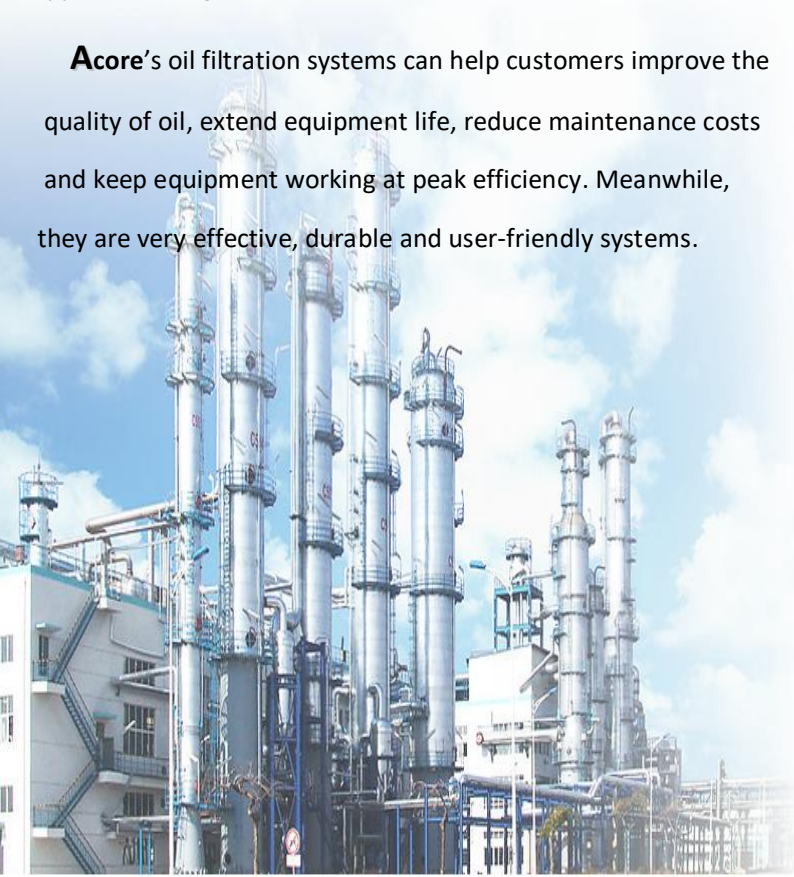




### TOP Turbine Oil Purifier

**Acore Filtration Co. Ltd** provides engineering, manufacturing, sales of industrial oil filtration systems, we have been striving for studying the user's requirement and provide filtration solutions for every demanding application on global scale.

**Acore's** oil filtration systems can help customers improve the quality of oil, extend equipment life, reduce maintenance costs and keep equipment working at peak efficiency. Meanwhile, they are very effective, durable and user-friendly systems.



### Introduction:

It is well recognized that harmful effect of particles and moisture contamination in turbine lube oils, and the contaminated oil is responsible for major maintenance and operational problems of critical components in turbine systems. Water contamination typically is a result of condensation and leaks into system, which increases corrosion in the system, oil oxidation and acid build-up. Particle contamination is a result of mechanical wear, dust, maintenance operations etc, which increase wear out of critical components and mechanical failures. So it is extremely important to improve the reliability of turbine systems, prolong life of critical components and fluid service life by removing all solid and water contamination, reducing corrosion, oil oxidation and formation of acids, maintaining absolute cleanliness of turbine lube oils.

Acore Turbine Oil Purifier(TOP) utilizes vacuum dehydration combining with coalescing & micro-glass filters media technology into one system for efficient and cost-effective oil purification and maintaining absolute cleanliness of turbine lube oil. Coalescing filters remove mass free water, vacuum dehydration removes moisture dissolved and micro-glass filters remove mechanical particles. TOP Turbine Oil Purifier is ideal for extending turbine oil life and has the features of low maintenance and operation cost.



*Before*

*After*



### Features:

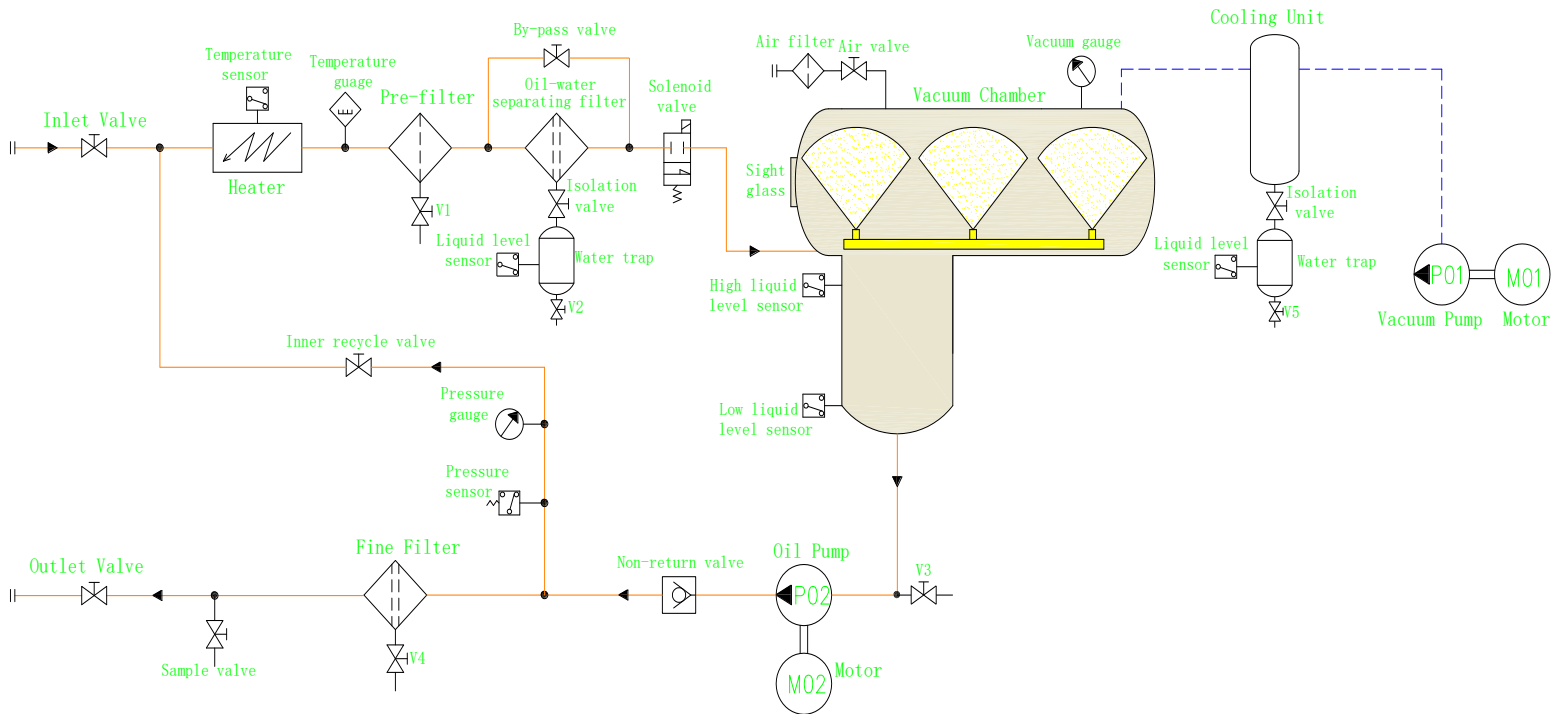
- Bring 5000 ppm of free, emulsified and dissolved water down to 100 PPM or less by vacuum dehydration and coalescing filter media.
- High efficiency three stage micro filter elements with capable of removing 99.5% particles as small as 1 micron.
- Achieving soluble air and gas content of  $\leq 0.1\%$
- Different pressure gauge of filters monitor the condition of filter vessel and indicate replacement of filter elements.
- By electric heater with digital temperature controller, the oil is directly heated to a suitable temperature range of 20-100 °C

- Installed directly on any turbine oil reservoir as a by-pass oil cleaning unit or it can be used as a mobile machine
- Interlocking protection system connecting with pumps, heater and liquid level sensor to avoiding heating and pumping without oil, oil leak and electricity leak. If there is any fault, machine will be power off automatically.
- Self-contained, skid mounted, stationary system or as a portable system
- Ideal purification system for lube oil in combustion turbine, steam turbine, hydro turbine etc.

## Technical Specification

Model	TOP-10	TOP-20	TOP-30	TOP-50	TOP-100	TOP-150	TOP-200	TOP-300	
Capacity(L/min)	10	20	30	50	100	150	200	300	
Working vacuum	-0.06~-0.095 Mpa								
Working pressure	≤ 0.4 Mpa								
Temperature range	0-100°C								
Water content	≤100 ppm								
Gas content	≤ 0.1%								
Demulsifying value	≤15min(GB/F7035)								
Cleanness	NAS 4-6 grade								
Filtering precision	≤1 micron								
Continuous work	100 hr								
No failure running	≥5000 hr								
Power supply	380V, 50HZ, 3PH ( or Customized )								
Working noise	65 dB								
Heating power (kw)	24	24	30	40	60	90	145	160	
Total power (kw)	27	27	33.5	44	65	97	157	178	
Inlet/outlet(mm)	25	25	32	32	48	50	58	65	
Weight (kg)	300	350	400	500	800	1000	1200	1350	
Dimension (mm)	L	1200	1250	1400	1500	1650	1750	1900	2000
	W	600	710	850	950	1100	1200	1250	1350
	H	1280	1300	1300	1400	1800	1850	1950	2100

## Flow Chart



## Specifications of Components

### Electric Controlling System

All electrical control gear, mains Isolating arrangement, starters, contactors, indicating lamp, push buttons, fuses, relays, Interlocking protecting device etc. are housed in a compact control panel sheets. A mimic diagram is provided on the control panel.

The main components of the electrical apparatus can ensure the safety of the controlling system. The interlocked protective system and pressure protective device which will avoid overload, over voltage, pumping without oil, heating without oil, oil leak, electricity leak and prevent any damages to equipment due to operating error or power failure.

### Heater

The unit equips a digital temperature controller as a safety thermostat, which has a reliable thermocouple sensor mounted in a pocket inside the vessel. The temperature can be set by manually and with capable of heating oil from 20°C to 80°C. the designed temperature range can protect the safety both device and worker. The deterioration of the oil caused by overheating is avoided.

The heating components can warm up temperature around and heat radiation, container can uniformly warm up the oil, adopting low load of heated surface, less than 1.5W/cm<sup>2</sup>.

The heater has safety protection device with sensor, which can avoid heating without oil. It is secure and reliable.

Construction of the heat exchanger shall be such that the replacement of heaters is easy and shall not require any special tools. A drain valve for the heater tank is provided.

### Inlet & Outlet Pump (Inlet pump are optional)

**Inlet pump(Optional):** Positive displacement gear type driven by electric motor; flow control valve & pressure safety valve against over-pressure is provided. Interlocking arrangement is provided between the inlet pump and the heater I, so that the heater cannot be energized unless inlet pump is ON. Interlocking arrangement between the inlet pump and high level float switch avoid excessive rise of oil in the vacuum chambers.

**Discharge Pump:** suitable for sucking oil from the vacuum chambers held under vacuum. This is fully tested for pressure and vacuum leak rate. The pump is of robust construction and capable of developing pressures of up to 200 PSI. Interlocking arrangement is provided between low level float switch and discharge pump to prevent dry running of discharge pump.

## Vacuum Pump

A water-ring vacuum pump is a sort of vacuum production equipment suitable for pumping air and make the oil purifier working under high vacuum status.

A cooler between vacuum pump and vacuum chamber reduces the temperature of vapor and avoids the vacuum pump damaged.

## Vacuum Dehydration & Degasification Chambers

Vacuum dehydration & degasification chambers is composed of horizontal & vertical vacuum dehydration & degassing chambers. Under the high vacuum status, vacuum evaporation vessel enlarge evaporation area efficiently, leading to the formation of film-like oil and stereo-evaporation. The spray jets is provided at each of the vacuum vessel and becomes an evaporator. This a unique design improves the contact surface area of oil exposed in vacuum system and extends sufficient time to ensure maximum operating efficiency in the removal of gas and moisture. The gas can be quickly sucked out by vacuum pump. Sight glass viewer for observation of oil flow in vacuum chamber is provided.

## Filtration System

**Pre-filter:** the filter element is made of stainless steel, its function uses to prevent any damage to the inlet pump. It has strainers capable of retaining all particles above 100 micron. It is possible to clean the strainer without dismantling the filter.

**Oil-water separating filter(Optional):** This filter element is made of specialized glass fiber, which can remove free and emulsified water from oil.

**Fine filter:** This filter element allows to accept a standard filter separating particles as small as 1 micron.

Pressure gauge and pressure protector is provided on the filter vessel in order to ascertain condition of cartridge elements and avoid the overpressure.

## Liquid-level Controller

The automatic electric float ball switch is provided in the vacuum chambers to protect the vacuum chamber from overflowing and too low oil. It connects with inlet/outlet pump, electromagnetic valve to control balance of inlet and outlet oil quantity, it prevents the insulating oil to penetrate into the vacuum pump, prevent the oil level in the chamber to get too high and too low, avoiding to outlet pump running without oil.

An oil foam sensor connected with solenoid valve is provided in vacuum chamber to prevent oil getting into the vacuum pumps if the spray chamber overflows and avoid to damage vacuum pump.

## Cooling Unit

An air cooled condenser condenses the vapors to water where it is collected in a water trap. The condensate tank includes a liquid level sensor that shuts the system down and lights a light on the control panel; automatic water drain is also available.

## Gauges

Compound pressure gauge, vacuum gauge, digital temperature gauge are provided.

Optional: Flow meter, moisture meter

## Pipe Work:

All pipe work, the vacuum chamber and the filter housings are made from high quality carbon steel. The piping joints are flanged type with O'ring sealing.

## Valves

Different ball valves: inlet/out valves, drain valves of all tanks, electromagnetic /solenoid valves, sample valve are provided.

## Oil Hoses

Two Nos. transparent steel spring type hoses each 10 meters long with flanged end connection on both sides are provided.

Oil Hoses capable of handling the transformer oil at 100°C (max.) and vacuum.