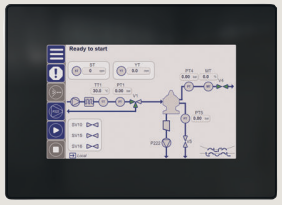
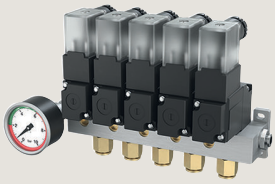
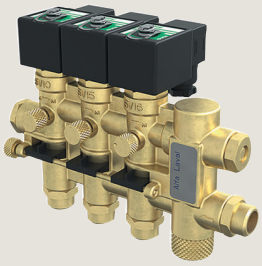
Alfa Laval P separators 605/615/617

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.

The P Flex separation systems feature the new and improved EPC 70 controller, which fulfils the requirements on cyber security. EPC 70 enables easy navigation of menus, parameters, and alarms. It has a modular construction for easy upgrade of additional functionality.

Included in the Flex separation concept are all S separator models and P separators P separators 605/615/617 , whose mechanical platform includes CentriLock and CentriShoot, as well as P separators P separators 605/615/617 . These can be combined in mixed sets, even within a single customer-specified module.

Application

P separators P separators 605/615/617 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
  - LO general
  - LO detergent type
  - LO morg oil/gear box (EP additives)
  - LO paper machines bearings
- Diesel oil
- Hydraulic oil

For treatment of other oil types, please consult your local Alfa Laval office.

If the oil is well defined and does not vary in density, P separators P separators 605/615/617 can also be manually adjusted to clean heavy and viscous oils.

Benefits

- *Small footprint, high flexibility* — The small separator and the modular nature of the surrounding components allow easy installation and flexible positioning in the work shop.
- *No water tank or discharge pipe* — No tank is needed to supply operatingwater, and no pipe is needed to discharge it. This further simplifies installation.
- *Separate feed pump* — A separate feed pump reduces pipework to and from the preheater.
- *High separation efficiency* — An optimized design ensures the best possible separation efficiency from the bowl and disc stack.
- *Efficient displacement* — The separator's highly efficient displacement ensures that virtually no oil is lost.
- *Effective discharge* — Separated sludge and water are efficiently removed from the system.
- *Easy operation and service* — The PLC based EPC 70 controller is designed for "one-button" starts and stops, as well as easy menu navigation. The 5 inch touch screen comes with 11 languages including Chinese, Japanese and Korean. Information about parameters and alarms can be easily accessed, which simplifies both operation and troubleshooting.
- *Remote control and monitoring* — Using Ethernet communication, Flex systems and modules based on P separators can be operated and supervised remotely from the control room. A variety of alarm functions are available as standard, and extra I/O boards can be added to the EPC 70 controller in order to further enhance its operating and monitoring capabilities. Future proof design — The EPC 70 control system has a new, more powerful CPU which provides better processing capacity. It is prepared for integrated communication with other systems and Alfa Laval connected services.
- *Bio-based oil ready* — The separator is updated with additional gravity discs to process low density biofuels.
- *Cyber security* — The EPC 70 control system is cyber secure with the required security profile for marine separators. Alfa Laval experts are ready to support when needed.

Design

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1. Single Flex module with separator (excluding heater and pump)
2. Single Flex module with separator, heater and pump
3. Quadruple Flex module with separators, heaters and pumps

The P Flex separation concept provides a wide range of alternatives for P separators 605/615/617 . Depending on the need, a P separator P separators 605/615/617 can be supplied as a separator and ancilliaries, as a customer-specified module, or as part of a comprehensive package including services and order specific documentation.

P 605/615/617 system (block components) — A P separator P separators 605/615/617 with ancilliaries in the form of block components provides optimized use of space. This allows for local modularization or do-it-yourself assembly.

P 605/615/617 Flex modules — A compact P separatorP separators 605/615/617 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 626/636 for the simultaneous treatment of different types of mineral oils. All Flex modules are factory tested to ensure faster start-up and commissioning.

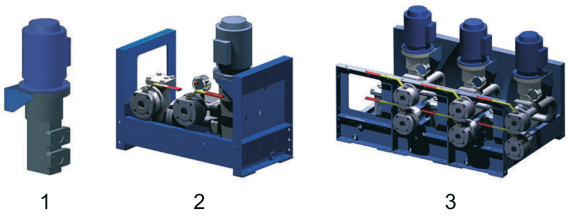
Scope of supply

A preventive maintenance programme using Alfa Laval Service Kits ensures safe and easy maintenance.

- Recommended maintenance intervals:
  - Intermediate Service every 2000 h or 3 months
  - Major Service every 8000 operating hours or 12 months

- Service kits contain all necessary spare parts for each service and tips for maintenance at regular intervals:
  - Intermediate Service Kit with O-rings and seals for separator bowl, inlet and outlet.
  - Major Service Kit with parts for drive system, belt, bearings and friction pads.
- 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 startup assistance and advice on operation and maintenance, are available from all Alfa Laval offices.
- Training in all aspects of oil treatment, freshwater generation and heat transfer is available.
- All services can be incorporated into specifically tailored Nonstop Performance packages. Details are available from local Alfa Laval offices.

Options

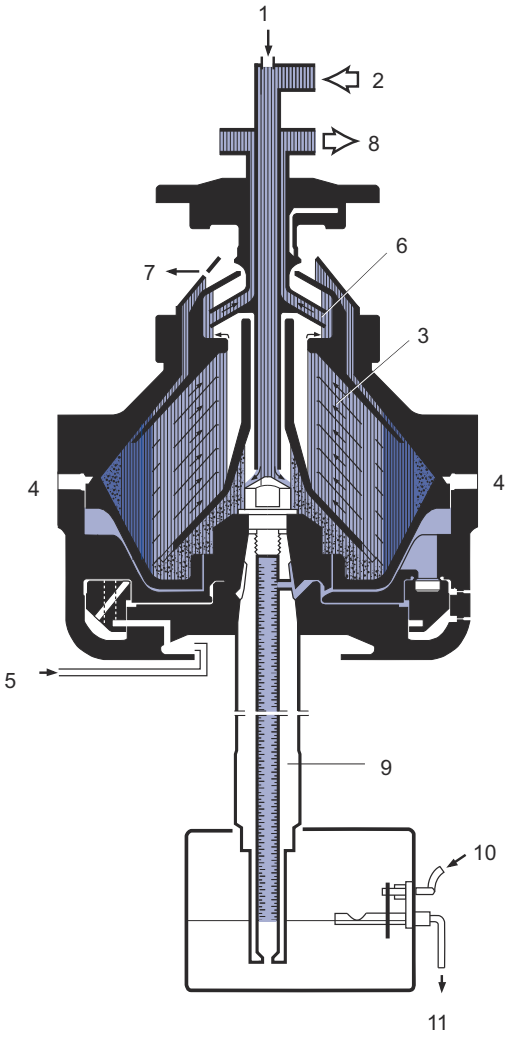


1. Pump delivered separately
2. Pump mounted on skid
3. Pump module, 3 skids mounted together

Flex separation systems based on P separators 605/615/617 can be complemented with the following equipment:

- Starter (always included in module version)
- Feed pump
- Strainer
- Heater
- Space heating
- Temperature transmitter
- Additional thermometers
- Safety valve
- Pressure transmitters
- Steam shut-off valve kit
- Sludge removal kit
- Regulating valves
- Needle valves
- Air pressure reducer valve
- Vibration switch
- Flow regulating system
- Sludge outlet valve kit
- Emergency safety shutdown
- Remote monitoring
- Special cable glands, extended cables
- Tailored pipe arrangement for multiple modules, including heater cross connection

Working principle



1. Water seal and discplacement water inlet
2. Oil inlet
3. Disc stack
4. Sludge outlet
5. Opening water
6. Paring disc
7. Water outlet
8. Oil outlet
9. Bowl spindle
10. Bowl closing water
11. Overflow

The P Flex separation systems based on P separators 605/615/617 are operated automatically by the EPC 70 controller, except at startup of the separator. 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.

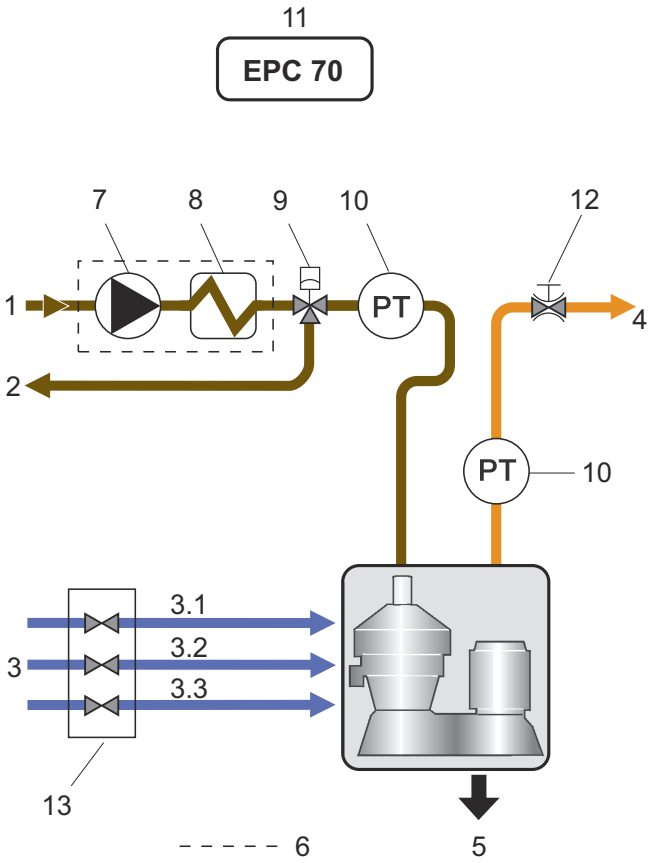
In a purifier configuration, both sludge and water are separated from the oil, which means that water is

continuously discharged from the bowl. The EPC 70 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.

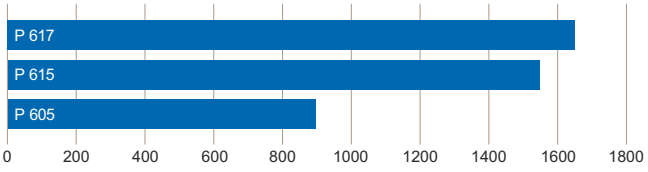
During normal operation, vital process parameters are monitored. These parameters, as well as alarms, are indicated by easy-to-understand text messages on the LCD display of the EPC 70 controller.

The EPC 70 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 switch is fitted.

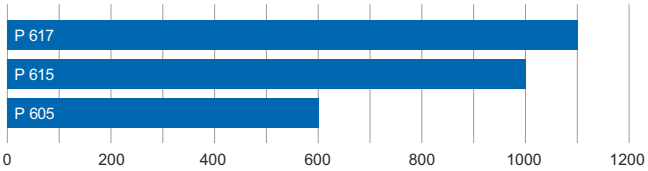


1. Untreated oil inlet
2. Oil return
3. Water inlet
3.1 Conditioning water
3.2 Opening water
3.3 Closing water
4. Clean oil outlet
5. Sludge and water outlet
6. Optional
7. Feed pump
8. Heater
9. Pneumatically controlled change-over valve
10. Pressure transmitter
11. Control unit
12. Regulating valve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

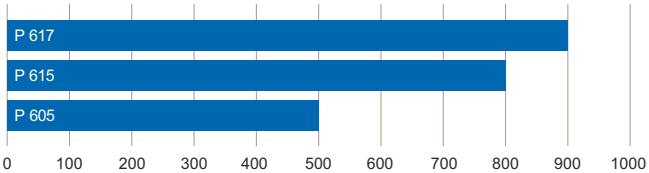
Technical data



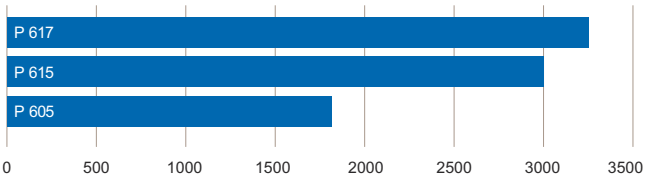
Lube oil, ISO VG 100	
Viscosity at 40°C (cSt):	100
Viscosity at separation temperature (cSt):	20
Required separation temperature (°C):	80



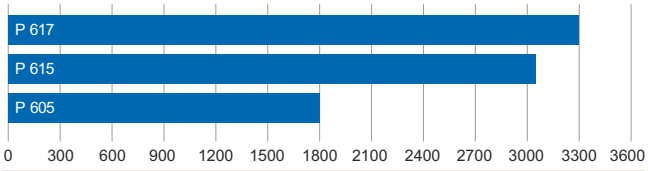
Lube oil, ISO VG 460	
Viscosity at 40°C (cSt):	460
Viscosity at separation temperature (cSt):	31
Required separation temperature (°C):	95



Lube oil, ISO VG 680	
Viscosity at 40°C (cSt):	680
Viscosity at separation temperature (cSt):	39
Required separation temperature (°C):	95



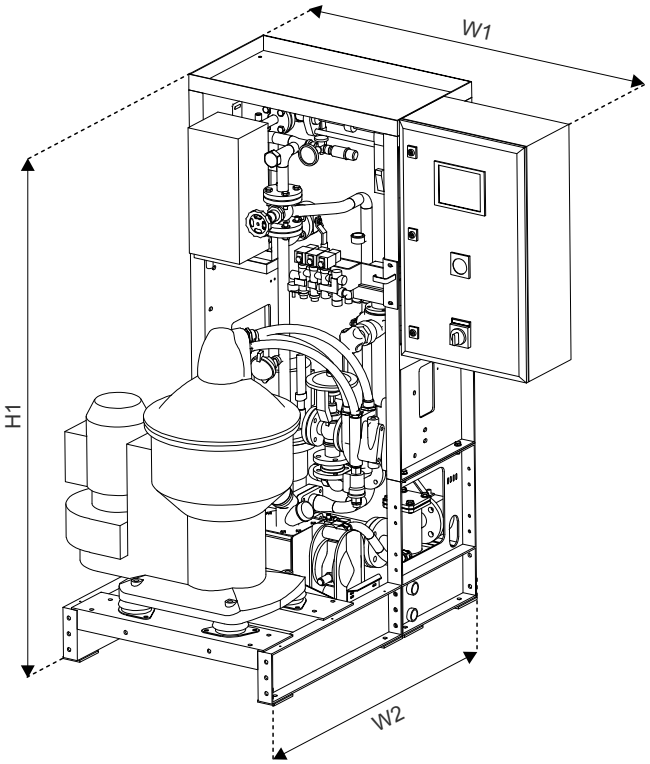
Lube oil, Neat cutting oil	
Viscosity at 40°C (cSt):	12
Viscosity at separation temperature (cSt):	5
Required separation temperature (°C):	75



Marine diesel oil	
Viscosity at 40°C (cSt):	13
Viscosity at separation temperature (cSt):	13
Required separation temperature (°C):	40

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 605	1650 x 1200 x 1100	25	610
P 615	1650 x 1200 x 1100	25	610
P 617	1650 x 1200 x 1100	25	610

[1] Including ALP feed pump, CBM heater and SRK

How to contact Alfa Laval

Up-to-date Alfa Laval contact details for all countries are always available on our website at www.alfalaval.com