



ZYD-S SERIES

Transformer Oil Regeneration & Decoloring Machine

Application

ZYD-S Transformer Oil Regeneration & Decoloring Machine, developed by FUOTECH® in 2007, is specially designed for the completely regeneration of insulating oils in energized or de-energized transformers. It not only provides regular oil purification including degassing, drying and particulate removal but also removes acidity, sludge, other soluble oil decay products, and improves color. For special application at outside field, the system also can be mounted on a leak proof base or be installed and operated on a trailer.

The FUOTECH Series ZYD-S High Effective Transformer Oil Regeneration and Decoloring Machine is a combination of a high vacuum oil dehydrating and degassing system, a powerful filtering system, and an oil regeneration system. It is applied to process transformer oil and insulating oil from power plant, power station, electric power company, power transmission equipment, transformers, industrial and mining enterprises, especially suitable for on-site installation, maintenance and purifying high level new oil, or running oil from big power transmission and distribution equipment and transformers on national main power transformation grid, which is above 110-750KV. It can shorten the oil treatment period for transformer installation and maintenance.

Why Transformer Oil Need be Regenerated?

The increasing rating requirements of modern transformers and electrical apparatus results in greater electrical stress in insulating material and fluids. In order to handle these greater stresses, oils are required to have better dielectric strength, and lower residual water content must be maintained. The timely and proper treatment of these insulating fluids will result in the improvement of the properties of the entire insulating system of power transformers.



The principal functions of the insulating fluid are to serve as a dielectric material and an effective coolant. To perform these functions, the insulating fluid must have specific necessary qualities at the time of initial impregnation and filling at the factory, which must be maintained at the same quality level in field operation if optimum performance is to be assured.

Transformer oils deteriorate with time. High operating temperatures, the presence of oxygen and water combined with the catalytic action of the materials within the transformer, result in oxidation and cracking of the oil. The by-products of oxidation are acidic and the long-term effect of these by-products results in an exponential increase in deterioration of the transformer and its oil. The resulting sludge build-up reduces the cooling effects of the oil driving the whole decay mechanism at an increasingly accelerated rate. The acid number becomes exponential around the 0.25 mg KOH /g oil level and color gets dark. Preventative measures must be undertaken prior to the oil acidity level climbing to this point. Generally, the larger the transformer plate rating, the lower the acid number that triggers regeneration of the oil.

The **FUOOTECH ZYD-S Transformer Oil Regeneration and Decoloring System** provides an extremely cost-effective and environmentally acceptable method of extending transformer oil lifetime to over 20 years!

Features

1. For special application, the operation can be controlled by P.L.C (Programmable Logic Controller).
2. Unique vacuum dehydration, degassification and regeneration system, adopt stereo-evaporation technology. Duplex 3D stereo-evaporation, eliminating the liquidwater quickly.
3. UK G technology by which the trace water that is show chain, such as dissolved water, can be removed effectively.
4. Advanced liquid-level automatic control system to accomplish fully automatic control of oil level.
5. Can be applied for vacuum oiling and drying power transmission equipment.



6. Special additives for depolarization can recover oil color of aged transformer oil to new.
7. Filter rated up to 1 microns prevents particles from entering back into the transformer.
8. Human oriented design, making the whole operation easily.

Working Principle

The insulating oil is conveyed into the degassing tank by means of pressure difference. Oil is indirectly heated by the heater, thus avoiding hot spots and over-swinging of the pre-selected operating temperature. The special degassing system and geometry with several stages in degassing tank creates a large oil surface and a resulting thin film for most effective maximum degassing. The treatment with a lower end vacuum (-0.08 to -0.095 MPa) guarantees, among others, that no light fractions are evaporated in the insulating oil, whereby the required characteristics of the oil are not changed.

The oil level regulation in the degassing tank assures a continuous oil flow-through in the plant, thus resulting in an optimised degassing of the oil.

After degassing and dehydration under vacuum, the oil is conveyed by means of a specially sealed and frequency controlled pump into regeneration system. Then oil is pumped through the fine filter and out of the plant.

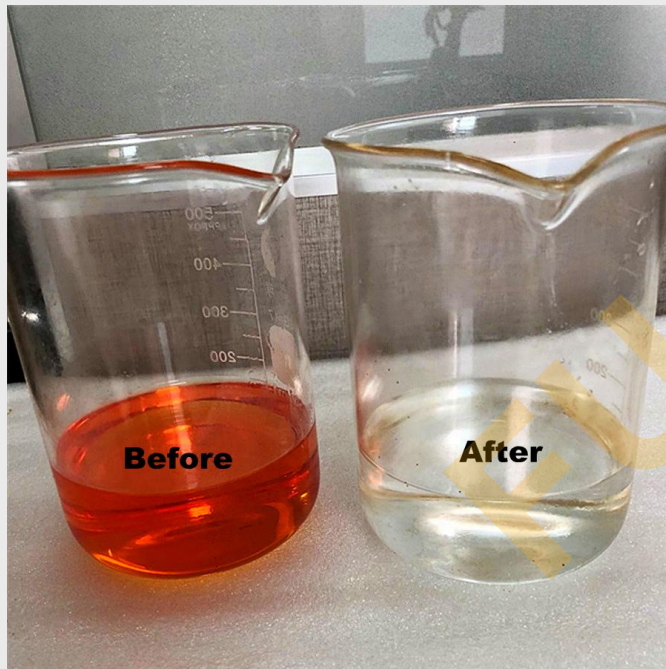
Expectations and Benefits on ZYD-S Plant

- Elimination of residual gas from the insulation.
- Drying of transformer insulation.
- Easy and failsafe operation.
- On-line measuring and recording of process parameters.
- Flexibility in application (various oil types and oil volumes)
- Regenerate your transformer oil high efficiently
- Maintain your transformer oil always in good status, extend the oil's lifespan

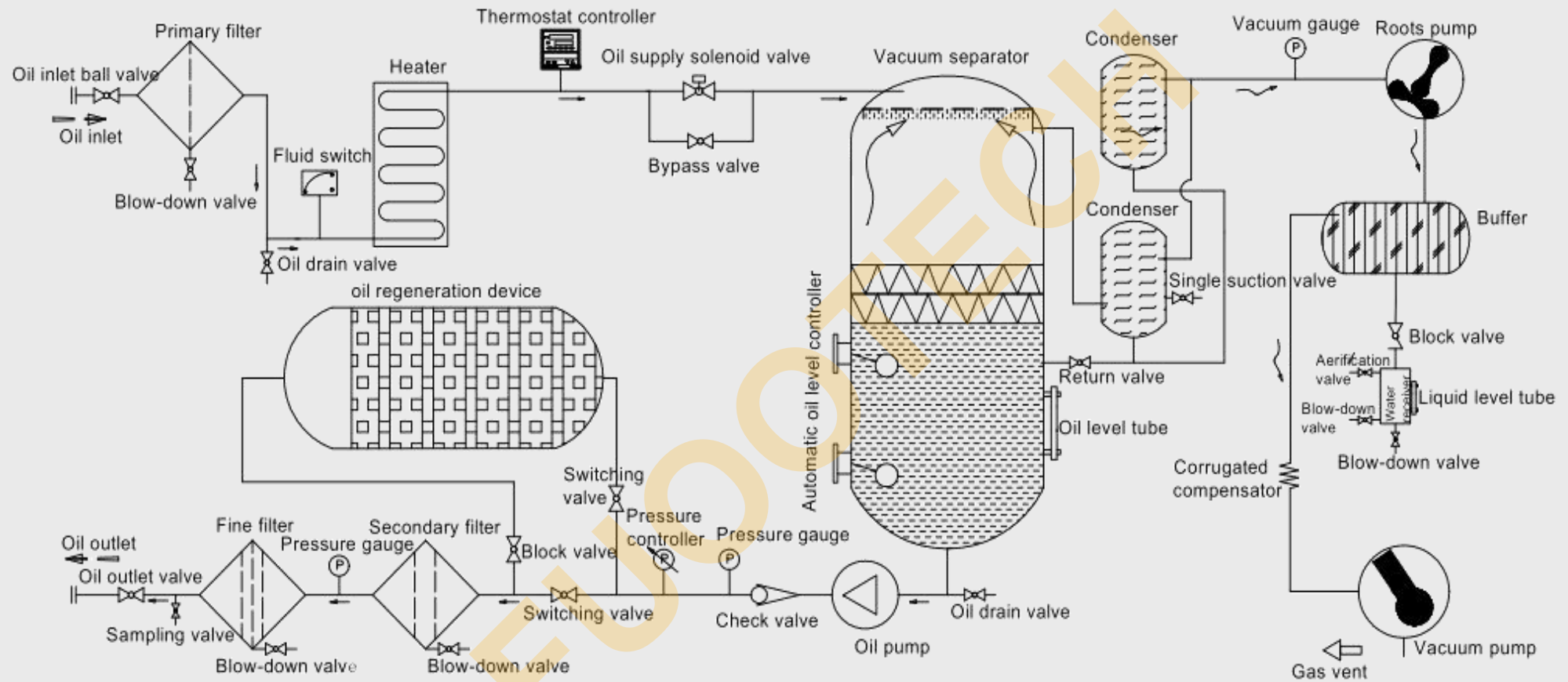


- Reduce and save oil costs in terms of consumption, replacement and inventory
- Solve your waste transformer oil disposal problem
- Ensure your transformers working normally with qualified oil properly
- Protect your transformers and power equipment from oil pollution problems
- Reduce your maintenance time, energy and cost on transformers and power plant
- Create a safety and cleaning oil-using environment for your transformers of power station
- Bring a green oil ideal to the world and save oil energy for the world

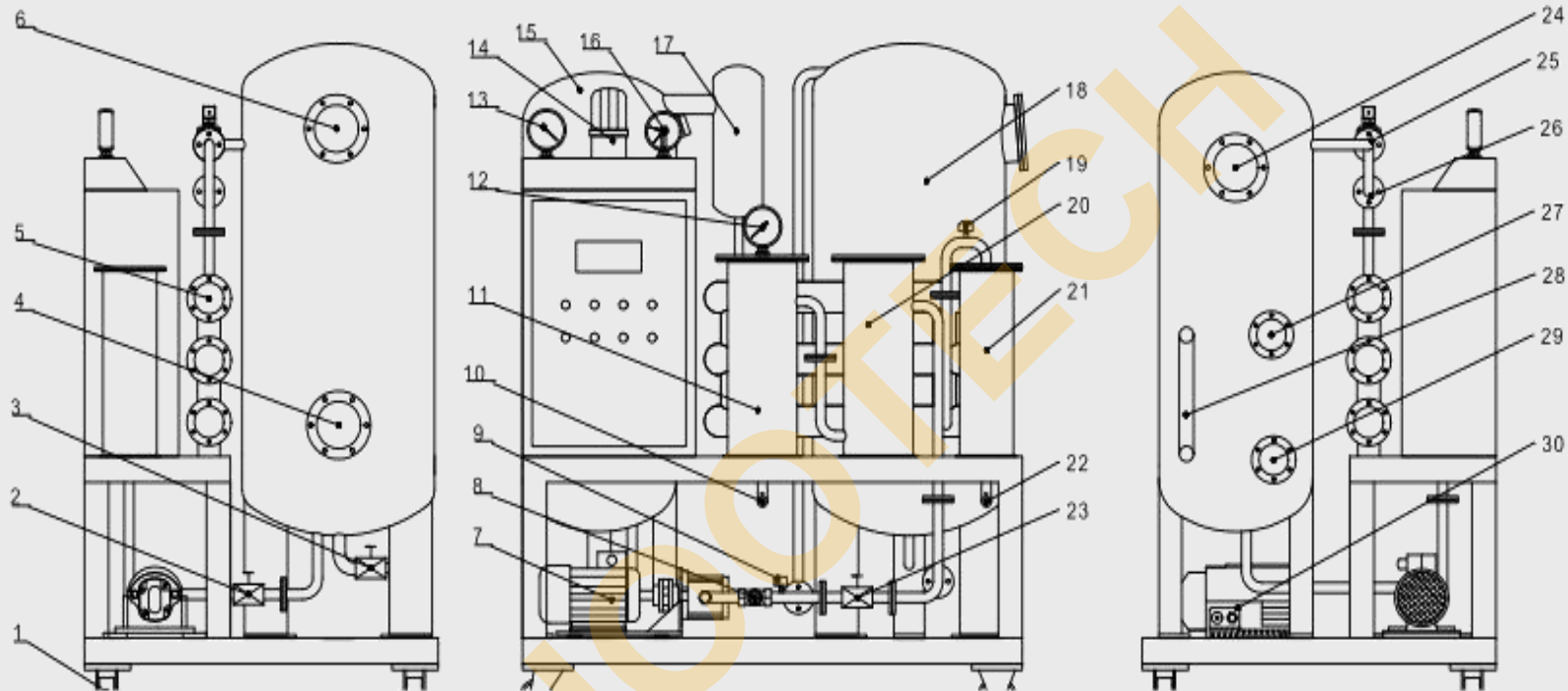
Oil Comparison before and after ZYD-S Plant



Flow Diagram



Structure Diagram



- 1.Caster 2.Block valve 3.Blow-down valve 4.Discharge port 5.Heater 6.Feed port 7.Pump motor 8.Check valve 9.Pressure switch 10.Oil outlet 11.Fine filter 12.Pressure gauge 13.Vacuum gauge 14.Alarm light 15.oil regeneration device 16.Electrical contact pressure gauge 17. Condenser 18.Purification unit 19.Fluid switch 20.Secondary filter 21.Primary filter 22.oil inlet 23 Block valve 24.Observation hole 25.Solenoid valve 26.Bypass valve 27.Upper liquid level float ball 28.Oil level tube 29.Lower liquid level float ball 30.Vacuum pump

Recommended Testers for Transformer and Transformer Oil

Part I: Oil Testers

- ✧ Transformer Oil BDV Tester
- ✧ Transformer Oil Trace Moisture Content Tester
- ✧ Transformer Oil Acidity Tester
- ✧ Transformer Oil Interfacial Tension Tester
- ✧ Transformer Oil Flash Point Tester (Open/Closed Cup)
- ✧ Transformer Oil Tan Delta Tester
- ✧ Transformer Oil DGA (Dissolved Gas Analyzer) Tester
- ✧ Transformer Oil Kinematic Viscosity Tester
- ✧ Transformer Oil Density Meter
- ✧ Transformer Oil Particle Counter
- ✧ Sf6 Gas purity and Decomposition Tester
- ✧ Portable Dew Point Meter

Part II: Transformer & HV Testers

- ✧ Transformer Load and No Load Loss Tester
- ✧ TTR Transformer Turns Ratio Tester (Portable/Handheld Type)
- ✧ Transformer DC Resistance Tester 1 ~ 100A
- ✧ Transformer Tan Delta and Capacitance Tester 0 ~ 12kV
- ✧ CT PT Analyzer
- ✧ SFRA Transformer Sweep Frequency Response Analyzer
- ✧ VLF Hipot Test Set 30 ~ 120kV
- ✧ Insulation Resistance Tester 0.25 ~ 30kV
- ✧ AC Hipot Tester
- ✧ DC Hipot Tester
- ✧ Circuit Breaker Contact Resistance Tester
- ✧ Grounding Earth Resistance Tester