



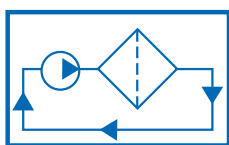
High Vacuum Transformer Oil Purification Systems (HVTOPS) & Dielectric Oil Purification Systems (DOPS)

To achieve optimal dielectric strength and insulating performance inside of transformers and circuit breakers, dielectric oils must be kept absolutely clean and dry.

High Vacuum Transformer Oil Purification Systems can quickly and reliably process transformer oil to meet or exceed very stringent specifications.

By removing all impurities from dielectric insulating oils during substation maintenance or new fill, these systems will improve and optimize:

- **Dielectric Strength to meet or exceed 40 Kva per ASTM D877**
- **Interfacial Tension to meet or exceed 40 dynes/cm per ASTM D971**
- **Power Factor to achieve 0.5% at 25°C or lower**
- **Total Acid Number to achieve .05 mg KOH/gm or lower (when equipped with Fullers Earth option)**



**OIL
FILTRATION
SYSTEMS®**

A CLARK-RELIANCE COMPANY

Two Methods to Quickly and R

Since 1999, Oil Filtration Systems has been designing and manufacturing equipment for the maintenance (dehydration and degassification) of electrical insulating oils. Whether you choose a single-pass High Vacuum Transformer Oil Purification System (HVTOPS), or a multi-pass Dielectric Oil Purifier System (DOPS), you can:

- Remove 100% of free water and 99% of dissolved water to achieve overall moisture content <10 ppm
- Remove all dissolved air & entrained gases to achieve overall content <0.25%
- Remove all carbon and particulate contamination down to 1-micron using high efficiency pleated microglass filter elements rated Beta>1000 per ISO 16889 (absolute)
- Remove acids and surfactants (when necessary) utilizing Fullers Earth or Activated Alumina cartridges

Both types of systems (HVTOPS and DOPS) are available in a variety of process flow rates depending on the application, as follows:

- 5 GPM (1135 LPH)
- 10 GPM (2271 LPH)
- 20 GPM (4542 LPH)
- 30 GPM (6814 LPH)
- 44 GPM (10000 LPH)

Effective for use on:

- Paraffin-based insulating oil
- Naptha-based insulating oil
- Silicone-based insulating oil
- Envirotemp™ FR3™ insulating oil

and Reliably Optimize Your Insulating Oils



10 GPM NEMA 4 High Vacuum Transformer Oil Purification System



20 GPM NEMA 7 High Vacuum Transformer Oil Purification System (Class 1, Div 2)



30 GPM NEMA 4 High Vacuum Transformer Oil Purification System



10 GPM NEMA 4 Dielectric Oil Purification System

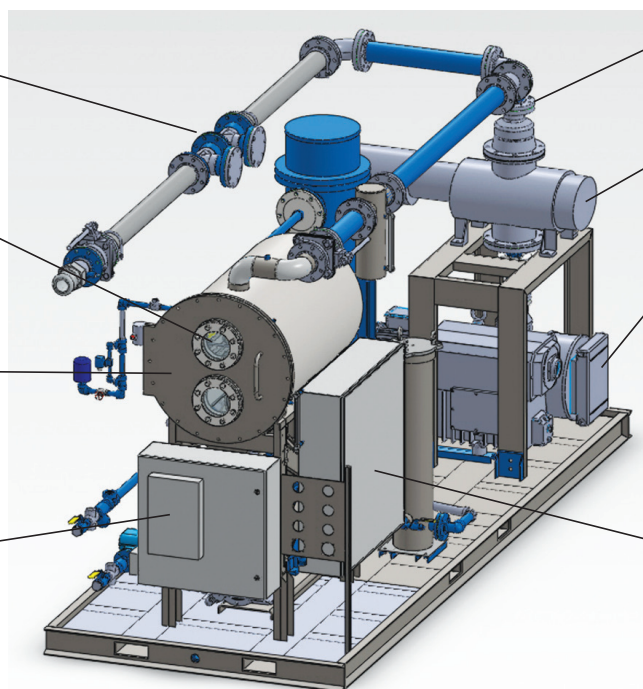
High Vacuum Transformer Oil Purification S

Auxiliary Flanged Ports for "Freeze Trap" to help diagnose and measure removed water and chemicals.

Super Bright LED Tower Light permits easy monitoring of oil level and process inside tower. LED is rated for over 10 years continual use.

Large Capacity Vacuum Tower Loaded with Coalescer Dispersal Elements for maximum surface area and water extraction rates.

NEMA 4 Electric Control Panel with digital temperature controller, digital Torr gauge, and all alarm indicators.



All Flanged or Welded Pipe and Fittings (no threaded connections) for fewer leak paths

Second Stage High CFM Positive Displacement Blower

Primary Stage Rotary Vane Roughing Pump provides greatly reduced DB noise level and vibration versus other systems employing piston type pumps.

- **No external cooling system required for vacuum pump or booster**

NEMA 4 Electric Control Panel with VFD's for both inlet and oil discharge pumps; includes "soft start" for vacuum pump and blower which significantly increases motor life.

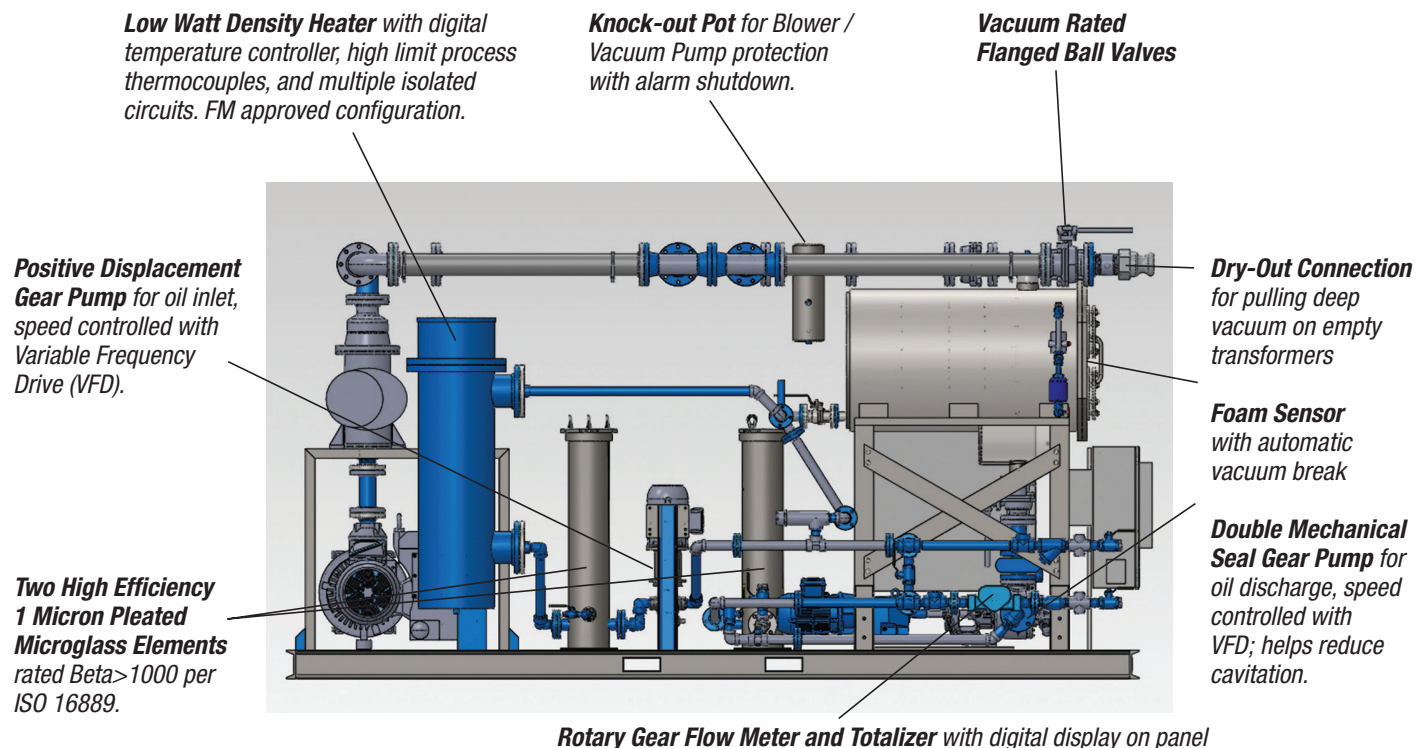
High Vacuum Transformer Oil Purification System (HVTOPS)

- Re-Circulates oil inside of a de-energized transformer or in a tanker truck to remove water, entrained gases, and particulate contamination. A single pass through the system yields 10 ppm or lower water content for quick turnarounds.

- Dries out paper windings by pulling deep vacuum on empty transformers.

Systems are equipped with a 2-stage vacuum pump and blower, operating at 0.5 Torr or lower.

n Systems (HVTOPS)



Standard features for HVTOPS

- Specially designed horizontal vacuum tower loaded with high efficiency dispersal elements for optimal water extraction rates
- Foam sensor with automatic vacuum break
- Inlet pump – positive displacement gear type
- Oil discharge pump – positive displacement gear type with double Viton® Mechanical Seal
- Variable frequency drives – enables operator to effectively dial in the optimal system flow rate
- Low watt density heater with high limit and process thermocouples to safely and effectively raise the oil temperature, along with digital temperature controller
- 2-stage vacuum pump and blower capable of pulling 10^{-4} Torr at dead-head (operating at 0.5 Torr or lower)
- Pre-filter and polishing filter elements (0.5 micron nominally rated, or 2.5 Micron Beta>1000 per ISO 16889)
- NEMA 4 electric control panel with Siemens PLC, pushbutton on-off switches, and alarm indicator lights
- Dry-out connection to pull deep vacuum on empty transformers
- Connection ports for optional Fullers Earth housing
- Bypass valve assembly for internal circulation and oil pre-heating
- Sight flow indicator on inlet and outlet
- Inline digital flow meter and totalizer
- Heavy duty carbon steel skid base with spill containment lip and forklift slots

For options, see back cover.

Dielectric Oil Purifier System (DOPS)



Designed to remove all impurities from dielectric insulating oils in multi-pass.

- Dielectric Strength to meet or exceed 40 Kva per ASTM D877
- Interfacial Tension to meet or exceed 40 dynes/cm per ASTM D971
- Power Factor to achieve 0.5% at 25°C or lower
- Total Acid Number to achieve .05 mg KOH/gm or lower (when equipped with Fullers Earth option)

This system is equipped with a single stage vacuum pump **and no blower**, so it does not have a dry-out port to pull deep vacuum on empty transformers. Otherwise, it has all of the same features and functions as the High Vacuum Transformer Purification System.

Standard features for DOPS

- Specially designed horizontal vacuum tower loaded with high efficiency dispersal elements for optimal water extraction rates
- Foam sensor with automatic vacuum break
- Inlet pump – positive displacement gear type
- Oil discharge pump – positive displacement gear type with double Viton® Mechanical Seal
- Variable frequency drives – enables operator to effectively dial in the optimal system flow rate
- Low watt density heater with high limit and process thermocouples to safely and effectively raise the oil temperature, along with digital temperature controller
- 1-stage vacuum pump operating down to 1 Torr
- Pre-filter and polishing filter elements (0.5 micron nominally rated, or 2.5 Micron Beta>1000 per ISO 16889)
- NEMA 4 electric control panel with Siemens PLC, pushbutton on-off switches, and alarm indicator lights
- Connection ports for optional Fullers Earth housing
- Bypass valve assembly for internal circulation and oil pre-heating
- Sight flow indicator on inlet and outlet
- Inline digital flow meter and totalizer
- Heavy duty carbon steel skid base with spill containment lip and forklift slots

For options, see back cover.

Model Selection Key

HVTOPS - 30VFD - 840X - 33kW - 4PLL - DOMI - DPM - SS - ETM - 150/1800 - 480 - N4 - V - Z

Custom Options:
Z = Custom Equipment (Specified)

Heater Rating:
33kW = 33 kilowatt
66kW = 66 kilowatt
96kW = 96 kilowatt
120kW = 120 kilowatt
180kW = 180 kilowatt

Flow Rate:
5VFD = 5 GPM Variable Flow (1200 L/Hour)
10VFD = 10 GPM Variable Flow (2300 L/Hour)
20VFD = 20 GPM Variable Flow (4600 L/Hour)
30VFD = 30 GPM Variable Flow (6800 L/Hour)
44VFD = 44 GPM Variable Flow (10,000 L/Hour)

***Optional Equipment:**
4PLL = 4-Point Lifting Lugs
DMI = Digital Moisture Indicator
DOMI = Doble Moisture Indicator
DPM = Digital Particle Monitor
SS = Stainless Steel Wetted Components
TM = Trailer Mounted
ETM = Enclosed Trailer Mounted

Electrical Requirement:
208 = 208V / 3Ph / 60Hz
220 = 220V / 3Ph / 50Hz
220V / 3Ph / 60Hz
380 = 380V / 3Ph / 50Hz
400 = 400V / 3Ph / 50Hz
415 = 415V / 3Ph / 50Hz
480 = 480V / 3Ph / 60Hz
575 = 575V / 3Ph / 60Hz

Filtration:
820X = OFS-820X (Series) Cartridge **For 1-5 GPM*
840X = OFS-840X (Series) Cartridge **For 10-44 GPM*

Vacuum/Booster Rating:
70/400 = 70 CFM Roughing Pump / 400 CFM Booster
70/800 = 70 CFM Roughing Pump / 800 CFM Booster
130/1200 = 130 CFM Roughing Pump / 1200 CFM Booster
150/1800 = 150 CFM Roughing Pump / 1800 CFM Booster

Electrical Rating:
N4 = NEMA 4
N7 = NEMA 7
Explosion Proof

High Vacuum Transformer Oil Purification System

Seal Material:
V = Viton
B = Buna N

Rental Fleet of Systems Available for Quick Shipment

Oil Filtration Systems keeps a rental fleet of transformer oil purification units ready for emergency mobilization anywhere in the world. Our experienced field service technicians can either walk you through easy start-up procedures over the phone or accompany the system to your jobsite to help with start-up, commissioning, and training.



30 GPM HVTOPS



Employs High Efficiency Filter Elements

Oil Filtration Systems manufactures its own high-efficiency filter elements for particulate removal from all mineral-based and synthetic hydraulic, lubrication, dielectric, and fuel oils. OFS elements are constructed of the highest quality micro-fibrous glass filtration medias utilizing serial filtration technology, and the medias are layered to achieve optimal performance characteristics. OFS elements are suitable for use in the most demanding applications, and they are designed and tested to provide the highest level of efficiency with the maximum dirt holding capacity. All OFS filter elements have particulate removal efficiencies of Beta(c)>1000 (99.9% for the stated micron size), which is based on ISO 16889-1999 testing standards. They are available in a wide range of micron sizes to suit virtually any application (2.5, 5, 7, 12, and 22-Micron).

Optional features for both HVTOPS and DOPS

- Inline digital moisture indicator (Doble Domino®)
- Fullers Earth Housing Assembly
- All analog controls (relays and contactors)
- Enclosed trailer with rear and side access doors
- Fully customized tractor trailer rig with lab room, space heater, and /or air conditioner
- Onboard diesel powered generator for independent operation
- Hose reels on inlet and outlet
- NEMA 7 explosion proof (Class 1, Division 2, Groups B, C & D)
- Connection ports for optional freeze trap



111 Parkway Drive
Boerne, Texas 78006
Toll Free (800) 449-0262
(830) 816-3332
Fax: (830) 816-3331

www.oilfiltrationsystems.com

