

Alfa Laval P separators 626/636/646

Cleaning systems for lubricating, diesel and hydraulic oil applications



Introduction

Alfa Laval's P Flex separation systems combine the high efficiency, low sludge output and low operating cost of Alfa Laval centrifugal separators with a flexible scope of supply. Extensive possibilities for the separation system layout and assembly make it possible to suit any installation and any oil separation application.

In addition, P Flex separation systems feature the EPC 60 controller, which enables the intuitive navigation of menus, parameters and alarms. The EPC 60 controller also has a modular construction for easy I/O board addition and replacement.

The P Flex separation concept includes the complete P separator range. Separators of different sizes can be combined into one module, including both fuel and lube cleaning, even within a single customer specified module.

Application

P separators are based on purifier technology, which means that the oil/water interphase is manually adjusted by means of a gravity disc. The separators are suitable for economical cleaning of the following:

- Lubrication oils
- Distillate fuels
- Biofuels
- Residual fuels

P separators efficiently remove water and particles from lubrication oils used in trunk-piston and cross-head engines.

P separators clean distillate and residual fuels according to ISO 8217, including ultra-low, very-low and high sulphur fuel oils (ULSFO, VLSFO and HSFO) with densities up to 991 kg/m³ at 15°C and viscosities up to 700 cSt at 50°C.

The P separator is optimized to clean biofuels according to EN15940 (HVO) and EN14214/ASTM D6751 (FAME). For treatment of other fuel types please consult your local Alfa Laval office.

P separators are designed for automatic operation in periodically unmanned engine rooms at sea and in power stations ashore.

Benefits

- *Small footprint, high flexibility* — The small separator and the modular nature of the surrounding components allow easy installation and flexible positioning in the engine room.
- *No water tank* — No tank is needed to supply operating water, which further simplifies installation.
- *High separation efficiency* — An optimized design ensures the best possible separation efficiency from the bowl and disc stack.
- *CentriShoot* — The CentriShoot discharge system greatly reduces sludge volumes. Its fixed discharge side flexes gently to expose the discharge ports, thereby eliminating metal-to-metal wear.
- *CentriLock* — The CentriLock bowl-locking system uses a lightweight, non-threaded snap ring. This prevents wear by allowing easy removal without a sledgehammer.
- *Long service intervals* — Wear-preventing features like CentriShoot and CentriLock reduce the consumption of spare parts and allow planned maintenance to be performed less often. This reduces operating costs.
- *Easy operation and service* — The PLC based EPC 60 controller is designed for “one-button” starts and stops, as well as intuitive menu navigation. Information about parameters and alarms can be easily accessed, which simplifies both operation and troubleshooting. The EPC 60 also has an interchangeable and flexible design that enables faster troubleshooting and I/O board replacement.
- *Remote control and monitoring* — Using Ethernet or MODBUS communication, Flex systems and modules based on P separators 626/636/646 can be operated and supervised remotely from the control room. A variety of alarm functions are available as standard. Extra I/O boards can be added to the EPC 60 controller in order to enhance its operating and monitoring capabilities.

Design



1. **Single Flex module** with separator, heater and pump
2. **Quadruple Flex module** with separators, heaters and pumps

The P Flex separation concept provides a wide range of alternatives for P separators. Depending on the need, a P separator can be supplied as a separator and ancillaries, as a customer-specified module, or as part of a comprehensive package including services and order specific documentation.

Flex system

A P separator with ancillaries in the form of block components provides optimized use of space. This allows for local modularization or do-it-yourself assembly.

Flex modules

A compact P separator module can be built to a customer-specified configuration from a wide range of modular skids and machine blocks. Multi-modules are possible, as well as mixed modules including one or several S separators and/or P separators for the simultaneous treatment of different types of mineral oils. All Flex modules are factory tested to ensure faster startup and commissioning.

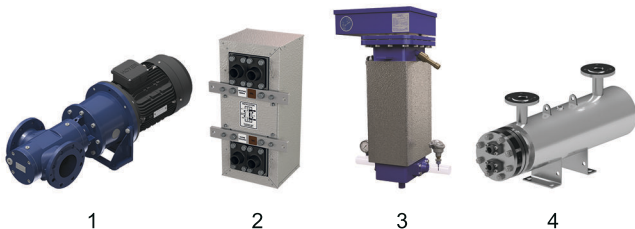
Scope of supply

Preventive maintenance procedures are handled quickly and simply with the help of a compression tool. The snap ring of the patented CentriLock bowl-locking system is non-threaded and requires only an Allen key to remove.

- Maintenance intervals:
 - Inspection Service every 4 000 h or 6 months
 - Overhaul Service every 12 000 h or 18 months

- Service spares kits contain all necessary spare parts for each service and maintenance checkpoint:
 - Inspection Kit with O-rings and seals for separator bowl.
 - Overhaul Kit with parts for drive system, belt, bearings and pads. Also contains an Inspection Kit.
 - Support Kit with strategic spares for operation and maintenance backup.
- The System Manual includes detailed information in electronic or printed form:
 - Installation instructions
 - Operating instructions
 - Alarms and troubleshooting
 - Service and spare parts
- Commissioning and technical services including start-ups, are available from all Alfa Laval offices.
- All services can be incorporated into specially tailored Nonstop Performance packages. Details are available from local Alfa Laval offices.

Options



Feed pump options

1. ALP feed pump with IE3 motor
2. HEATPAC CBM heater
3. HEATPAC EHM heater
4. S&T Heat exchanger

Flex separation systems based on P separators 626/636/646 can be complemented with the following equipment:

- Starter (included in module versions)
- Heater
- Heater control board in EPC 60 controller
- Space heating
- Additional thermometers
- Vibration sensor kit
- ALP Feed pump
- Flow regulating system
- Sludge removal kit
- Sludge outlet butterfly valve kit
- Pressure indicators
- Root valves for PI
- Needle valves
- Steam shut-off valve kit
- Air pressure reducer valve
- Special cable glands, extended cables
- Tailored pipe arrangement for multiple modules, including heater cross-connection
- Emergency safety shutdown
- Remote monitoring and control
- Separator lifting tool

Working principle

The P Flex separation systems based on P separators 626/636/646 are operated automatically by the EPC 60 controller. Untreated oil, heated to the correct temperature, is fed continuously to the separator. The separator is driven by an electric motor via a friction clutch and belt.

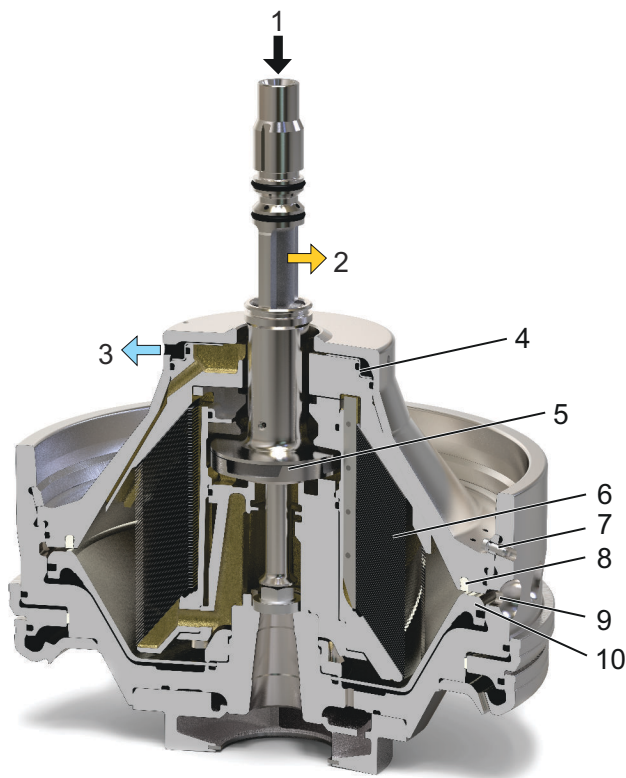
The separator bowl is fixed at the top of a spindle, which is supported by bearings and special composite springs. This bowl can be arranged as a purifier or as a clarifier. Both configurations remove sludge, which accumulates at the bowl periphery and is intermittently discharged by the high-precision CentriShoot discharge system.

In a purifier configuration, both sludge and water are separated from the oil, which means that water is continuously discharged from the bowl. The EPC 60 controller automatically controls the admission of water for the water seal and the displacement of oil prior to sludge discharge, but a gravity disc is needed to establish the correct interphase position in the separator bowl, i.e. the boundary between the oil and the water seal. The size of the gravity disc must be matched to the oil's density, viscosity/temperature and feed rate to the separator.

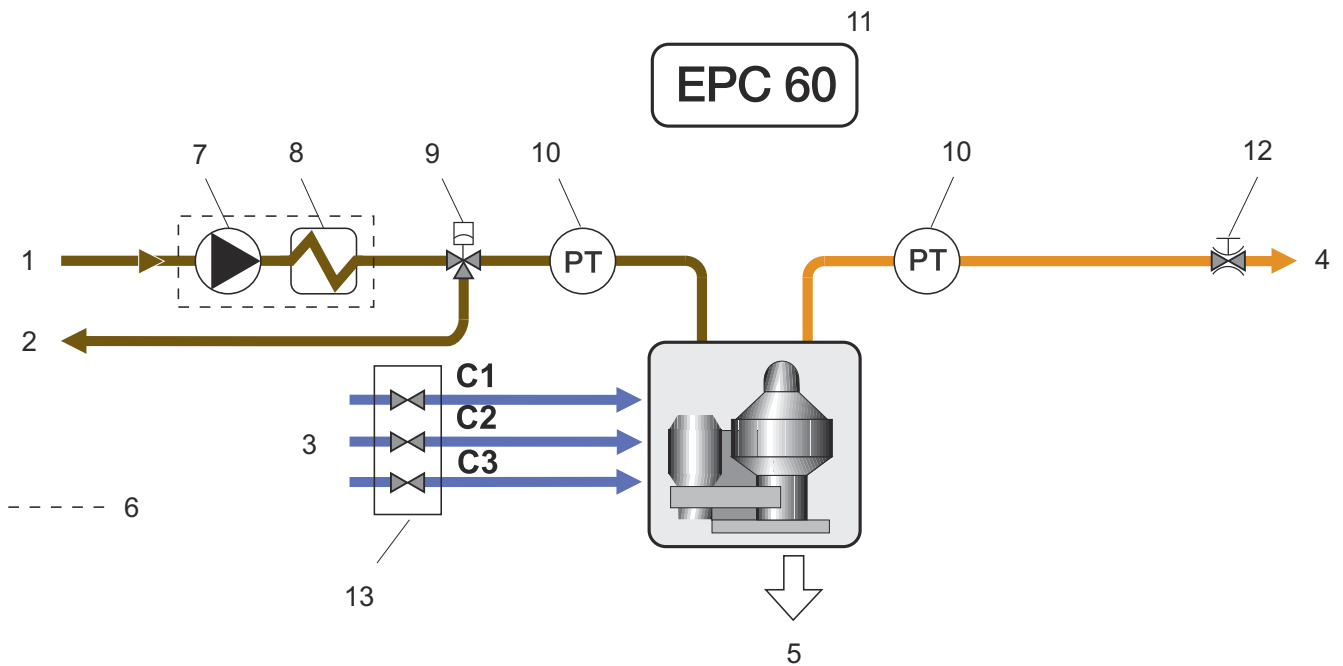
In a clarifier configuration, a clarifier disc is fitted instead of a gravity disc. The water outlet is blocked, which means that the separator's water-handling capacity is limited and that water accumulates like sludge.

During normal operation, vital process parameters are monitored. These parameters, as well as alarms, are indicated by easy-to-understand text messages on the LCD display of the EPC 60 controller.

The EPC 60 controller provides many alarm functions, including alarms for low oil pressure, high sludge tank level (if the optional sludge removal kit is included) and power failure. Additional functions are available for a vibration alarm when the optional vibration sensor is fitted.

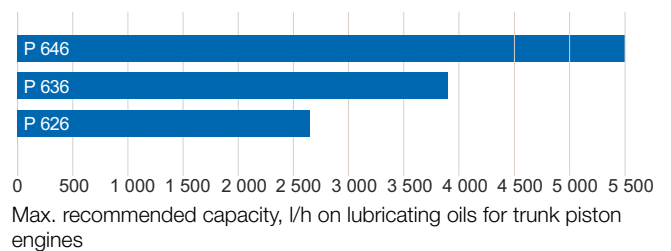


1. Untreated oil
2. Clean oil
3. Separated water
4. Gravity disc
5. Paring disc
6. Disc stack
7. CentriLock
8. Seal ring
9. Discharge port
10. Discharge slide



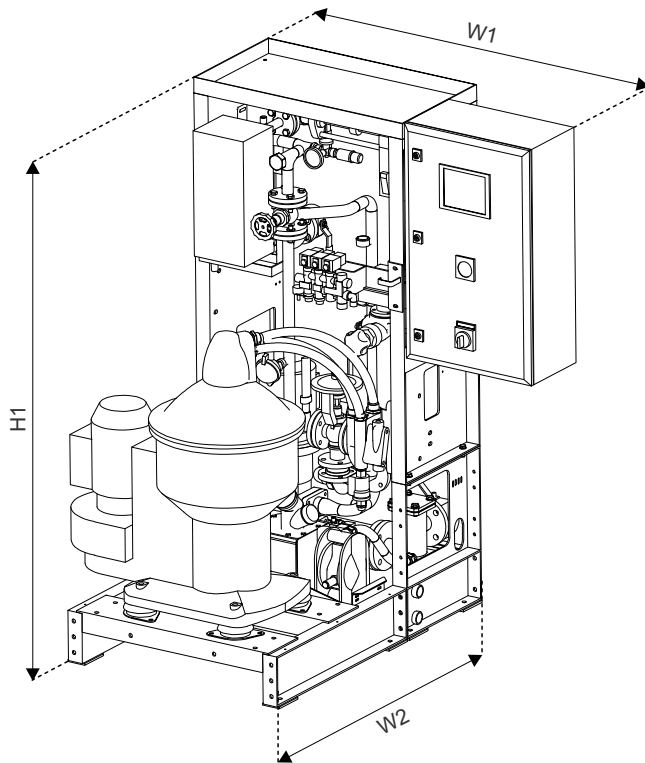
1. Untreated oil inlet
2. Oil return
3. Water inlet (C1 = Conditioning water, C2 = Opening water, C3 = Closing water)
4. Clean oil outlet
5. Sludge and water outlet
6. Optional
7. Feed pump
8. Heater
9. Pneumatically controlled change-over valve
10. Pressure transmitter
11. Control unit
12. Regulating valve
13. Solenoid valve block, water

Technical data



Technical data	
Main supply voltage	3-phase, 220 V up to 690 V
Control voltage	1-phase, 100/110/115/230 V
Frequency	50 or 60 Hz
Control air	Min 5 bar, max 8 bar
Operating water pressure	Min 2 bar, max 8 bar

Dimensional drawing



Flex module with CBM heater

Type	Size (H1 x W1 x W2)	DN	Net weight (kg) ¹
P 626	1650 x 1200 x 1100	25	825
P 636	1650 x 1300 x 1220	25	830
P 646	1650 x 1300 x 1220	25	1010
P 646	1900 x 1450 x 1450	40/50	1210

¹ Including ALP feed pump, CBM heater and SRK

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