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FuooTech Oil Filtration Group Limited

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# Series ZYD Double-stage Vacuum Transformer Oil Filtration Machine

(Specially for Filtering Transformer oil, Insulating oil, Cable oil, Dielectric oil, high vacuum filtration, heating, dehydration & drying, degassing, oil filling, vacuum pumping)



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## I. Company Profile

**FuooTech Oil Filtration Group Limited** is a leading oil purifier manufacturer in China, which engages in developing, producing, selling a series of oil purifier such as transformer oil purifier, turbine oil purifier, engine oil purifier, lube oil purifier and so on. We practice in this line for ten years, so we have a strong technology and gain rich experience. Our products have been exported to many countries, and get a high reputation.

Since the foundation of our company, under the duty of devoting our efforts to develop the advanced purifier for saving energy sources, adopting the advanced management like SUBI, and with the reliance on the strong technical force, advanced equipments of production, perfect quality check method, fast and outstanding after-sales service, our company has developed into a national big base specialized in producing oil purifier. Our products are outstanding because of its excellence in quality, stability in service, and diversity of products.

**FuooTech Oil Filtration Group Limited** owns a number of national-class oil purifier experts and experienced engineers. Encouraged by the company's modern management mechanism, we have developed six big series, including hundreds of models oil purifier equipments which have the independent property right and advanced filter technology. Those equipments can be applied to many fields, such as the electric power, petroleum chemical, metallurgical industry, mine, aviation, shipping and railway, and so on.

We adhere to the tenet of mutual-benefit and both-win. With the sincere and pragmatic work attitude, we would like open up new Sci&Tech oil purify era with our customer.

## II. Application and Features

### Application

As is well known the Transformer plays an important role in the generation, transmission and distribution of electrical energy. Under load the transformer, dissipates heat and the insulating oil acts as a coolant as well as an effective dielectric.

Due to the highly hygroscopic nature of the transformer oil, it absorbs moisture from windings, which leads to gradual deterioration of dielectric strength. Also there are some waste impurities, gas contents in the transformer oil which destroy the oil's quality.

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The FuooTech Vacuum Transformer Oil Purifier (Series ZYD) has been specially designed for on site use to completely regenerate insulating oils in energized or de-energized transformers even when transformer power both below and above 110KV and altitude over 500 meters, as well as purify mutual inductor oil, switch oil and so on. Also it can inject the insulating oil into the transformers on-line and dry the transformer.

The ZYD system not only provides regular oil purification/ reclamation such as degassing, drying and particulate removal, but also can remove acidity, sludge, carbon deposits, sulfur, and other soluble oil decay products and improve physical & chemical properties comparable to new transformer oil.

This is accomplished by the use of high vacuum degasification technology and particulate filters combined with our special brand of earth. After treating, the oil can be reused as new.



**Features:**

1. Double-stage, high vacuum pressure and high flow rate.
2. Adopts Duplex 3D stereo-evaporation & flash distillation technique, eliminating the liquid water & gas content quickly.
3. Besides the common vacuum oil purifier's function of dewatering, degassing and eliminating particles, this machine can regenerate the seriously deteriorated oil by removing the polarity materials, such as the deep oxides, free carbon in the oil effectively. It can make the seriously deteriorated oil reach to the normal index like anti-oxides, acid-alkali water-solubility.
4. UK G technology by which the trace water that is show chain, such as dissolved water, can be removed effectively.
5. Distinctive removing impurities system filtering through double FH trapezoidal network and absorbing by high polymer without the mechanical power. Precise fine multi-stage filtration for removal of solids, water and gasses
6. Carbon fiber infrared heating system that can make the oil contains zero sum of ethyne after the treatment
7. Especially applied to vacuum oil injection and drying (Hot Oil Circulation / on-site Drying) for power transmission equipments which are over 110KV
8. Contains Transformer Evacuation System
9. Advanced dielectric Condenser devices, Automatic pressure protection, automatic constant temperature control, automatic oil level control
10. Low maintenance cost and time, simple operation and maintenances.
11. Can be operated both on-load and off-load, PLC making machine run fully automatically is optional.
12. This Oil purifier can be made in mobile type with trailer, hermetical, canopy-covering, open and frame style.

**Advantages:**

Comparing with the single-stage vacuum oil purifier, this machine dewater, degas and removes the impurities more quickly, more completely, and makes the oils limiting voltage-withstand value much higher. As the bridge-type vacuum linking system that can purify and also can be an independent vacuum power supply, this machine can treat the electric insulation devices.

**III. Machines' Technical Data Guarantee**

Parameters	Model Unit	ZYD-30	ZYD-50	ZYD-100	ZYD-150	ZYD-200	ZYD-250	ZYD-300
Flow Rate	L/H	1000 ~ 2000	3000	6000	9000	12000	15000	18000
Working Vacuum Degree	MPa	-0.08 ~ -0.099						
Working Discharge Pressure	MPa	≤ 0.3						
Temperature Control	°C	20 ~ 80						



Range									
Operation Temperature	°C	40 ~ 70 (65°C is best)							
Power Supply		380 VAC, 3 Phase, 50 Hz (or as per your requirements)							
Working hours without Trouble	Hour	4000							
Continuous Working Hours	Hour	150							
Ambient Temperature		-25 ~ 55°C							
Working Noise	dB (A)	65 ~ 90							
Heating Power	KW	24	30	48	60	72	80	120	
Total Power	KW	26.5	33	52.5	68	82	93	135	
Inlet/Outlet	mm	φ25	φ32	φ42	φ50	φ50	φ60	φ60	
Weight	Kg	600	700	1050	1150	1450	1600	1950	
Overall	Length	mm	1380	1610	1750	1850	1950	2050	2200
	Width	mm	1020	1250	1350	1400	1500	1600	1750
	Height	mm	1760	1950	2150	2200	2300	2400	2550

The dimension and weight will be changed with changing the technical specification

#### IV. Oil Data Before and after Treatment

Parameter	Used Oil	After Treatment
Moisture (Water Content)	≥120 ppm	≤ 5 PPM
Gas Content	10%	≤0.01% (Vol)
Impurities Degree (Filtration precision)	2%	≤ 5 micron (no free carbon)
Breakdown Voltage (Dielectric)	25 kV	≥70 KV
Flash Point	70	≥145°C
Cleanliness	NAS 1638 Grade 10	≤NAS 1638 Grade 5

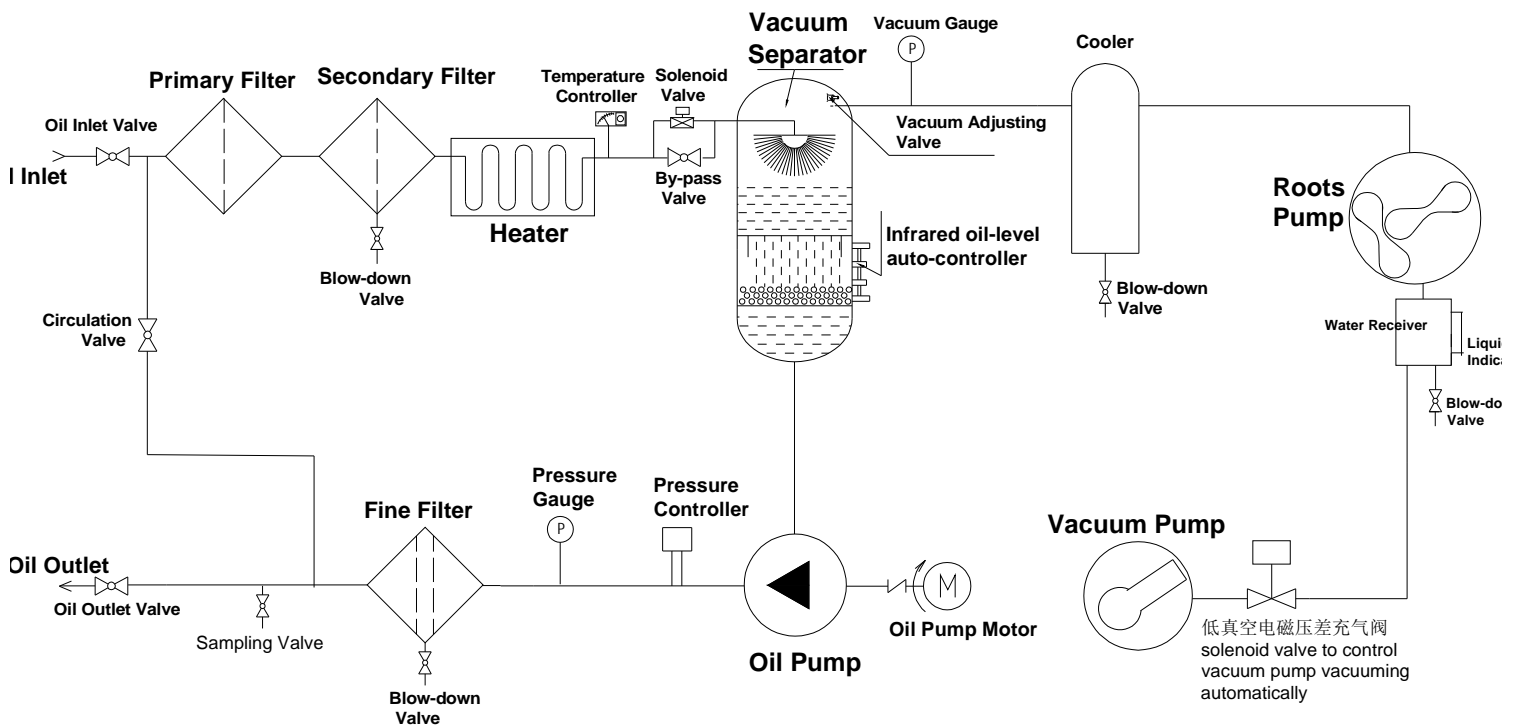
#### V. Working Principle and Structure



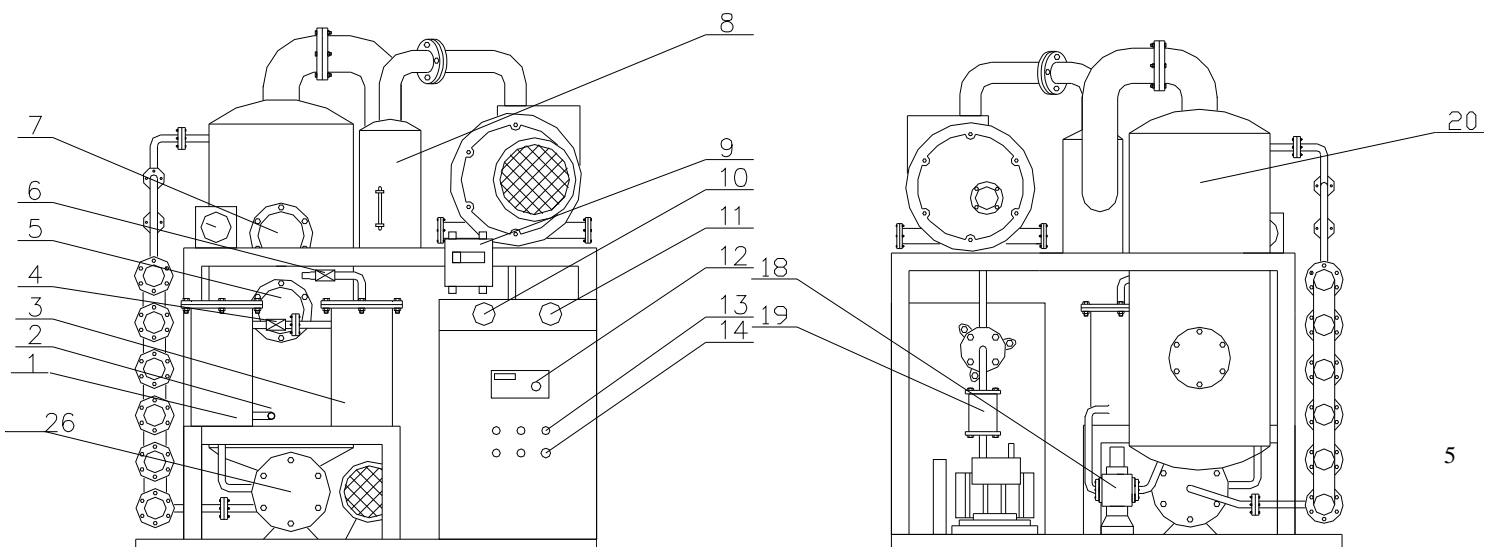
## 1. Working Principle

When this machine start working and vacuum degree is upto the set value, the used oil will be sucked into the primary filter & secondary filter under the pressure difference, the primary filter & secondary filter will remove the big size impurities/ particles, then the oil which just contains the tiny particles is heated by the heaters. Then the heated oil enter into the vacuum separator, through the function of vacuum pressure and degassing system, the moisture content in the oil, which is vapoured & separated from the oil quickly, is either discharged under the process of the vacuum system or refrigerated to liquid water into water receiver, meanwhile degasification work is completed. The last procedure is that the fine filter removes the tiny impurities completely. Finally, clean oil goes out through the oil outlet.

## 2. Flow Chart of Series ZYD



## 3. Machine Structure Chart for series ZYD

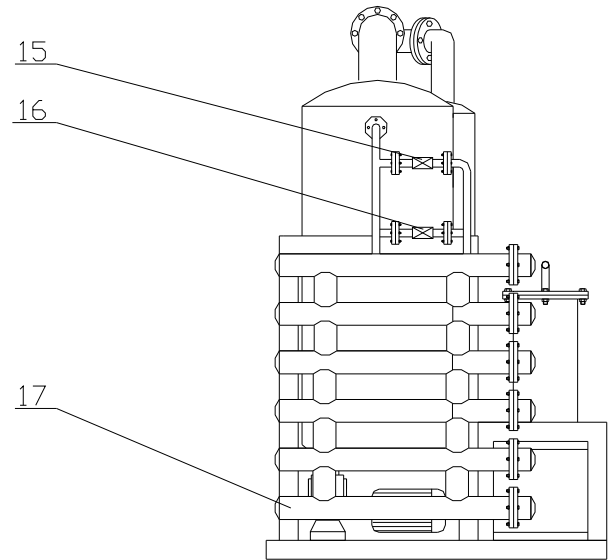
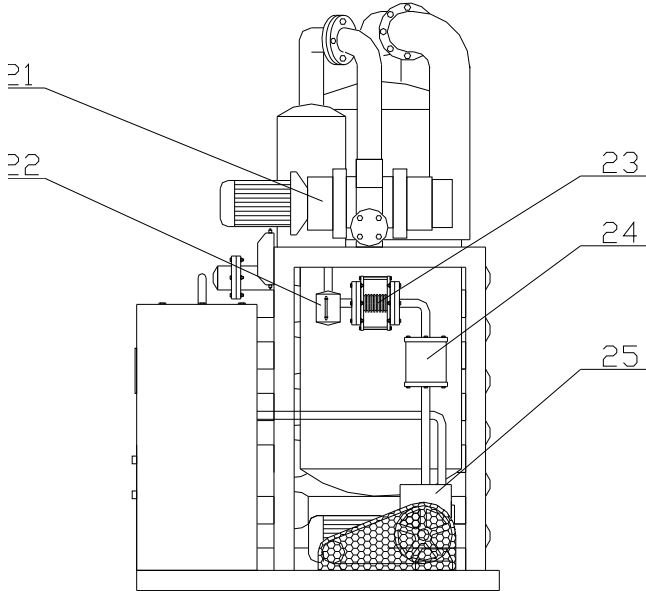




(Front Side)

(Back Side)

1. Primary Filter 2. Oil Inlet 3. Fine Filter 4. Return Valve 5. Observe Hole (1) 6. Oil Outlet 7. Observe Hole (2)  
 8. Cooler 9. Pressure Indicator for filter 10. Vacuum Gauge 11. Pressure Gauge 12. Temperature gauge 13.14. Control Button 18. Oil pump 19. Single Way Valve 20. Vacuum Vessel 26. Secondary Filter



(Left Side)

(Right Side)

15. Solenoid valve 16. By-pass Valve 17. Heater 21. Roots Pump 22. Water receiver 23. Ripple Compensator  
 24. Single Way Valve 25. Vacuum Pump

## VI. Machine's Main Advanced Technologies

### I Unique Dehydration (Degas) System

We adopt Duplex 3D stereo-evaporation technology whose the evaporation area is three times more than that of normal evaporation technology. This innovation can dehydrate and degas effectively and efficiently.

Meanwhile, we bring in UK G technology from Japan which eliminates the kinds of trace water content and dissolved water thoroughly so as to increase the breakdown voltage and anti-pressure value enormously, ensure the transformer oil can be used in high level transformer normally.

Sight Glass installed for observation of oil evaporation and oil flow level.

Effective vacuum adjusting valve is designed specially for adjusting suitable vacuum degree inside of vacuum chamber according to actual operation condition.

Blow-down valve and safety valve equipped for necessary operation while use.

### I Distinctive Filtering System

The filtering system, which is combined double FH trapezoidal network with **H.P.M high molecule polymer material absorbing**, distinctively remove more than 99% of various impurities and particles. It improves the effectiveness of filtering and extends the lifetime of filter awfully.



**A: First-stage Filter**

Made of Stainless steel material, Double FH trapezoidal network filtering technology, it removes particles and impurities down to 80 microns.

**B: Second-stage Filter**

Made of Stainless steel material, Double FH trapezoidal network filtering technology, it removes particles and impurities down to 20 microns.

**C: Fine Filter:**

Made by High Polymer Materials and imported from Germany, thorough demulsification and separate water from the waste oil, it removes particles and impurities down to 5 microns, making oil clean.

Also other filters can be designed to install on the machine according to customer's actual requirements.

**I High performance of Vacuum pump system**

Double stage vacuum pump system keeps oil filtration machine operation with high performance at the high vacuum status.

The integral vacuum pump system consist of a rotary vane vacuum pump and a booster roots pump, keep the machine's filtration jobs at high vacuum degree, meanwhile pumping air out from the transformers is also available. All these vacuum pumps' works can be customized according to the actual operation condition and client's requirements.

Rotary vane vacuum pump can be chosen as Germany Leybold Vacuum Pump Brand with much higher quality and low noise as option.

**I Electrical Control System & Control Panel (Cabinet)**

Electrical control system is one of the most important parts for oil filtration machine, which control and protect the whole filtration process, keeping danger away from operators.

All the electrical parts are chosen and compared by our professional electrical engineers from hundreds of brands products, currently we mainly choose CHINT and Germany Schneider brands. And the wiring & installation of electrical parts are well designed according to operators' operation habit.

All Electrical Control Gear, Mains Isolating Arrangement, Starters, Contactors, Fuses, Relays, Indicating Lamps and Interlocking, etc... are well housed in a Compact Control Cabinet, as well as the lights, pushing buttons, vacuum gauge, pressure gauge, temperature controller screen, indicators, etc.. are also well installed on the control panel.

German 3UG3 Relay keep the machine safe working efficaciously at any situations such as power off, lack of phase, wrong phase position, etc...

**I Carbon Fiber Infrared Oil Heating System**

Heating by Carbon fiber infrared heating system which is the most advanced heating technology, the unique heater structure heats the oil uniformly and easily controlled, it gives out the heat quickly (in 3 seconds after power on) and Efficiency of electricity transforming to heat is very high (more than 98%).

Oil Heater System assures less than 1.0 w/cm<sup>2</sup>. During the heating process, the deterioration of the oil caused by





overheating is avoided. The oil temperature can be adjusted between 0 ~ 100°C. The heater is controlled manually or automatically. The heater will stop automatically when the oil temperature reaches a certain degree. Being installed with safety protection devices, the heating system is secure and reliable. The heater will stop operation automatically when the oil volume of inlet is too low to avoid the damages of the heater.

The material is good at oxidation resistance at high temperature and can be used for more than 10 years.

### **I Double-infrared fluid level auto-control system instead of oil-level controlled by manually and float valve**

Double-infrared fluid level auto-control system is installed in the vacuum vessel to control the oil level automatically so as to avoid the oil leaking in the operation. It can help machine working continuously for 150 hours even online without worker monitor. The new innovation of eliminating froth can avoid the oil ejecting and gushing during the process.

### **I High Quality components**

The main component parts of our products such as vacuum pump, oil pump and electric apparatus are from SIEMENS, ABB, SCHNEIDER, Zhongneng and AMICO etc. Kinds of brands are optional according to customer's specific requirement. It ensures our products high quality and reliability.

Some extra components are available to install on our oil filtration machine as per client's requirements, such as flow meter, PLC, hooks, doors, covers, alarms, special Logo, etc...

### **I Structure and Appearance of Oil purifier**

Our products adopt ship-shape chassis-mount structure to ensure oil leak proof and protect the environment from pollution. The whole equipment is characterized by small size, light weight and convenient to move around.

Available in mobile option, immovable option and trailer, etc...

Oil purifier can be made in hermetical, canopy-covering, open and frame style, etc...

Color of the oil purifier can follow customer's favor.

Available in installing PLC controller for making machine operation Fully-automatically

Equipped with Explosion Proof Materials when the machine is used in hazardous areas is optional

### **I Cooler, Dielectric Condensation System**

The system is composed of cooler, condenser, water receiver etc

The vapor and other gas, which is evaporated from vacuum separator, first drop in temperature and are rid of moisture in dielectric condenser whose decalescence medium changes water vapour changes to liquid water quickly, then are condensed again in cooler.

The reductive condensed water is discharged by water receiver. The dry gas, which are condensed and rid of moisture twice, are discharged to air by vacuum pump so that it protects vacuum pump.

## **VII. Operation Introductions**

- 1). The environment/ ambient temperature is between -25 ~ 45°C when the machine is working.
- 2). The altitude height of the working point will influence the vacuum degree of the machine directly. The higher the altitude height is, the lower the vacuum degree is (negative value).





3). The used oil can not be too dirty (the oil doesn't have too many impurities), otherwise it should use other purification plant to filter sufficiently such as JL Portable Oil Purifying and Oiling Machine. The measure avoids influencing the efficient of degassing and the lifetime of the machine.

## VIII. Contact Details:



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<http://www.fuoo.net>

## IX. Our Machines Using at Customer Sites



Our ZYD Series Machine  
in Saudi Arabia



Our ZYD Series Machine  
in Kuwait



**Our ZYD Series Machine  
in South Africa**



**Our ZYD Series Machine  
in Laos**



**Our ZYD Series Machine  
in Jordan**



**Our ZYD Series Machine  
in Philippines**



**Our ZYD Series Machine  
in Cambodia**



**Our ZYD Series Machine  
in Papua New Guinea**



## XI. Training & Commissioning at Client's working site:

### 1. In Karachi, Pakistan



### 2. In Dubai, UAE



### 3. In Laos



### 4. In PNG





### 5. In Nigeria



### 6. In Bangladesh



**For More Info, Please Don't Hesitate to Contact Us.**