

DOUBLE STAGE ULTRA HIGH VACUUM TRANSFORMER OIL PURIFICATION SYSTEM OF 1000 GALLONS FLOW RATE PER HOUR



Transformer Oil

The principal function of Transformer oil is to provide Electrical Insulation and to cool transformer winding by absorbing the heat generated during operation and conducting it to the exterior surface. Some electrical apparatus requires insulating oil of a superior quality in respect to freedom from contamination in order to insure high dielectric strength and a long time service under extreme stresses.

There are many types of contamination, such as water, solid particles of dust, metals, colloidal carbon, products of corrosion, acids, resins, gums, tar, sludge, organic contaminants and solvent, air and gas which adversely affect the insulating properties of oil. Contamination enters oil in many ways. Some occurs in various phases of oil transfer from the refinery to the point of use. Some enter through breather vents or in case of seal transformers during the process of filling or overhaul. Some residual moisture and contamination can be found even in new transformers.

It is known fact that water and air are always present in oil in soluble form. Water in its free phase may be present either dispersed in form of emulsion or settled at the bottom of the reservoir. Contaminants and products of oil deterioration reduce dielectric strength, resistivity and loss factor of oil by forming a path of low resistance for electric discharge through the oil. Protection of electrical apparatus by continuous or frequent purification of insulating oils will eliminate costly breakdowns and assure a safe and dependable operation. A preventive maintenance cost is usually less than the cost of repair and in addition helps to keep the equipment at its best efficiency.

Double Stage Ultra High Vacuum Transformer Oil Purification System

For achieving the desired results, the Oil Filtration Plant is designed for Ultra High Vacuum and Low temperature of oil as high temperature can result in thermo-oxidative degradation of oil. The Ultra High Vacuum Double Stage type oil treatment plant is ideal for treating new/ used Insulating oil of high voltage and super high voltage transformers.

Dehydration & Degasification

The machine is equipped with a 2-stage vacuum pump (High Vacuum Pump and Booster Pump) operating down to 0.5 Torr vacuum. For effectively removing of dissolved gases and moisture content from the oil under High vacuum, the rasching rings provided will be sufficient to form a thin film of oil and will facilitate easy removal of dissolved gases and moisture at the rated flow of oil. Other gasses in solution with oil, including combustibles, are also removed.

Excessive moisture content in oil makes the insulation materials age more quickly and reduces their dielectric strength. In general, the mechanical life of insulation is reduced by half every time that the water content is doubled. The rate of thermal deterioration of the paper is proportional to its water content. Water in mineral oil transformers creates the risk of bubble formation, when desorption of water from the cellulose increases the local concentration of gases in the oil. Accurate moisture measurements can also provide warning of leaks in the oil systems, as the water is absorbed.

Low Oil Temperature

It also has a multi-circuit, digitally controlled oil circulation heater for high heating capacity and optimal water/gas removal efficiencies. At minimum oil temperature of 60-65 Deg. C this system is designed to efficiently remove dissolved moisture and gases from Transformer Insulating oil down to 10 PPM or lower. Heaters are provided in protection tubes to avoid overheating, hot spot and breaking of oil.

Filtration / Particulate Matter

The plant has a 3-stage filtration system that comprises of a pre-filter/Magnetic Strainer: It is provided to retaining all particles above 1 mm size and also magnetic particles. Press Filters: The Press filter will consist of Filter Papers held between aluminum casting discs and it will be suitable for removal of particles above 20 Micron size. Fine Cartridge Filter: The high-efficiency pleated micro glass cartridge filter elements will remove particulate contamination down to 1 micron.

Transformer Evacuation System

In addition the plant has inbuilt transformer evacuation system, it can pull high vacuum on empty transformers to remove moisture from the paper windings.