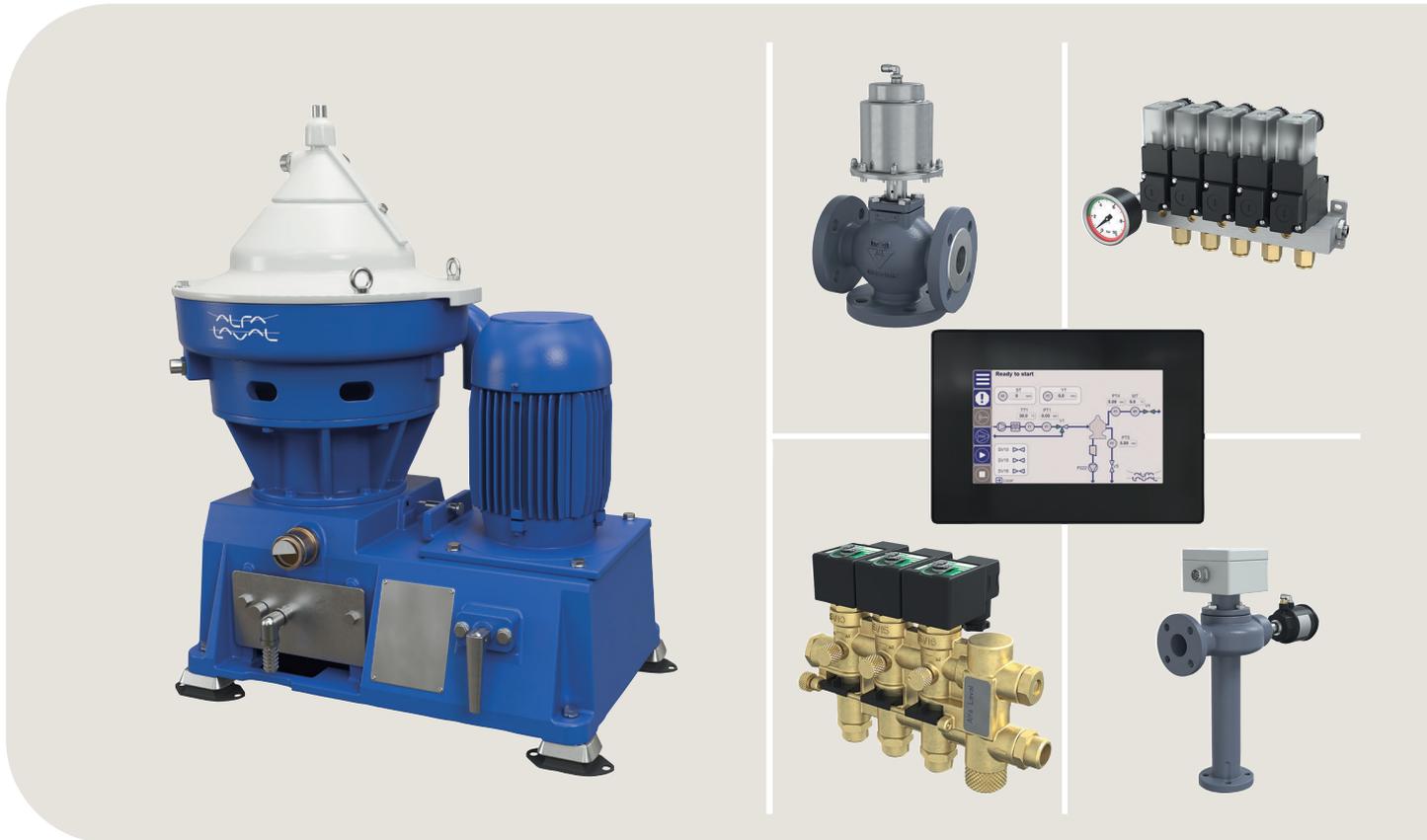


Alfa Laval S separators 805/815/817

Cleaning systems primarily for residual fuel oils



Introduction

Alfa Laval's S 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 engine room and any oil separation application.

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

The S Flex separation concept includes the complete S 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

S separators are based on Alcap technology, which means they detect when the oil/water interphase moves into the disc stack and automatically activates the drain or discharge mechanism and thereby maintain best possible performance at all times. This makes them particularly suitable for separating fuels and oils with varying density and viscosity, though they can be used to clean all of the following:

- Residual fuels
- Distillate fuels
- Biofuels
- Lubricating oils

S separators efficiently 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 1 010 kg/m³ at 15°C and viscosities up to 700 cSt at 50°C.

They are also optimized to clean fuels that meet ISO 8217 specifications and comprise FAME or HVO in any blend ratio, so long as:

- FAME at the time of blending meets EN 14214 or ASTM D6751 requirements
- HVO at the time of blending meets EN 15940 requirements

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

S 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.
- *Alcap technology* — A water transducer in the clean oil outlet automatically adjusts the oil/water interphase to different fuel densities and viscosities, and hence maximizes separation performance.
- *High separation efficiency* — An optimized design ensures the best possible separation efficiency from the bowl and disc stack.
- *Simple installation* — No tank is needed to supply operating water and no pipe is needed to discharge it, which further simplifies installation.
- *Separate feed pump* — A separate feed pump reduces pipe-work to and from the preheater.
- *Low oil loss* — The separator's highly efficient displacement ensures that virtually no oil is lost.
- *Efficient 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 S 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.
- *Biofuel ready* — The control system includes the latest, updated software including settings for biofuels operation.
- *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



Single Flex module with separator (excluding heater and pump)

The S Flex separation concept provides a wide range of alternatives for S separators. Depending on the need, an S 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

An S 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.

Flex modules

A compact S separator module can be built to a customer-specified configuration from a wide range of modular skirts and machine blocks. Multi-modules are possible, as well as mixed modules including one or more 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 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

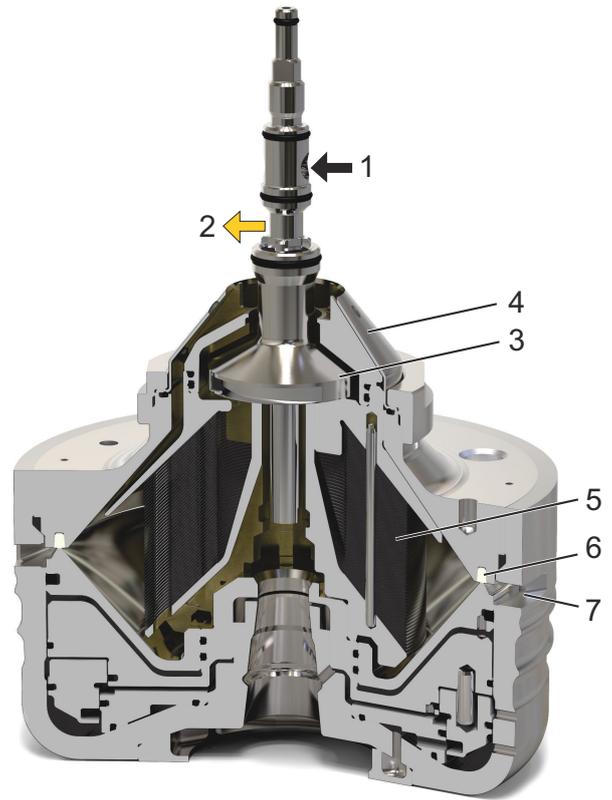


1. ALP feed pump with IE3 motor
2. HEATPAC CBM heater
3. HEATPAC EHM heater
4. S&T Heat exchanger

Flex separation systems based on S separators 805/815/817 can be complemented with the following equipment:

- Starter (included in module versions)
- Heatpac heaters
- Space heating
- Additional thermometers
- Vibration switch
- ALP feed pump
- Strainer
- Flow regulating system
- Sludge removal kit
- Sludge outlet butterfly valve kit
- Steam shut-off valve kit
- Air pressure reducer valve
- Pipe arrangement for multiple modules, including heater cross-connection
- Emergency safety shutdown
- Remote monitoring

Working principle



1. Untreated oil
2. Clean oil
3. Paring disc
4. Gravity disc
5. Disc stack
6. Seal ring
7. Discharge port

The S Flex separation systems based on S separators 805/815/817 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.

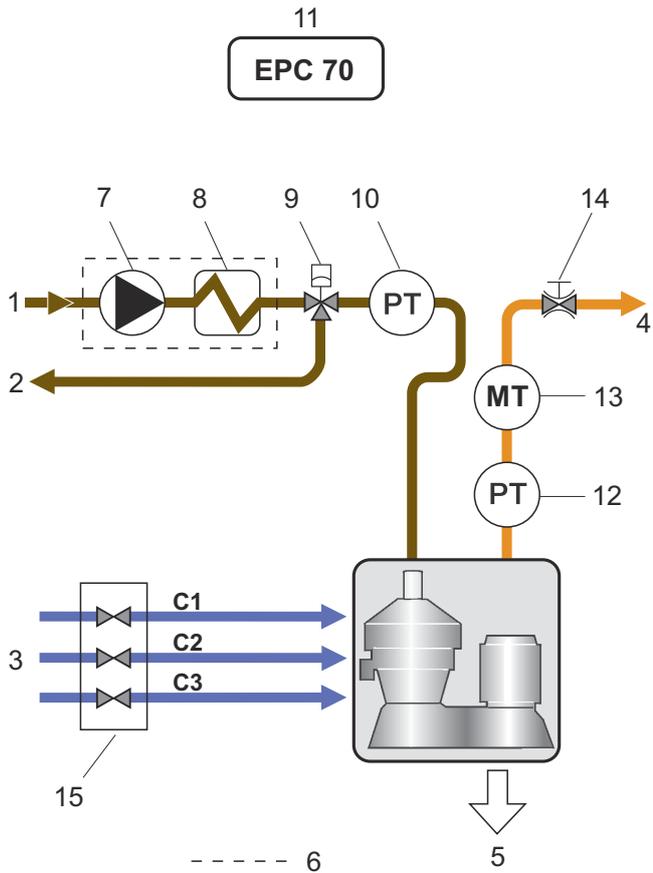
The separator bowl is fixed at the top of a spindle, which is supported by bearings and special composite springs. This bowl can be arranged as a purifier or as a clarifier. Both configurations remove sludge, which accumulates at the bowl periphery and is intermittently discharged.

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.

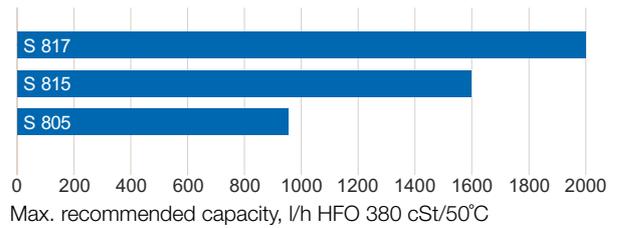
During normal operation, vital process parameters are monitored. These parameters, as well as alarms, are indicated on the HMI of the EPC70 controller.

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 (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, oil
11. Control unit
12. Pressure transmitter, oil
13. Water transducer
14. Regulating valve
15. Solenoid valve block, water

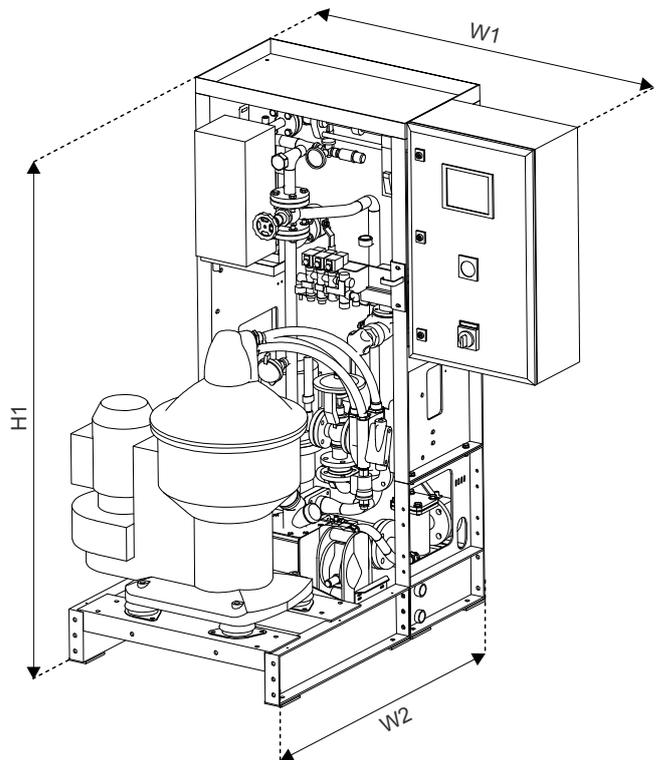
Technical data



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
S 805	1650 x 1200 x 1100	25	610
S 815	1650 x 1200 x 1100	25	610
S 817	1650 x 1200 x 1100	25	610

¹ Including ALP feed pump, CBM heater and SRK

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