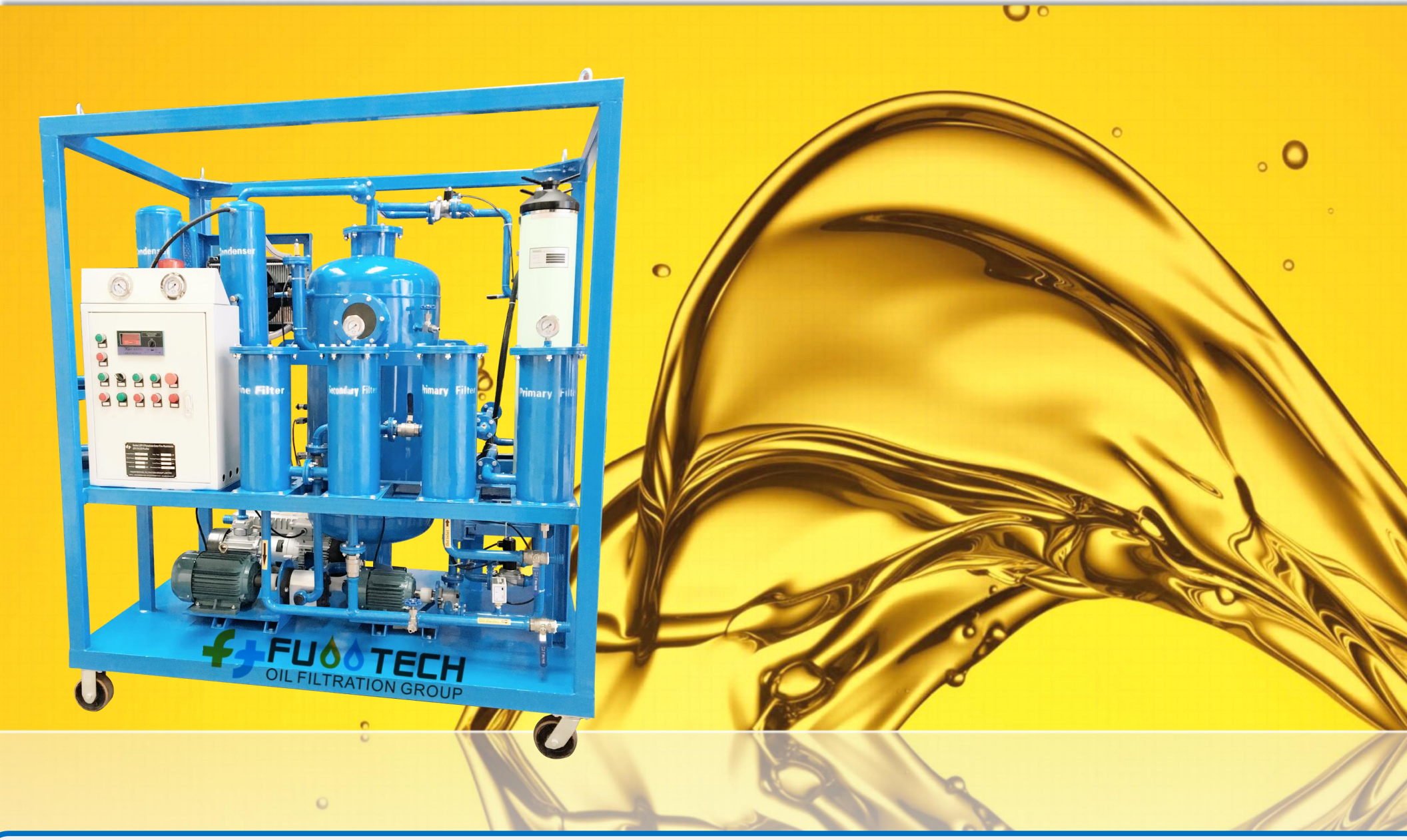
FUOO TECH
OIL FILTRATION GROUP



SERIES LOP-I OIL PURIFIER

FOR PHOSPHATE ESTER FIRE-RESISTANT FLUIDS

Introduction on LOP-I Series Oil Purifier

FUOOTECH® is the experienced manufactuer and supplier of **Phosphate Ester Fire-resistant Fluid (FRF) Oil Purifier**. **Series LOP-I Phosphate Ester Fire resistant hydraulic oil purifier** is designed for purifying the unqualified phosphate and degenerative ester fire-resistant fluid (FRF) oil and widely used in the big & medium-size thermo electrical power generation plants (specially at EH Oil System), Hydraulic Power System and chemical plants.

Series LOP-I EH oil purification machine can treat and regenerate the degenerative fire-resistant oil, removing acid, pigment, gas, water and particles from oil effectively. This machine's body is made of acid and dissolving resistant special full stainless steel materials, which are compatible with fire-resistant oil, combined with technologies of vacuum dewatering, multi-stage filtration system and new adsorbent to ensure treated oil to achieve new fire-resistant oil properties.

Series LOP-I is the necessary purifying equipment for the sectors which use fire-resistant oil, it can be online working and oil-filling.

What is the Fire-Resistant Fluid (FRF)?

Phosphate esters are the most fire resistant of the non-aqueous synthetic basestocks in common use. Their high ignition temperatures, excellent oxidation stability and very low vapor pressures make them difficult to burn, while their low heats of combustion result in self-extinguishing fluids.

Since the discovery of their excellent anti-wear and fire resistance properties in the 1940s, the use of phosphate esters by industry has steadily increased. Fire Resistant Hydraulic Fluid is fully synthetic Phosphate Ester based Fire resistant Hydraulic Fluid.

It has excellent thermal & oxidation stability. Phosphate Ester Fire Resistant Hydraulic Fluid (FRF) gives excellent lubricity under working condition. Phosphate Ester Fire Resistant Hydraulic Fluid (FRF) has excellent resistance to oxidation at normal working temperature, so it retains Viscosity throughout during its service life and gives a very good corrosion protection for longer period. It also avoids the excess water in system to easily separate out from it. It has a good anti foaming property.

Applications of FRF

When the possibility exists that a hydraulic fluid may come in contact with a source of ignition or the surface of very hot equipment, fire-resistant fluids may be used. This potential fire risk exists in applications such as die-casting operations, and continuous casting hydraulics in steel mills or presses that are operated near presses or ovens.

Electro Hydraulic Controls (EHC) used for governing steam supply to turbine generators are also applications in which high pressures and temperatures dictate the use of fire-resistant fluids to mitigate the potential for dangerous and expensive fires.

Phosphate esters are the most common fluid used in EHC in power turbine control systems.

Other applications includes:

- Industrial hydraulic fluids system
- Aviation hydraulic fluids system
- Electrohydraulic Control (EHC) fluids System for steam turbines
- Power Generation Need for Fire Resistance (Reported that 75% of fires originate in turbine oil systems, Further reported that 50% of these fires originate from the hydraulic system, It is estimated that the use of fire-resistant hydraulic fluids save hundreds of lives per year in the world.)
- Aluminum casting and extruding industries

- Tilting systems of cast Iron melting furnace
- Steel industry
- Foundries and Forging industries
- Electrical Arc Furnaces
- Coal Mining operations
- Underground construction
- Incineration factories

Why Need to Purify Fire-Resistant Fluid (FRF)?

The oil used in electrohydraulic control (EHC) systems and other hydraulic systems can become contaminated with water and particles over time, with the oil in particular degrading to form an acidic by-product. Water and phosphate ester together form strong acid which leads to premature fluid replacement.

High acid number (AN) in phosphate ester means premature fluid replacement if left unmanaged. Since acid production is autocatalytic, the acid in your system will generate more acid until your fluid becomes unusable.

Dissolved metal ions in phosphate ester form gels and deposits that accumulate on servo valve nozzles & flappers, resulting in slow servo valve response time, unit trips, and reduced fluid resistivity.

Low resistivity in phosphate ester leads to electro-kinetic corrosion between dissimilar metal surfaces and is one of the condemning factors of phosphate ester.

Thanks to absorbing the advanced technology of similar products at home and abroad, our **LOP-I Series Oil Purifier Machine can offer a complete solution for trouble-free EHC operation using phosphate ester fluids. Avoid premature fluid replacement, bleed and feed, and eliminate expensive flushes. LOP-I Series Oil Purifier Machine is the new standard for maintenance of water, acid, resistivity, and removal of particles that cause servo valve failure.** **It is ideal for steam turbine EHC fire resistant fluid maintenance.**

Features

- This machine's body is made of acid and dissolving resistant special full stainless steel materials, which are compatible with fire-resistant oil, combined with technologies of vacuum dewatering, multi-stage filtration system and new adsorbent to ensure treated oil to achieve new fire-resistant oil properties.

- Stainless steel machine body, pipes and filtering components, reliable, anti-corrosion, durable.
- Duplex 3D Stereo-evaporation technology, equipped with unique and advanced dewatering, degassing components, can rapidly and effectively remove water, gas, particles and volatile matter
- Special filters for removing acidity and increasing resistivity.

- Advanced medium cooling system
- High quality filtering components, large capacity for holding particles, anti-corrosion, good mechanical performance, long lifetime.
- Efficient electric heating system, heating uniformity, less power consumption, safe, and reliable.

- Adopt interlocked protective system, which connect oil pump, heater and liquid level sensor, avoiding blank heating, blank pumping, oil leak and electricity leak. If there is any fault, machine will be power off automatically.
- The purifier is a next-generation vacuum oil filter machine destined for phosphate ester fire-resistant oil system, utilizing dewatering and degassing technologies such as anti-precipitation, aggregation, separation transformation, resolution, vacuum entrapment and flash evaporation, which not only speedily removes the free water in oil but also intensively removes the dissolved water and gas in oil.

- The stage-to-stage dandified filter element made of new composite materials can remove the large amount of impurities in oil and results in a precision filtration.
- Application of new absorptive filter materials can effectively absorb the jelly substance in oil, and eliminate the acid content in oil, as well as inhibiting the production of new acid in the system.

- Can be controlled by PLC fully automatically as option.
- Online operation at low temperature, 100% physical process will not cause any second pollution, environment friendly.
- The materials and phosphate ester are of good adaptability, no leakage, and non corrosive.

Working Principle

When LOP-I machine starts working, the used oil will be sucked into primary filter under the vacuum pressure, the big size particles are removed, then oil enter into the heater to heat upto set temperature, the heated oil flows into Vacuum separator chamber, it's a special radiation evaporation device inside the chamber, which make

the unit/volume oil to produce a large surface evaporation area, lets the polluted oil exposure in the low humidity atmosphere, thus the water/moisture, air and gas can be evaporated/vaporized and eliminated. The treated vapor and gas form the gaseous mixture becomes the liquid through the condensation, then the liquid enters water receiver together, the vacuum pump extracts the surplus gas.

After that, oil is pumped into secondary filter and fine filter where can remove more tiny particles. Then clean oil goes out from oil outlet hose.

When all the procedures are completed and water content & gas content are separated and removed, you can choose to switch on the acid removal button and increasing resistivity button to proceed the jobs of removing acid value and increasing resistivity.

Oil Performance After Purification

Moisture (Water Content)	≤ 100 PPM
Gas/air Content	≤ 0.1%
Filtering Accuracy	≤ 3 micron
Resistivity value	≤ 6×10^{9} Ω.cm
Acid Value	≤ 0.05 mg KOH/g
Cleanliness	≤ NAS 1638 Grade 6

Technical Parameter

Parameter		Unit	LOP-I-10	LOP-I-20	LOP-I-30	LOP-I-50	LOP-I-70	LOP-I-100
Flow rate		L/h	600	1200	1800	3000	4200	6000
Working vacuum		MPa	-0.07~-0.095					
Working pressure		MPa	≤0.4					
Power supply			380V 50HZ 3Phse (or as per user's option)					
Working noise		dB(A)	≤ 50 ~ 80					
Operation Temperature		℃	40 ~ 75					
Heating power		KW	12	18	24	30	36	60
Total power		KW	17	20	30	40	48	72
Diameter of inlet and outlet		DN	25	25	32	40	40	40
Dimension	L	mm	1100	1300	1450	1700	1800	1930
	W	mm	800	950	1000	1150	1200	1330
	H	mm	1350	1480	1580	1900	1930	1980
Weight		KGS	360	430	550	700	900	960

Note: 1. The dimension and weight will be changed with changing of technical specs.
2. All the specs can be customized according to client's requirements.

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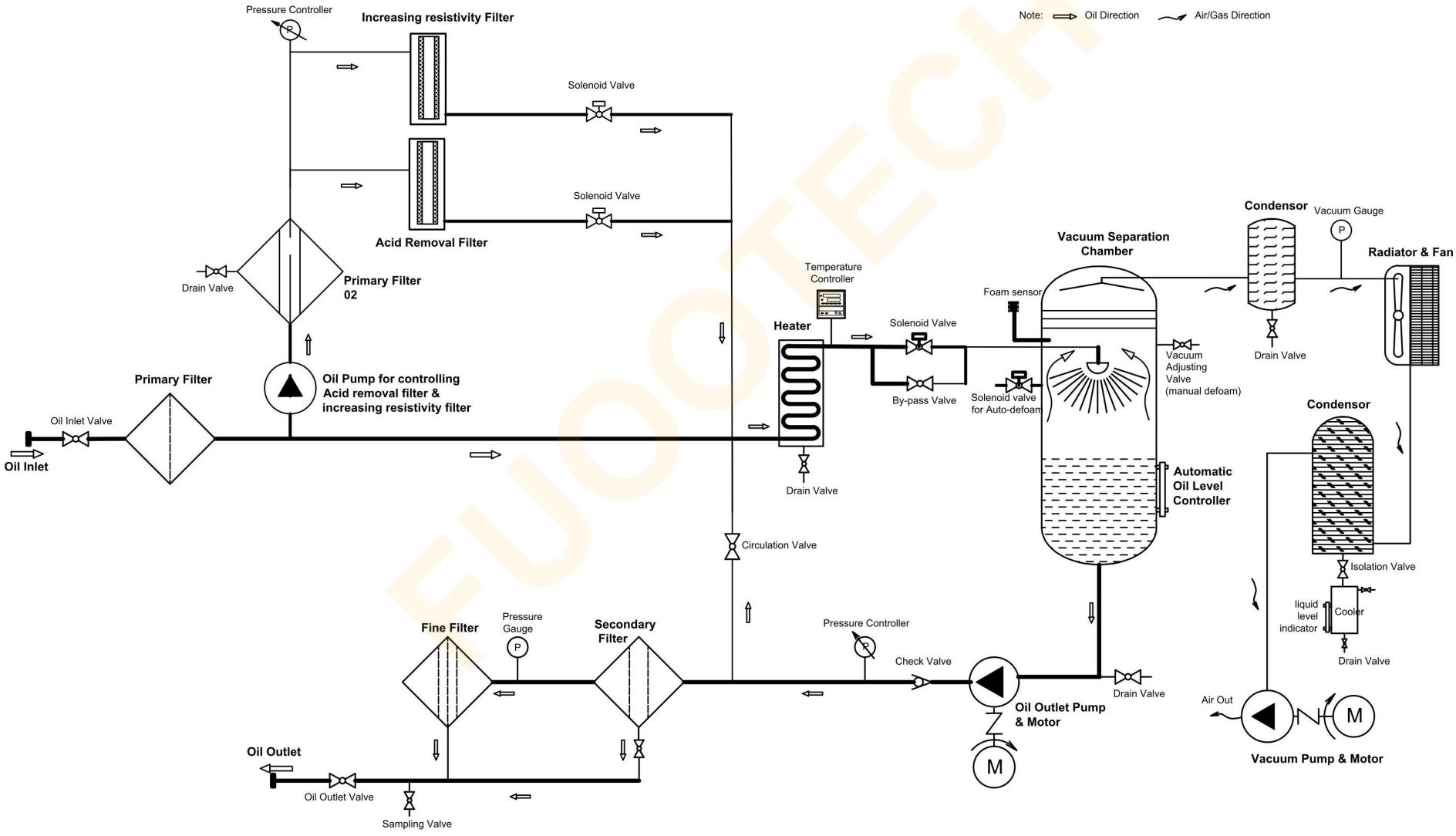
Flow Diagram



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