



Purifier unit

Cleaning system for fuel and lube oils



Figure 1. Purifier unit

The Alfa Laval Purifier Unit is a fully integrated and modularised oil cleaning system with a low installation cost.

It is a small and compact system with well proven components.

Application

The Alfa Laval Purifier Unit is specifically designed for purification or clarification of mineral oils found in the marine and power industries.

- Heavy Fuel Oils with densities up to 991 kg/m^3 and viscosity up to $600 \text{ cSt/50}^\circ\text{C}$.
- Lubricating oils
- Distillate and light diesel oils (MDO).

The Purifier Unit (Fig. 1) is suitable for shipbuilders and ship operators in newbuilding applications; power plant builders and operators; diesel engine builders and in retrofit applications to replace or supplement existing cleaning systems.

Concept

The Purifier Unit combines a separator and its ancillary components, together with control system and starter box, in a fully integrated modular design on its own base plate. It can be further combined with a unit for heating and pumping to form a System Module.

More combinations of System Modules are also available, together with several more options to suit the installation or operators requirements:

• Sludge Removal Kit

A sludge handling system, which takes care of the discharged sludge and water with its own small tank and pump set.

• Heating Unit

A heater using steam, electricity, hot water or thermal oil plus a screw pump designed as a unit itself and connected to the Purifier Unit.

• Double System Module

Two complete separator systems, with their own heaters and pumps and interconnecting pipework, on a module base. Two configurations are available.

• Remote Supervision

The Purifier Unit can be supervised remotely from a control room using REMIND™ software.

Operating principle

The Purifier Unit is operated automatically by the EPC-50 control unit, except for starting the separator.

The separator bowl can be arranged as a purifier or as a clarifier.

A purifier separates sludge and water from the oil. Water is continuously discharged from the bowl. The sludge accumulated in the sludge space in both a purifier and a clarifier is intermittently discharged.

In a clarifier, the water outlet is blocked, i.e. the water handling capability is limited. Water is accumulated like sludge.

In the purifier mode, the EPC-50 unit automatically controls the water admitted to the separator for the water seal and displacement of oil prior to sludge discharge.

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 springs. The sludge is discharged to a small intermediate sludge tank. This means that the conventional sludge tank under the separator can be avoided. The Sludge Removal Kit takes care of the sludge by pumping automatically to the main sludge tank.

During normal operation vital process parameters are monitored. The EPC-50 unit provides alarm functions for low oil pressure, high intermediate tank level, and power failure. Alarm functions are also provided for errors involving the EPC-50 unit.

Special text messages indicate process parameters and alarms on the LED display. The EPC-50 and the starter box combine to form the Control Cabinet, which is type approved by many classification societies.

In addition, functions are available for vibration alarm when the optional vibration switch is fitted.

When operating in the purifier mode, a gravity disc must be fitted to obtain the correct interface position in the separator bowl, i.e. the boundary between the oil and the water seal.

The size of gravity disc must be matched to the oil density, viscosity/temperature, and oil feed rate to the separator. In the clarifier mode, a clarifier disc is fitted instead of gravity disc.

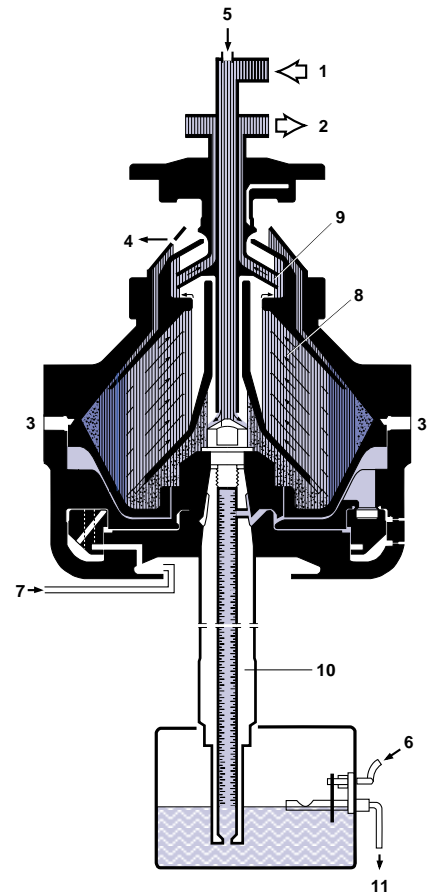


Figure 2. Separator bowl

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

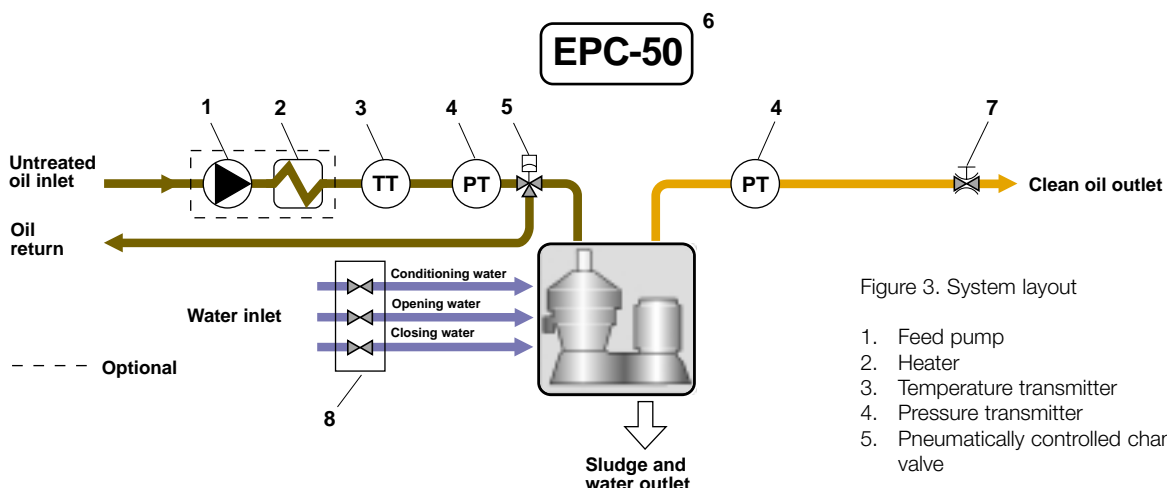


Figure 3. System layout

1. Feed pump
2. Heater
3. Temperature transmitter
4. Pressure transmitter
5. Pneumatically controlled change-over valve
6. Control unit
7. Regulating valve
8. Solenoid valve block, water

Features & Benefits

- *Small footprint* and compactness gives flexibility in positioning in the engine room and saves space.
- *Installation ease* as all components and hardware are pre-installed. This saves significant costs, installation manhours, design and materials compared with loose components.
- *Sludge Removal Kit* avoids the use of a separator sludge tank saving considerable material and installation costs (optional).
- *No water tank* needed to supply operating water, saving materials and installation costs.
- *Pre-tested* system means that all functions are tested and approved at the factory, giving quicker commissioning.
- *Simple installation, operation and maintenance* because there are few and standard components.
- *Virtually no oil losses* because of efficient displacement.
- *Effective discharge* of separated sludge and water.
- *Built-in PI temperature controller* in EPC-50 control unit.
- *Remote supervision* is available in several options. REMIND software is included with every delivery. Network solutions using REMIND and SATTBUS communication or PROFIBUS and own software allow remote supervision from a control room.

Installation

The Purifier Unit is designed for automatic operation in periodically unmanned engine rooms.

Each unit is equipped with its own EPC-50 and ancillary equipment, forming an independent system.

The Purifier Units may be operated in single, parallel or in series.

For cleaning of distillate, marine diesel oil, and lubricating oil, the Purifier Unit should be operated in single or parallel configuration, depending on cleaning requirements. The separators should always be operated as purifiers.

If more than one Purifier Unit is installed in a plant for the cleaning of intermediate or heavy fuel oil, the systems could be operated in series. In such a case, the first separator should be operated as a purifier, followed by the second separator operated as a clarifier.

Up to nine Purifier Units in the same cleaning plant can be interconnected via cables between their EPC-50 control units.

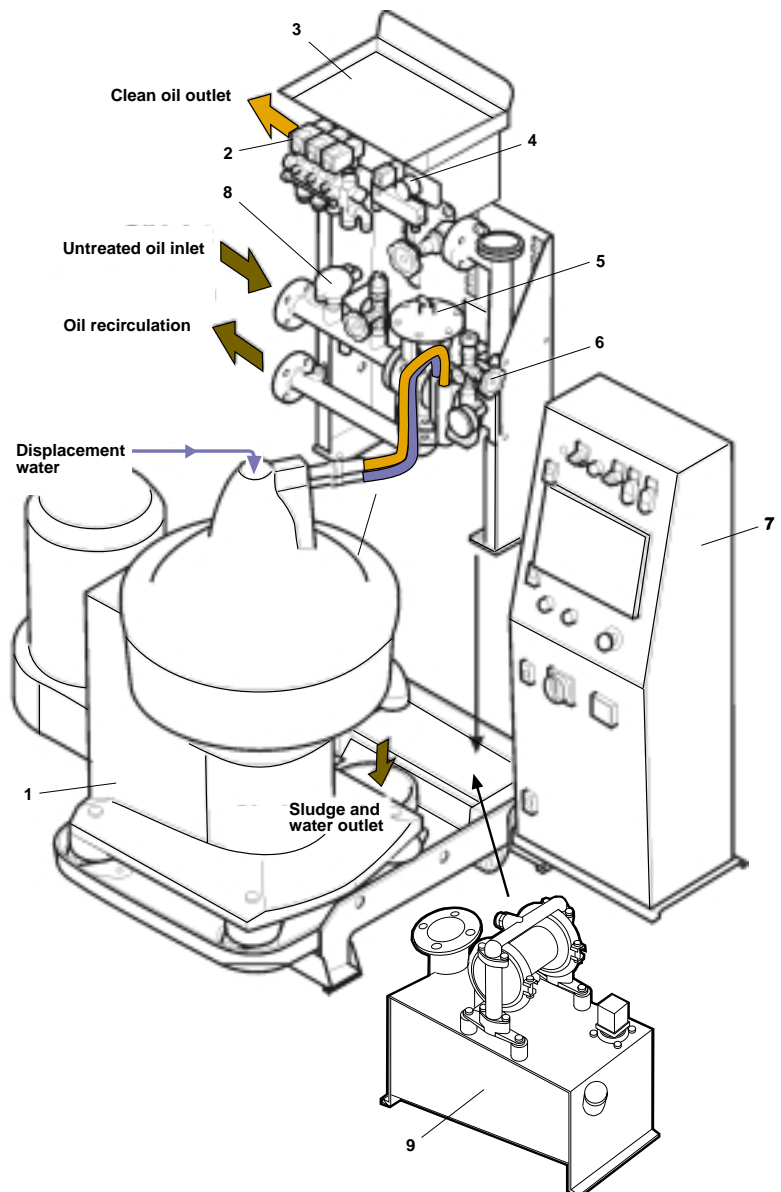


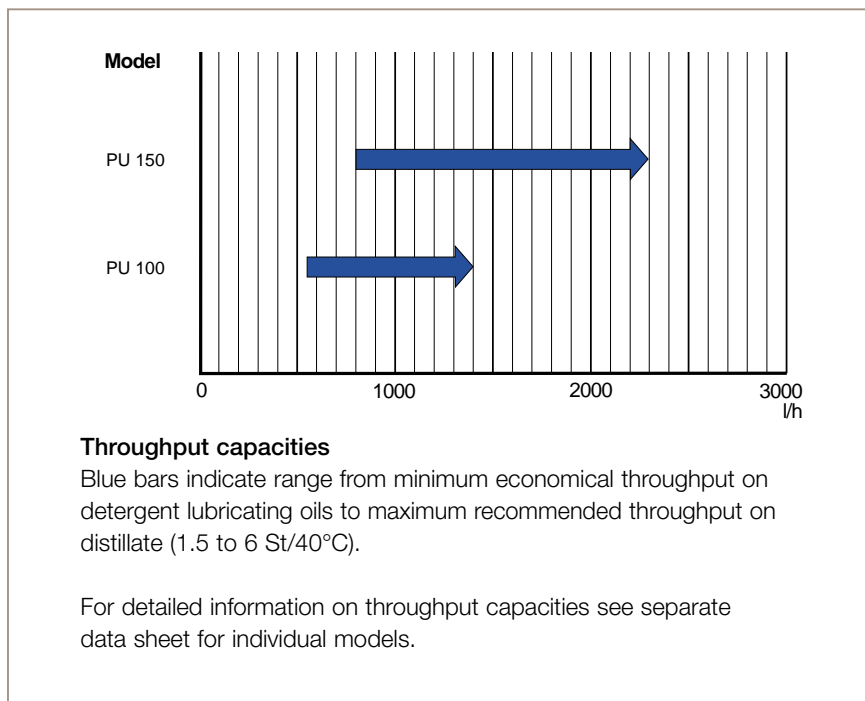
Figure 4. Schematic system layout diagram

1. Separator
2. Operating water solenoid block
3. Service shelf
4. Operating air solenoid block
5. Change-over valve
6. Pressure transmitter (oil outlet)
7. Control cabinet
8. Temperature transmitter
9. Sludge Removal Kit (optional)

Operations

A preventive maintenance program has been developed using service kits.

- Maintenance intervals
 - Intermediate Service every 2000 h or 3 months
 - Major Service every 8000 h or 12 months
- Service spares kits contain all necessary spare parts for each service and tips for maintenance in Checkpoints
 - 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
- System Manual includes detailed information in electronic format or paper copy
 - Operating Instructions
 - Alarms & Fault Finding
 - Installation Instructions
 - Service & Spare Parts
- Commissioning & technical service is available from all Alfa Laval offices to start-up the system and to advise about operation & maintenance
- Training in all aspects of oil treatment, fresh water generation and heat transfer is obtainable
- All services are incorporated in specially tailored Alcare Customer Care packages, with details available from local Alfa Laval offices.



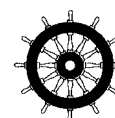
Technical data

Purifier Unit	Size	Volume	Weight
PU 100	1190x1050x1245 mm	1.6 m ³	480 kg
PU 150	1190x1050x1245 mm	1.6 m ³	485 kg

Main supply voltage	3-phase, 400/440/480 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 7 bar
Operating water pressure	Min 2 bar, max 6 bar

Conformity

CE The mark of conformity confirms that the equipment complies with European Economic Area (EEA directives). The Separation Unit also complies with the Marine Equipment directive.



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How to contact Alfa Laval

Contact details for all countries are continually updated on our website. Please visit www.alfalaval.com to access the information direct.