Yearly OPEX



	P615 LO	Cartridge filter
Parts & service	€2,445	€9,600
Electric energy	€2,106	€1,419
Oil losses	€488	€555
Fresh water	€41	-
Sludge/waste disposal	€1,879	€444
OPEX, 1 yr	**€6,959**	**€12,018**



	P615 MDO	Cartridge filter
Parts & service	€2,389	€5,022
Electric energy	€1,989	€1,123
Oil losses	€86	€96
Fresh water	€33	-
Sludge/waste disposal	€1,732	€503
OPEX, 1 yr	**€6,229**	**€6,744**

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 to access the information.

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