PA Purifier System

System Description

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Published By:
Alfa Laval Tumba AB
SE-147 80 Tumba, Sweden

Telephone: +46 8 530 650 00
Telefax: +46 8 530 310 40

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1 System Overview

The PA Purifier System is designed for cleaning of lubricating and fuel oils in marine and power applications and can handle the following types of oil:

- distillate
- marine diesel oil
- intermediate fuel oil
- heavy fuel oil with a maximum viscosity of 600 cSt
- detergent lubricating oil
- R&O lubricating oil

In the purifier process, heated oil is fed through the separator to clean the oil from solid particles and water.

The system comprises:

- A separator.
- Ancillary equipment including a control unit.
- Optional equipment such as oil feed pump, oil heating system, sludge removal kit, etc.

The separating systems can be operated as single, parallel or serial systems.

During the process, the cleaned oil leaves the separator through the oil outlet, separated water leaves through the water outlet, and sludge accumulates at the periphery of the separator bowl.

The control unit initiates a sludge discharge at preset intervals.

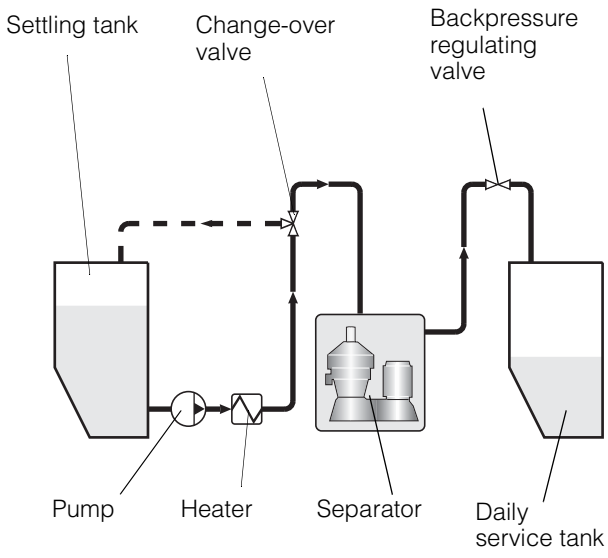
Sludge and water are then discharged through sludge ports at the periphery of the bowl and collected in a sludge tank.

1.1 The Oil Flow

The unprocessed oil is fed by a positive displacement pump, operating at a constant flow. Depending on the oil type, the oil may need to be heated.

After the heater the change over valve directs the oil to the separator. The separated oil passes the manually operated back-pressure regulating valve to the receiving tank.

The oil can also be directed back to the tank, bypassing the separator. This is the case when the oil temperature is outside the preset range, during separator start and stop procedures, and during alarm conditions.



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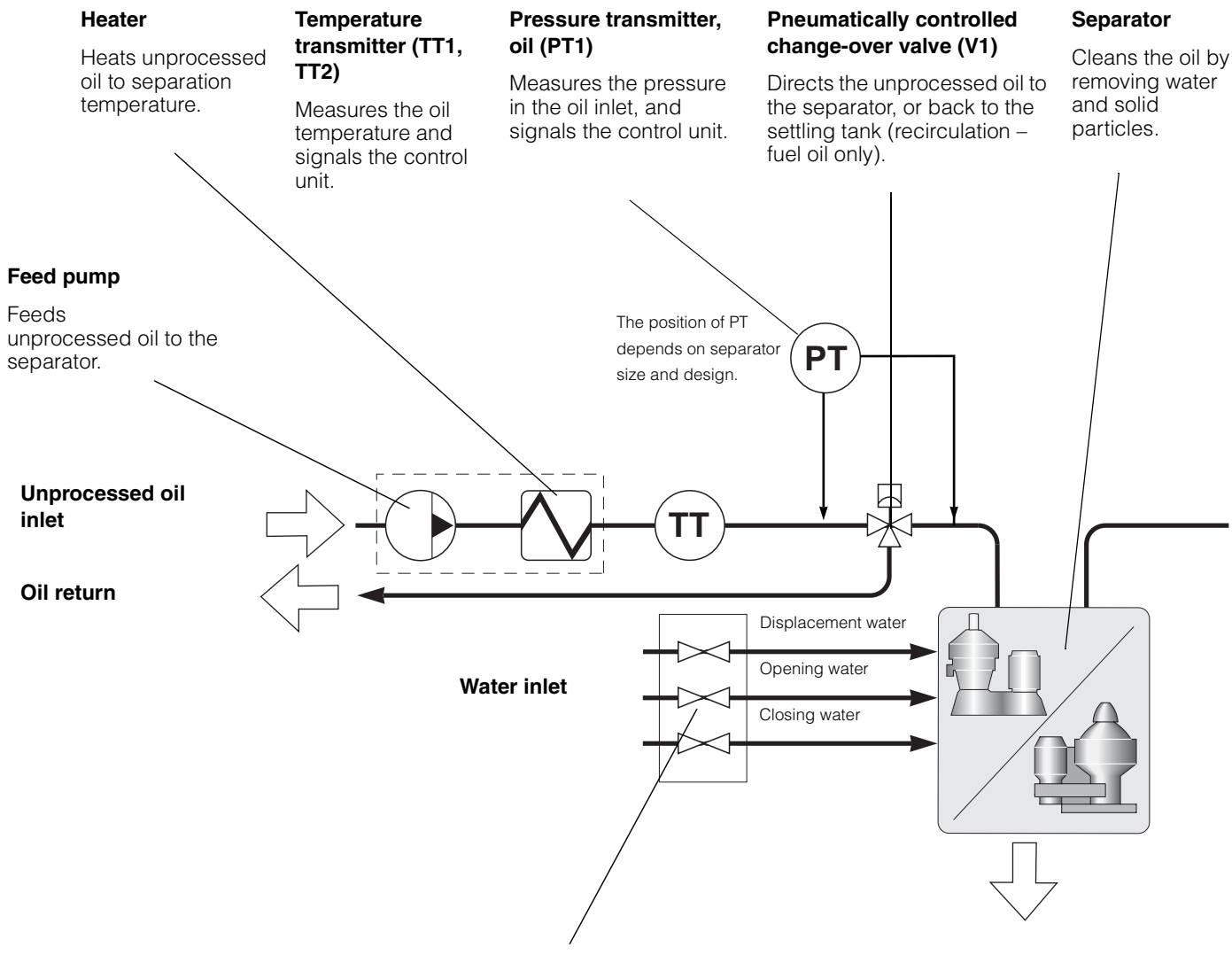
1.2 System Layout



Control unit

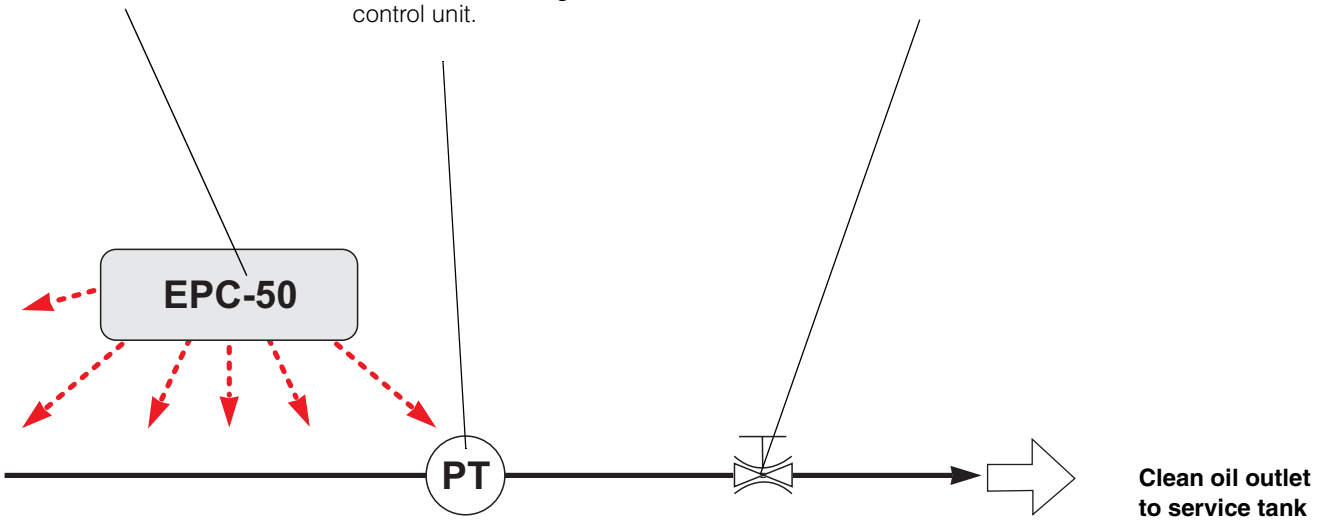
Supervises the separation system.

Pressure transmitter, oil (PT4)

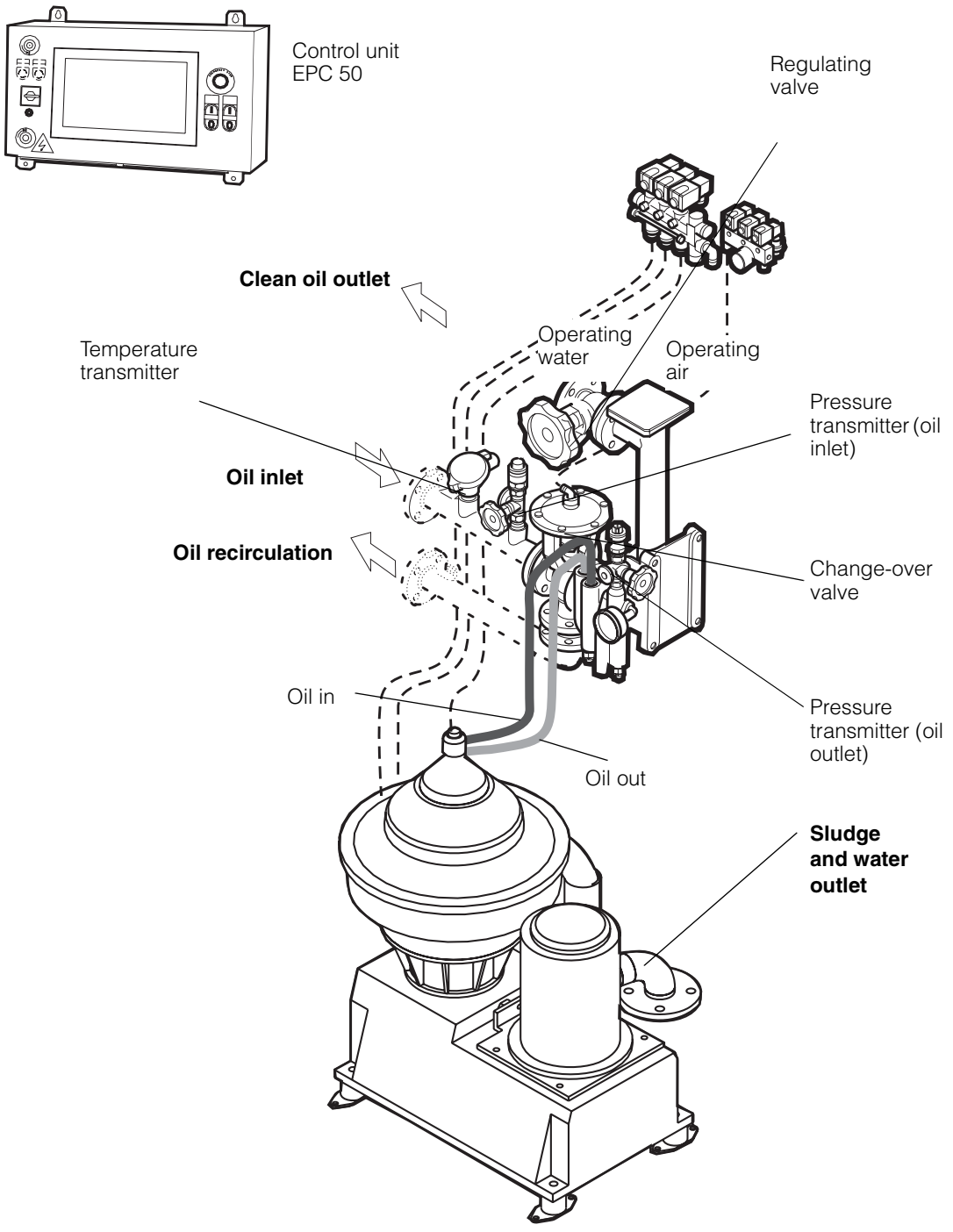
Measures the pressure in the oil outlet, and signals the control unit.

Regulating valve (RV4)

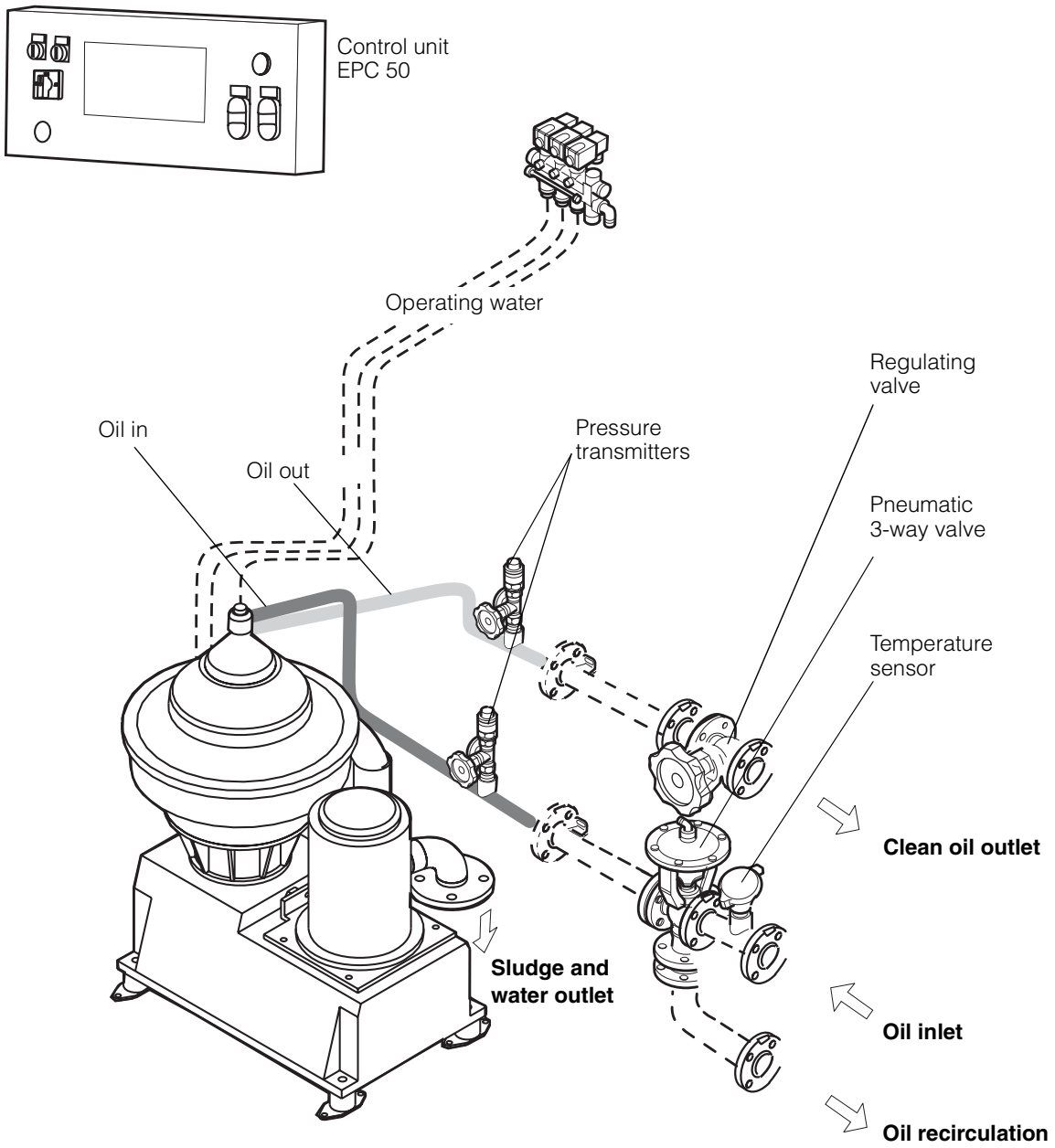
Regulates the back-pressure in the clean oil outlet.



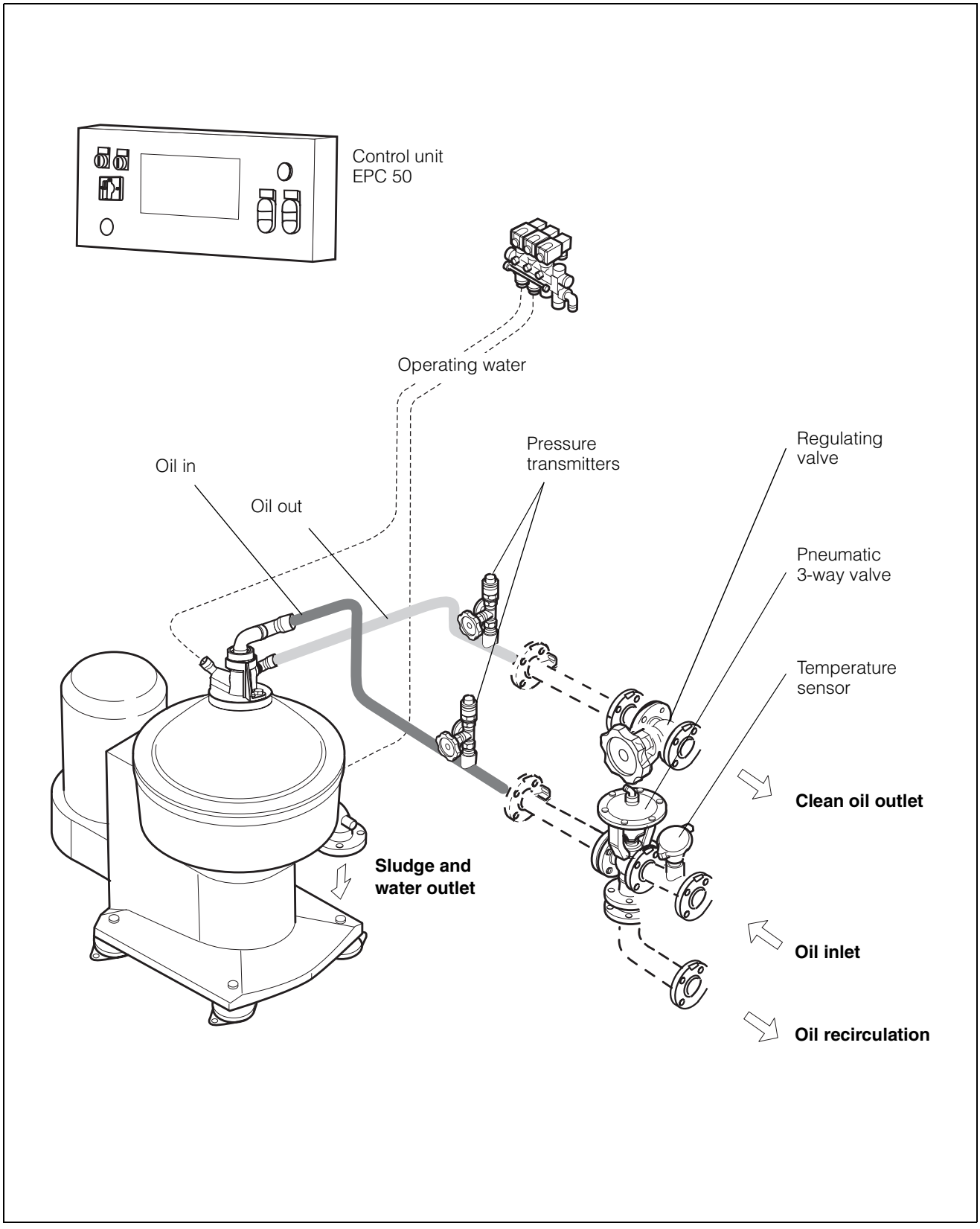
1.3 System Components, PA 600/610



1.4 System Components, PA 605/615



1.5 System Components, PA 625/635



2 The Process

The terms used in this process description are explained in section “2.2 Definition of Terms” on page 12.

2.1 Purifying

A water seal is added to the separator bowl through the water inlet.

The separator is equipped with a gravity disc, chosen according to factors such as oil temperature, density, and feed rate. This choice decides the position of the interface between oil and water seal.

The separator does not use a paring disc to pump out the separated water. Instead, the water leaves the bowl via the gravity disc, and leaves the separator through the water/sludge outlet.

Process Cycle

1. A specific amount of water is added to the separator bowl to form a water seal.
2. The feeding of unprocessed oil to the centre of the separator bowl starts.
3. During the separation process sludge and water accumulate at the periphery of the separator bowl. Cleaned oil is fed from the separator by the integrated paring disc. Excessive water leaves the bowl through the water/sludge outlet to the sludge tank.
4. After the preset time between discharge sequences, the oil feeding stops.
5. Displacement water is added to the bowl. The displacement water reduces the oil loss at the following sludge discharge.
6. A sludge discharge is initiated while the displacement water is still flowing.

The next process cycle starts with adding of water for a new water seal.

2.2 Definition of Terms

Preset time between sludge discharge sequences (Parameter value)	When this time has elapsed after a sludge discharge, the next discharge is initiated.
Water seal (Parameter value)	Water, added to the separator bowl to prevent oil from escaping at the water outlet.
Displacement water	Water, added to the separator bowl to displace the oil and ensure there is reduced loss of oil at sludge discharge.
Purifier	A separator that cleans the oil from water and sludge with continuous evacuating of separated water.