



Oil purification systems

Switzerland 

Oil Treatment Plants

Oil Regeneration Plants

Vacuum Pump Systems

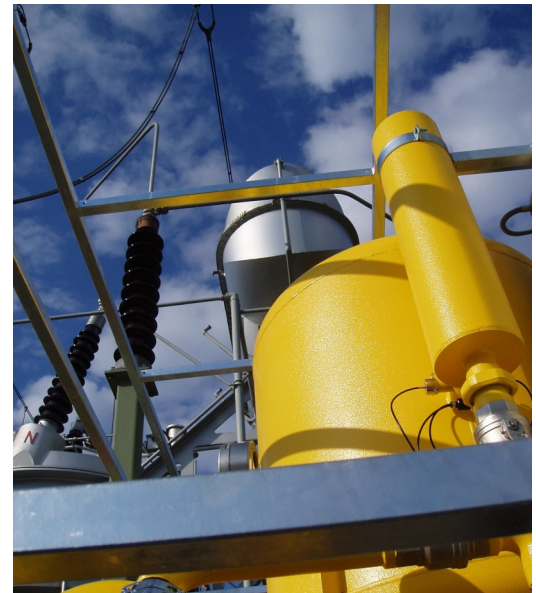
Service, Support & Maintenance

Inspection & Training

MICAFLUID AG — DRIVEN BY SWISS TECHNOLOGY SINCE 1913

www.micafluid.com

Oil Treatment



Micafluid's Swiss technology used for the conditioning and purification of insulating oil has been widely used globally over the past century since 1913 and has offered excellent service and results for its respective customers.

This vast experience over the past decades makes us the ideal partner for service and maintenance companies. Through research and development we ensure that our machines remain on the cutting edge and on par with the latest industrial standards and protocols.

As part of the transformer lifecycle management, regular servicing is essential. Micafluid is fully aware of the customer's need to reduce the TOC (Total Owning Cost) thus our equipment has been designed to meet this challenge, thereby boosting performance.

All our oil treatment plants type **VOP (variable oil purification)**, with variable flow control, are designed for the economical conditioning and drying of insulating oils using vacuum and micro pore filtration technology. This can be done safely over one pass or several passes for a variety of different insulation oils, depending on the customer's requirements. Furthermore our units are PLC controlled, integrating **fully automatic functions** suitable for **off-line** (de-energized transformer) as well as **on-line** (energized transformer) filling, purification and filtration processes.



Expectations when treating insulating oil

- Low moisture content at plant outlet
- Low gas/air content at plant outlet
- Elimination of residual gas from the insulation
- Drying of transformer insulation
- Easy and safe operation
- On-line measuring and recording of process parameters
- Flexibility in application - various oil types and oil volumes

Oil Regeneration



The only effective treatment for improving the dielectric properties of aged oils is the regeneration with Fuller's Earth. The activated Fuller's Earth, has the property to adsorb Carbonyl - and Hydroxyl - groups in oil, as well as small amounts of moisture. The degree of moisture adsorption is insufficient to guarantee effective drying; however, treatment of the oil with Fuller's Earth, combined with vacuum drying, yields excellent results. The unit consists of one or several adsorption columns, a filter housing and eventually an inhibition set.

Such a compact and mobile installation encompasses a combination of a two-stage oil conditioning set with an oil treatment plant type **VOP** and an oil regeneration unit type **CRP3000**.

Regeneration unit types **CRP3000** are generally connected in series with a separate drying and degassing oil treatment plant type **VOP**.



Benefits & Applications

- Reconditioning of aged insulating oil
- Removal of acidity
- Improvement of dissipation factor tan delta
- Improvement of oil colour

Having extensive knowledge in all aspects related to vacuum processes, electrical insulation and high voltage equipment, Micafluid AG is in pole position to assist users of oil reconditioning, regeneration units and processes.

Different types of Oil Treatment Plants & Vacuum Pump Systems



Standard Oil Treatment Plants

VOP010	300 - 1'000 lt/h
VOP030	1'000 - 3'000 lt/h
VOP060	2'000 - 6'000 lt/h
VOP090	3'000 - 9'000 lt/h

High-capacity Oil Treatment Plants

VOP120	4'000 - 12'000 lt/h
VOP160	6'000 - 16'000 lt/h
VOP200	8'000 - 20'000 lt/h
VOP300	10'000 - 30'000 lt/h

Double Stage Vacuum Pump Systems

VPU900	900 m ³ /h
VPU1000	1'000 m ³ /h
VPU2000	2'000 m ³ /h
VPS2500	2'500 m ³ /h

Oil Filtration Units

OFP010	300 - 1'000 t/h
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Customized machines and units are available on request.



Service, Support Maintenance Inspection & Training



Service and Maintenance

Oil treatment plants as well as vacuum pump units or regeneration units which require maintenance are completely repaired and tested by our service specialists. A detailed service protocol indicates the state of the unit at arrival, performed work and testing as well as new guaranteed performance after revision / refurbishment.

Inspection & Training

During training and commissioning, our process - engineers perform training for the operators at our workshop in Zurich.

This can also be done at customer's facilities on-site. The operators are trained in the concepts around "best practice", process control, operation and maintenance. If malfunctions or interruptions of the operation occur, are our engineers available 24hrs a day to assist the operators on-site.

MVA - Machine Virtual Assistance

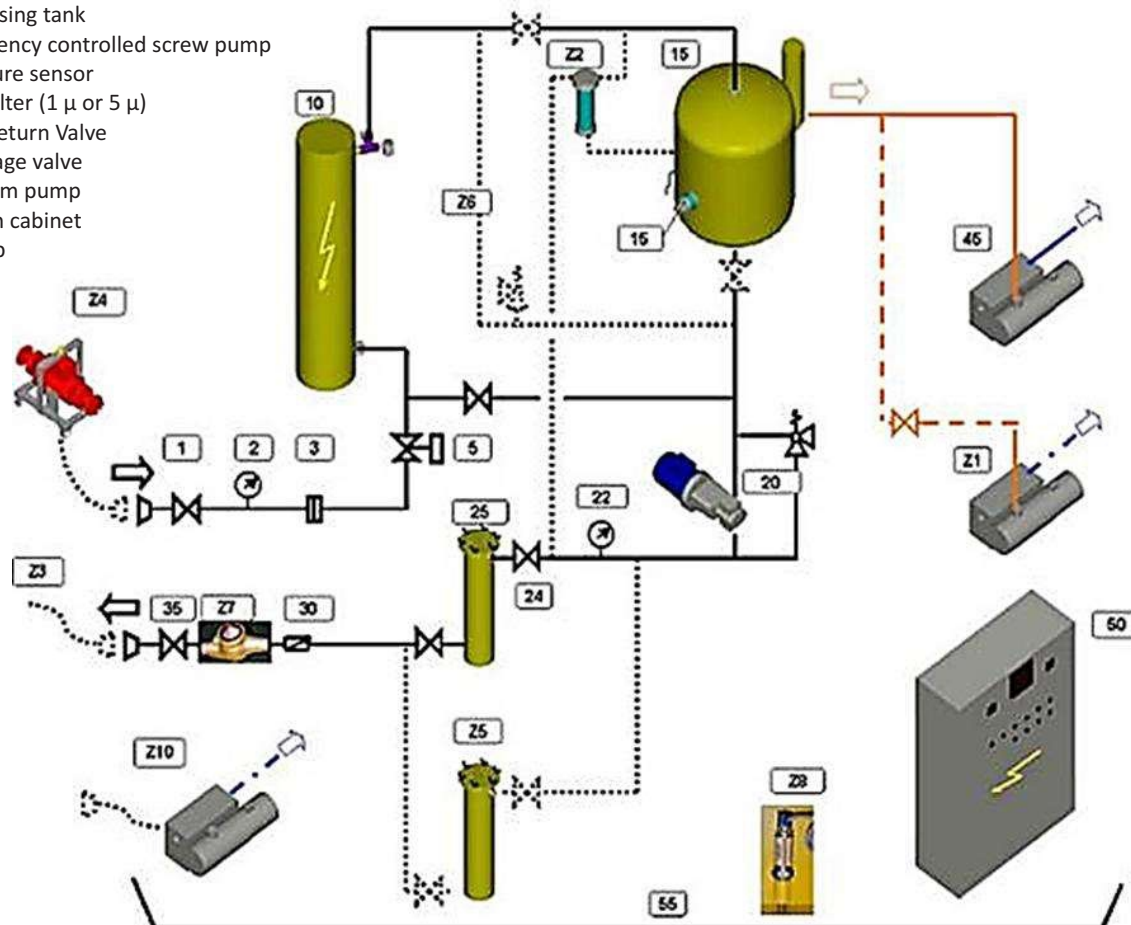
Is an internet based support platform and allows to support our customers directly through direct remote machine access. The MVA Support Platform also allows the customer direct remote process supervision as well as remote alarming through several communication protocols.



Substantial Plant Characteristics



- 1. Inlet valve
- 2. Pressure sensor
- 3. Coarse filter
- 5. Solenoid valve
- 10. Electrical heating
- 15. Degassing tank
- 20. Frequency controlled screw pump
- 22. Pressure sensor
- 25. Fine filter (1 μ or 5 μ)
- 30. Non-return Valve
- 35. Drainage valve
- 45. Vacuum pump
- 50. Switch cabinet
- 55. Oil tub



Substantial Plant Characteristics



Oil Heating

The oil to be treated is heated by means of an electrically driven, PID - controlled oil heater, which is brought to the required treating temperature. The heating elements are placed into welded-in protection tubes, physically separated from the oil.

The horizontal position and generously dimensioned heating surface allow a careful heating of the oil.

Online Oil Measuring

A new measuring instrument for the determination of the oil quality at the in/outlet of the plant guarantees an optimal duration of treatment. The data are continuously registered.

Degassing System

The degassing system has been optimised and expanded with an automatic froth control. New is also the automatic level control, which depends on the adjusted flow rates.

Excellent degassing values and superior oil quality are guaranteed.

Filtration

A built-in prefilter at the inlet of the VOP - plant protects the plant against coarse contamination.

Fine filter cartridges provide an automatic control of the pollution level.

The filter elements are made of special synthetic material and are non-hygroscopic.

Oil Feeding

Conveying of oil in the degassing phase is carried out by means of differential pressure. A frequency controlled feeding pump allows for variable oil flow-throughs. A specially developed automatic screen guarantees an even oil flow-through in the degassing phase. A photoelectric level surveillance controls the maximum admissible oil level in the degassing tank.

Vacuum Plant

For the evacuation of gasses, as developed for the design of the degassing tank, only rotary slide vane vacuum pumps are now used. To achieve lower guarantee values, only the suction capacity of the vacuum pump is increased.



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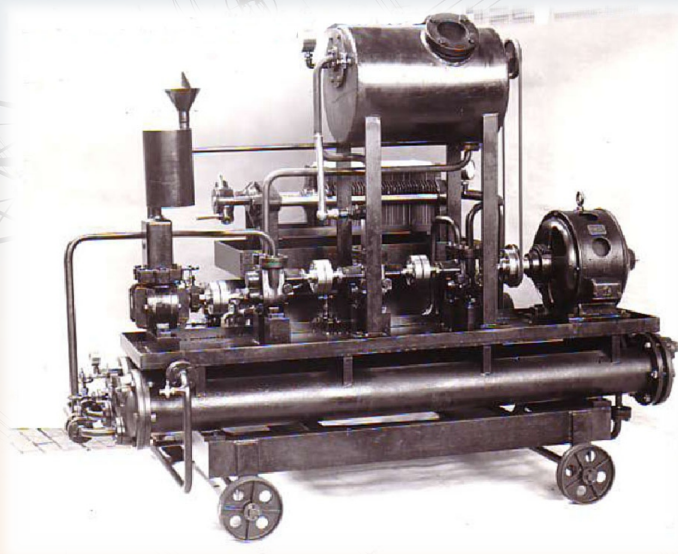
Mobile oil purification plant leaving the Micafil AG premises in Zürich—Altstetten around 1930



Micafluid AG is the leading manufacturer of oil purification systems and provides a vital contribution to maximum quality of your insulating fluids.

In the course of the restructuration of the vacuum plants division of ABB Switzerland AG, Micafil, the newly formed company Micafluid AG took over the entire product line of oil purification plants in 2006 under a mutual agreement. Since all rights and technology were transferred as well, Micafluid takes advantage from a research and development background of 95 years, on which Micafil AG had based their strong reputation.

First Micafil AG oil purification plant in 1913



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