Vacuum Lubricating Oil Purifier
Series TYA

High Vacuum Oil Dehydration & Degassing System Combined With Water Separator, and 3 Stages Filters to Remove Impurities Completely and Eliminate Moisture, Break Emulsification Fast and Effectively.

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I. Application and Features

Application:
This Oil Purification Unit is designed for purifying all kinds of used oil such as lubricant oil, hydraulic oil, engine oil, motor oil, car oil, petrol oil, diesel oil, fuel oil, gasoline oil, compressor oil, mechanical oil, coolant oil, gear oil, mechanical oil, heat treatment oil, mixed waste oil, dirty industrial oil, waste cooking oil, and so on.

According to the used oil's nature, this machine can rapidly and completely remove water content, particulate matters, impurities and air, gas from the lube oil, and break emulsification fast and effectively.

After the treatment, the final treated oil can be reused again with good oil features and its oil parameter comes very close to new lube oil's standard. You can use the treated fresh oil back to your engines, lubricating systems normally as it is used before, and also many other machinery systems, engine systems, or any other use purpose based on the refreshed oil recovered index quality.

Features:
1. With the strong ability to filter the impurity, which can filter the particles completely.
2. It has the back flush system, which can clear impurities and clean filters automatically.
3. Advanced dielectric condensation device
4. This machine installs the new pressure protector, which can control the temperature automatically; also it can drain water on line by the water—separator device. So it is easy to control this machine.
5. We adopt the high quality filter materials, which has a good function in anti-corrosive, thermostable, mechanical strength. Especially, the precision of eliminates impurity is high and the service life is long. Also, it has a large volume for storing the impurities
6. The unique degas and dewater system: Using the Stereo-Evaporation technical, which can separate the water and gas from the oil quickly by the Multi-level water-oil separation technology.

Advantages:
This oil purification machine can fast dewater, degas, and remove the impurities and tiny particulates and the volatile matter (for example ethyl alcohol, gasoline, ammonia and so on). It can enhance the oil quality, restores the lubricating oil's viscosity, augments the flash point and improves the operational performance. And guarantee your hydraulic system, dynamic system, and the lubrication system in normal operation with purified high quality oil, so the machine is suitable for many lines, such as the mine, metallurgy, electric power, transportation, manufactures and so on.
II. Working Principle and Structure

1. Working Principle

When it starts working, the used oil will be poured into the heater to heat under the vacuum pressure, then the heated oil enter into the primary filter which will eliminate the big impurities, then the oil enter into the vacuum separator the oil will flow the special radiation device, which make the unit/volume oil to produce a large surface area, lets the pollution oil exposure in the low humidity atmosphere, thus the water, air and gas can be eliminated. The treated vapor and gas form the gaseous mixture becomes the liquid through the water tank and the chiller condensation, then the liquid enters water receiver together, the vacuum extracts the surplus gas.

The oil which is drained away water flow into precision strainer where can exhaust particulates (oil purification). According the quantity of the water content, a whole purification needs many times circulation to drain away the water.

2. Flow Chart

![Flow Chart Image]

1-19 Control valve, Sample valve, Drain valve, Electromagnetic valve
3. **Structure Chart**

**FRONT VIEW**
1, 2, 3, 13: Control Valve
4, 5: Primary Filter
6: Pressure Controller
7: Pressure Gage
8: Temperature Gage
9: Distribution Box
10: Water Receiver

**LEFT VIEW**
11: Electric Fan
14: Magnetic Fan
15: Protective Cover
16: Condenser
17: Fine Filter
BACK VIEW
18,19,20: Control Valve
21: Fine Filter
22: Protective Cover
23: Infrared Controller
25,26,27: Control Valve
28: Oil Tank

RIGHT VIEW
29: Vacuum Dehydration Separator
30: Oil Pump
III. Machines’ Technical Data Guarantee

<table>
<thead>
<tr>
<th>Item</th>
<th>Model Unit</th>
<th>TYA-10</th>
<th>TYA-20</th>
<th>TYA-30</th>
<th>TYA-50</th>
<th>TYA-100</th>
<th>TYA-150</th>
<th>TYA-200</th>
<th>TYA-300</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flow rate</td>
<td>L/Hr</td>
<td>600</td>
<td>1200</td>
<td>1800</td>
<td>3000</td>
<td>6000</td>
<td>9000</td>
<td>12000</td>
<td>18000</td>
</tr>
<tr>
<td>Vacuum degree</td>
<td>Mpa</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-0.06 ~ 0.095</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Working Pressure</td>
<td>Mpa</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>≤0.4</td>
</tr>
<tr>
<td>Temperature Degree</td>
<td>°C</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0 ~ 100</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power Supply</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>380V, 3phase, 50HZ (or as required by customer)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Working noise</td>
<td>DB (A)</td>
<td>≤75</td>
<td>≤75</td>
<td>≤75</td>
<td>≤78</td>
<td>≤78</td>
<td>≤80</td>
<td>≤82</td>
<td></td>
</tr>
<tr>
<td>Electric heating Power</td>
<td>KW</td>
<td>18</td>
<td>18</td>
<td>24</td>
<td>30</td>
<td>54</td>
<td>72</td>
<td>90</td>
<td>120</td>
</tr>
<tr>
<td>Total electric Power</td>
<td>KW</td>
<td>19.3</td>
<td>19.3</td>
<td>25.65</td>
<td>32</td>
<td>57.1</td>
<td>79</td>
<td>98</td>
<td>130</td>
</tr>
<tr>
<td>Inlet (outlet) Caliber</td>
<td>mm</td>
<td>Φ25</td>
<td>Φ25</td>
<td>Φ25</td>
<td>Φ32</td>
<td>Φ42</td>
<td>Φ50</td>
<td>Φ50</td>
<td>Φ60</td>
</tr>
<tr>
<td>Size</td>
<td>mm</td>
<td>1260x900x600</td>
<td>1260x900x1600</td>
<td>1500x1250x150</td>
<td>1600x1150x700</td>
<td>1750x1250x1800</td>
<td>1900x1600x1950</td>
<td>1900x1700x2000</td>
<td>2100x1700x2100</td>
</tr>
<tr>
<td>Weight</td>
<td>Kg</td>
<td>450</td>
<td>550</td>
<td>600</td>
<td>750</td>
<td>850</td>
<td>1000</td>
<td>1200</td>
<td>1500</td>
</tr>
</tbody>
</table>

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

IV. Oil Data after Treatment

<table>
<thead>
<tr>
<th>Item</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moisture (water content)</td>
<td>≤ 50 PPM</td>
</tr>
<tr>
<td>Gas Content</td>
<td>≤0.1%</td>
</tr>
<tr>
<td>Impurities Degree (Filtration precision)</td>
<td>≤1 ~ 5 micron (no free carbon)</td>
</tr>
<tr>
<td>Demulsification</td>
<td>New oil ≤15min, running oil ≤30min</td>
</tr>
<tr>
<td>Cleanliness</td>
<td>≤NAS 1638 Grade 6</td>
</tr>
</tbody>
</table>

This specification describes the equipment supplied by Zhongneng for the processing (degasification, dehydration, filtration) of used lube oils. The TYA purifiers are designed for processing oils in workshops or in the fields.
V. Machine’s Main Advanced Technologies

- **Unique Vacuum 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 oil quality and ensure the lubricating oil can be used normally again without any problems caused by water contaminants.

- **High-tech Demulsification**
  The quality of the lubricating oil purifier depends on the technology of breaking emulsification by the machine, if the machine cannot break the emulsification, it cannot dewater at all.
  Many traditional factories usually adopt two methods to solve this problem, one is to add the Emulsion-breaking agent or use the glass fiber cotton. But there are two defects by adding the emulsion-breaking agent: One is to damage the oil, the other one is that the oil will be emulsified again after putting the emulsion-breaking agent.
  Although it can break the emulsion by using the glass fiber cotton, the emulsion-breaking filter’s life will be short and changed more often because of its easy-blocked disadvantage.

  Our company adopts **H.P.M high molecule polymer material** breaking emulsion, it contains a large number of active elements of free verse polymer materials, these free verse polymer materials can directly go into the emulsion oil emulsified oil will be cut off of molecular chain, separate the Oil molecules and water molecules, it easily solve the problem of emulsion. And it won’t damage the oil, and use repeatedly without exhausting any supplies.

- **Distinctive Filtering System**
  The filtering system, which is combined double FH trapezoidal network with **H.P.M high molecule polymer material absorbing for demulsification**, distinctively remove various impurities, particles and water content. The filtering system owns back flush function to clean the filters and clear the impurities automatically. 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 15 microns.

  B: **Second-stage Filter**
  Made of Stainless steel material, Double FH trapezoidal network filtering technology, it removes particles and impurities down to 5 ~ 10 microns.

  C: **Coalescence & separation Filter**
  Made by lignocellulose and imported from Italy, separates and removes 80% of visible water content in the waste oil directly and effectively.

  D: **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 1 ~ 5 microns, making oil clean.

- **Safe Electrical Apparatus Controlling System & German 3UG Relay**
  All brands (made in China, in Siemens, etc…) of the main components of the electrical apparatus are available to
customers, ensure the safety of the controlling system. Having several protection systems which will avoid oil ejection, overload and over voltage etc…

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

- **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 Heating System assures less than 1.0 w/cm². During the heating process, the deterioration of the oil caused by overheating is avoided. The oil temperature can be adjusted between 0 ~ 100℃. 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.

- **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.

- **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.

- **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 hermetrical, 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

- **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.

## Main parts of the machine

<table>
<thead>
<tr>
<th>No.</th>
<th>Item</th>
<th>Performance Index</th>
<th>Brand &amp; Origin</th>
<th>Life Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Vacuum Tank</td>
<td>Degas Dewater</td>
<td>Zhongneng Z.N-ZK-005</td>
<td>Guarantee for free 1</td>
</tr>
<tr>
<td>2</td>
<td>Coalescing evaporate filter</td>
<td>Adopt Italian wooden fibre filtering material which can remove 80% water directly</td>
<td>Italy JJFLX201</td>
<td>Ten years</td>
</tr>
<tr>
<td>3*</td>
<td>Duplex 3-D Stereo Evaporation</td>
<td>The efficient of Dewatering and Degassing is 3 times quicker than that of platform</td>
<td>Germany</td>
<td>Ten years</td>
</tr>
<tr>
<td>4*</td>
<td>UK GTechnical Device</td>
<td>Eliminate the trace water</td>
<td>Japan Technology</td>
<td>Ten Years</td>
</tr>
<tr>
<td>5</td>
<td>Thin Film Evaporator</td>
<td>Increasing the water molecule size, so it is easy to vapor</td>
<td>Zhongneng Z.N-ZD-008</td>
<td>Five Years</td>
</tr>
<tr>
<td>6</td>
<td>Vacuum Pump</td>
<td>Drain up vacuum</td>
<td>Shanghai China</td>
<td>Six Years</td>
</tr>
<tr>
<td>7</td>
<td>Primary Filter</td>
<td>Removing the impurity(≥15µm)</td>
<td>Zhongneng TH8008-500 x50</td>
<td>Five Years</td>
</tr>
<tr>
<td>8</td>
<td>Macromolecule Filter</td>
<td>Removing the impurity(1-5µm)</td>
<td>Germany Du-A250*3 Q</td>
<td>Five Years</td>
</tr>
<tr>
<td>9</td>
<td>Infrared Liquid Level Control Device</td>
<td>Adjust the Oil Filtering system to balance, have the machine work without person or run with electric on-line</td>
<td>Zhongneng Z.N-ZD-004</td>
<td>Five Years</td>
</tr>
<tr>
<td>10</td>
<td>TUR4 Phase Relay</td>
<td>The Main Protector</td>
<td>Shanghai CHINA</td>
<td>Six Years</td>
</tr>
<tr>
<td></td>
<td>Product Description</td>
<td>Model Number</td>
<td>Warranty Period</td>
<td>Warranty Period Code</td>
</tr>
<tr>
<td>---</td>
<td>------------------------------------------</td>
<td>---------------------</td>
<td>----------------</td>
<td>----------------------</td>
</tr>
<tr>
<td>11</td>
<td>Back-wash System Automatic washing, Automatic remove impurities</td>
<td>Zhongneng Z.N-ZD-012</td>
<td>Ten Years</td>
<td>1</td>
</tr>
<tr>
<td>12</td>
<td>Tri-unity Protector The Main Protector</td>
<td>Zhongneng Z.N-ZD-015</td>
<td>Six Years</td>
<td>1</td>
</tr>
<tr>
<td>13</td>
<td>Temperature Controller Control the Temperature Automatically</td>
<td>Shanghai China TDW-2002</td>
<td>Five Years</td>
<td>1</td>
</tr>
<tr>
<td>14</td>
<td>Flange embed carbon infrared Heater Carbon infrared heater healing the Transformer oil</td>
<td>Zhongneng Unique Technology Z.N-JR-002</td>
<td>Ten Years</td>
<td>1</td>
</tr>
<tr>
<td>15</td>
<td>Medium condensator Cooling The Vapor into Liquid Water, Protect the Vacuum Pump From Emulsification Pollution Again</td>
<td>Zhongneng Technology (Owns Patent)</td>
<td>Guarantee For Free</td>
<td>1</td>
</tr>
<tr>
<td>16</td>
<td>Vacuum Gauge Testing Vacuum Value</td>
<td>Shanghai China (Japan Honjin)</td>
<td>Ten Years</td>
<td>1</td>
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<tr>
<td>17</td>
<td>Electric Motor</td>
<td>Shanghai China</td>
<td>Six Years</td>
<td>1</td>
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<tr>
<td>18</td>
<td>Electric Apparatus Control System</td>
<td>Shanghai China</td>
<td>Five Years</td>
<td>1</td>
</tr>
<tr>
<td>19</td>
<td>Oil Pump Oil Circulation System</td>
<td>rotary screw pump (CB-B)</td>
<td>Six Years</td>
<td>1</td>
</tr>
<tr>
<td>20</td>
<td>Flow Switch</td>
<td>Chongqing China Stainless Steel Valve</td>
<td>Six Years</td>
<td>1</td>
</tr>
<tr>
<td>21</td>
<td>Linking And Frame Connecting System</td>
<td>Zhongneng</td>
<td>Six Years</td>
<td>1</td>
</tr>
</tbody>
</table>
VI. Use Instruction

a) The ambient temperature range in working is between \(-20 \sim 45^\circ C\).

b) The altitude of the work point can affect the vacuum degree of the machine. The altitude is higher, the vacuum degree is lower.

c) 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.

VII. Maintenance

1. after a certain period of running, the machine should be checked to see whether:

   a) The electrical control system is safe and reliable;
   b) The temperature controller is sensitive, reliable and accurate;
   c) Oil seals of the pump shaft are broken with leakage;
   d) There is any blockage with the running system and any abnormal noise with pumps or related motors;
   e) There is any air or oil leakage with the oil running system and at sealing joints.

2. after each 3000 hours’ running, grease shall be replenished to prevent motors from being burnt.

3. Special vacuum pump oil or lubricating oil N46 should be used for the vacuum pump and oil replaced or replenished if necessary at any time.

4. If the machine will not be used over 1 month, Place the machine in a dry environment with the panel door and all valves closed, and the machine properly protected by a covering.

VIII. Warranty Period

WE Warrant the plant supplied under this specification against defects in material and workmanship under normal use and service for a period of 16 months from date of shipment or 12 months after start up of the system. OUR obligation under this warranty is limited to repairing or furnishing, without charge F.O.B. point of manufacture, a similar part to replace any part(except filter), which was proven to defective within warranty period.

WE will not in any event be held responsible for any indirect or consequential damages.
PHOTOS SHOW FOR our Vacuum Lubricating Oil Purifier:

Equipments Production by Quantity in Factory
Series TYA Vacuum Lubricating Oil Purifier:
Improved TYA Lube Oil Purifier Developed in ZHONGNENG:
PHOTOS SHOW FOR Stainless Steel TYA Lubricant Oil Purifier:
Vacuum Lubricating Oil Purifier Series TYA-500

Whole View

Side View
PHOTOS SHOW FOR Daily Production in our factory:
Optional Choices (Standard Type & Deluxe Type):

◆ European Components Offered & Reasonable Designed & Mature Technology (Deluxe Type)
◆ Highest Cost Performance & Reasonable Designed & High Efficiency (Standard Type)

- Main parts choices:

  - French Schneider Electrical Control
  - Germany Leybold Vacuum Pump
  - Motor
  - Oil pump
Filters

Steel wire hose

Siemens Electrical

PLC Control System

Weather Proof Type

Movable Trailer

Weather proof housing

Dust Proof, Weather proof and mobile type

All above choices are available for you
Optional:

PLC Fully Automatic Control System

View of machine’s final checking and delivery

Alfawest Australia Pty Ltd