



## VLF Lube 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** 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.



### Introduce

It is well recognized that harmful effect of particles and moisture contamination in hydraulic and lube oils, and the contaminated oil is responsible for major maintenance and operational problems of critical components in lubrication and hydraulic 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 hydraulic and lubrication 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 hydraulic and lube oils.



VLF Lube Oil Purifier from Acore Filtration Co.,Ltd is developed to improve liquid quality by continuous removal of particles, sludge free water, emulsified and dissolved moisture from hydraulic and lube oils. It can remove 100% of free and emulsified water, 90% of dissolved water and bring water content down to 80 ppm by coalescence technology and vacuum dehydration, and remove 1 micron particulate by high precision fiber filter elements. VLF Lubricating Oil Purifier is ideal system for maintaining original property, ensuring optimal performance and extending service life of hydraulic and lube oils. It also help end-user reduce overall operational and maintenance cost of modern industrial lubrication systems.

### Features

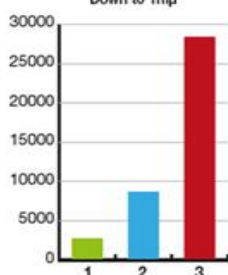
1. High-performance water, gas, and particulate removal
2. Minimizing fluid oxidation, maintaining lubricity properties and reducing aeration and acid build-up.
3. Low watt density oil heaters and digital temperature controller
4. High-quality filter elements with high dirt holding capacity, and filter elements can be cleaned or replaced.
5. Extension of fluid life, improved productivity, reduced time for fluid changes, minimized corrosion within fluid systems, Increased equipment reliability.
6. Low maintenance requirements, minimal installation requirements and automatic operation

Before After

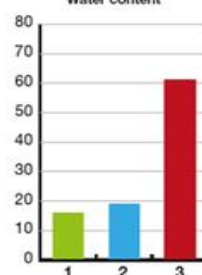


- 1 Purified oil from old oil Nas 3-4
- 2 New oil (200-l drum) Nas 4-6
- 3 Old oil (17,500 hours) Nas 7->

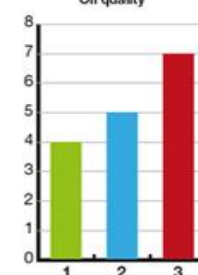
Particle counting  
Down to 1µm



PPM  
Water content



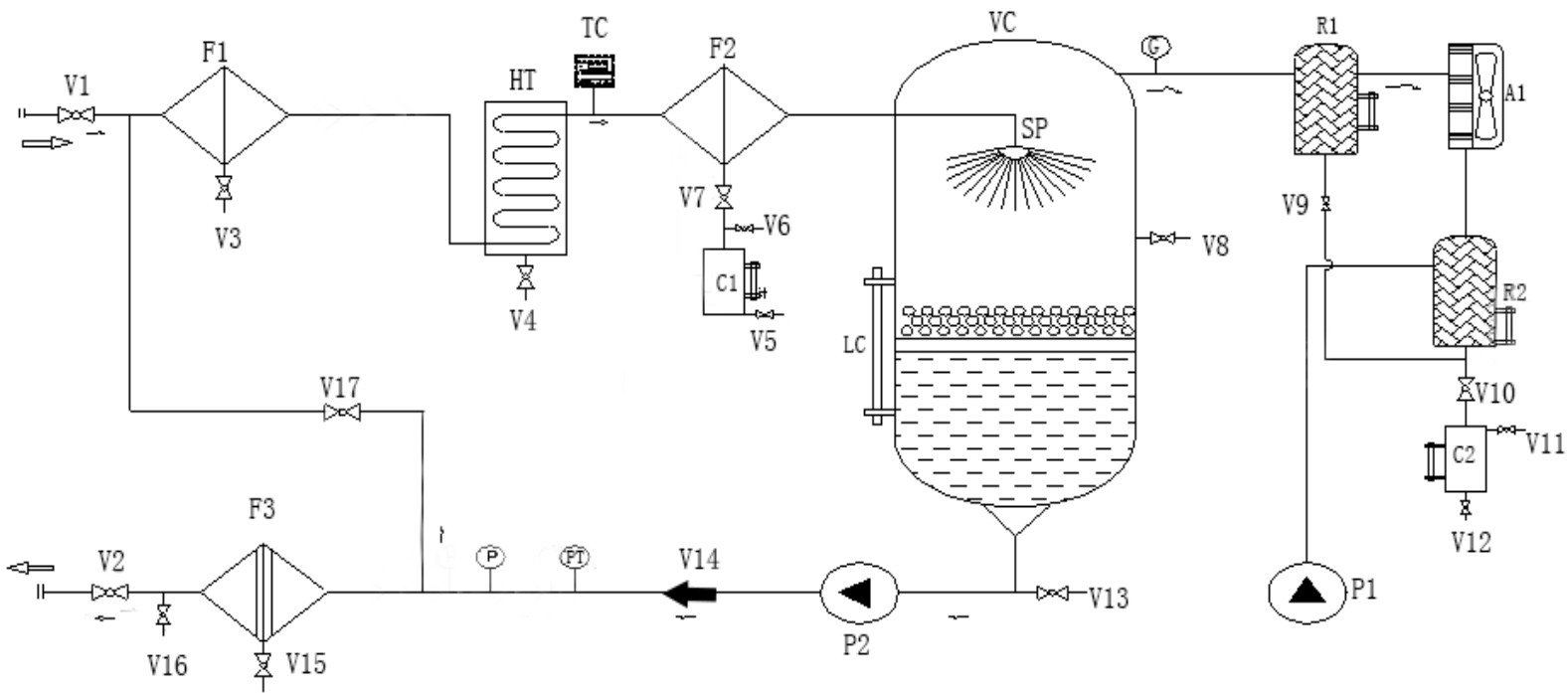
NAS  
Oil quality



### Technical specification

Model	VLF-10	VLF-20	VLF-30	VLF-50	VLF-100	VLF-150	VLF-200	VLF-250	VLF-300	
Capacity(L/min)	10	20	30	50	100	150	200	250	300	
Working vacuum	-0.06~-0.095 Mpa									
Working pressure	≤ 0.4 Mpa									
Temperature range	20-80°C									
Water content	≤80 ppm									
Gas content	≤ 0.1%									
Demulsifying value	≤8 min(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	35	60	90	120	140	150	
Total power (kw)	27	27	33	40	65	100	130	150	165	
Inlet/outlet(mm)	25	25	32	32	48	50	58	62	65	
Weight (kg)	300	350	400	500	800	1000	1200	1300	1350	
Dimension (mm)	L	1100	1150	1200	1300	1500	1600	1700	1900	2000
	W	800	800	850	950	1000	1150	1250	1300	1350
	H	1200	1250	1300	1350	1500	1600	1800	1900	2000





**Flow Diagram For VLF Lube Oil Purifier**

V1: Inlet valve  
 V2: Outlet valve  
 V3, V4, V5, V12, V13, V15: Discharge valve  
 V7, V9, V10: Switch valve  
 V6, V11: Air valve  
 V8: Vent valve  
 V14: No-return valve  
 V16: Sample  
 V17: Internal recycling valve

F1: Coarse filter  
 F2: Water separator  
 F3: Fine filter  
 HT: Heater  
 TC: Digital temperature controller & gauge  
 C1 & C2: Water collector  
 VC: Vacuum chamber  
 SP: Oil sprayer  
 LC: Oil level controller

R1 & R2: Cooler  
 A1: Blower  
 P1: Vacuum pump  
 P2: Oil pump  
 PG: Pressure gauge  
 PT: Pressure protector

### Working Principle

The lube oil is drawn into the system by the use of the vacuum pressure created by the vacuum pump and passed through an inlet coalesce filter, before entering into the vacuum chamber, where water and gases contained in the oil are thoroughly exposed to vacuum by efficient dispersion and removed through a vacuum pumping; the oil is heated by the electrical heater to the operator pre-set processing oil temperature. The sprayer inside the vacuum chamber maximizes the exposure of oil to the effect of vacuum, which make moisture and gas dissolved in oil evaporated and discharged through vacuum pump. After dehydration and degasification, the purified oil is discharged by a pump through second filter and fine filter, where a fine polishing of oil takes place. After passing through the fine filter, the oil flows through the outlet or re-circulation valve.



## Specifications of Components

### Electric Controller

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.

### Heating System

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.

Heating elements is made in refractory formers and don't directly contact with oil so that localized overheating, hot spot and breaking of oil 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(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 rotary vane 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 by high temperature of vapor.

### 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-alike oil and stereo-evaporation. The prayer jets are provided at each of the vacuum vessel and become an evaporator. This 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 or Illuminating lamp for observation of oil flow is provided.

### Filtration Device

The filtration system is composed of different precision cartridge filter elements, it features unique design, large filtering area, strong particles-absorbing ability, impurities with different particulate sizes are filtered step by step. The filtration system has stable and perfect filtering precision. The filter elements are easy to clean or replaced.

**First coarse 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 80 micron. It is possible to clean the strainer without dismantling the filter.

**Second filter:** This filter element is made of specialized glass fiber, which has large impurities holding capacity and can retaining all particles above 10 micron.(Note: second filter can use coalescer filter elements as requirement)

**Third 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 protects the vacuum chamber from overfilling 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.

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

### Condenser

An air cooling condenser condenses the vapors to water where it is collected in a stainless steel condensate tank. The condensate tank includes a high level switch 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, digital vacuum gauge

### Pipe Work:

All pipe work, the vacuum chamber and the filter housings are made from high quality carbon steel.

(Option: Stainless 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.