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Contracting Est.



Oil Purification Plant

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Hussain Ali Hussain Contracting Est.



Overview:

HAH Est. is one of the leading service providers of the oil treatment plant in the kingdom. We offer rental services of well maintained transformer oil filtration plant for filtration of transformer (EOK 6000 Oil treatment Plant) of various sizes & capacities.

We have well known machine of international brand (Herring). The EOK 6000 Oil treatment plant has throughput capacity of 6000 l/h. EOK 6000 can work at different capacities which can be regulated automatically.

The emphasis in oil treatment is always on the user requirements and thus all it's functions are tailored to suit the customer specifications. This plant can carry out the following operations:

- Removal of Suspended Particles by Filtering
- Gassing & Degassing
- Flushing and cleaning of transformers

This plant can be operated in the manual mode, semi-automatic or automatic mode and is equipped with the latest measuring and control instruments. Vacuum oil treatment systems are available in a stationary version, in a moveable version or in a fully mobile version on one or two axle trailers licensed for the public traffic.

With our expertise in the market, we aim to provide our customers prompt delivery along with added advantage of skilled & highly qualified operators that can work according to the needs of our customers. Along-with operating of machine, our skilled technicians can also assist in providing the following services:

- Oil breakdown Voltage testing
- Water Contents Level testing
- Inspecting leakage of transformers & rectifying it

The insulation oil treated with this system complies fully with key industry standards such as VDE 0370 or ASTM guaranteeing high quality standards of services & this has been proved very good for oil treatment of power transformers ranging from 10 MVA to 700 MVA.

We also have other machines such as DILO SF6 gas carts, DILO SF6 vacuum pumps for gas handling, oil storage tanks & another Oil Purification plants (Manufactured by Zhongneng) in our range of equipments.



A. Technical Data Sheet

Vacuum Oil Purification Plant EOK 6.000

Performance Data: (20°C, 50 ppm water, 10 % gas content inlet, with complete vacuum equipment)			
After one Passing	Water content	<5	ppm
	Gas content	<0,1	Vol%
	Breakdown voltage	>65	KV/2,5mm
After several Passing	Water content	<4	Ppm
	Gas content	<0,1	Vol%
	Breakdown voltage	>70	KV/2,5mm

Main Characteristics			
Electric flow heater	Heating Capacity	78 / 90 *)	kW
	Heating Groups	4	
	Temperature Range	20-100	°C
	Temperature Increase	25	°C
Oil Pump OP1 SIHI	Capacity	6000	l/h
	Pumping head pressure	4	Bar
Vacuum Pump VP1 LEYBOLD	Capacity	300	m ³ /h
	Ultimate pressure	0,08	Mbar
Cartridge Filter	Mesh size	1	µm
Control Console	Power Rating	97 / 110 *)	kW
	Nominal Voltage	380	V
	Frequency	60	Hz
	Power coefficient	0,9	

Options			
Oil Pump OP2 SIHI	Capacity	6000	l/h
	Pumping head pressure	4	Bar
Vacuum Pump VP2 LEYBOLD	Capacity	300	m ³ /h
	Ultimate pressure	0,08	Mbar
Roots Pump LEYBOLD	Capacity	1000	m ³ /h
	Ultimate pressure	0,008	mbar

Measurements			
	L / B / H	3300 / 2100 /2300	mm
	Weight	3200	Kg
Connections			
	Oil Inlet / Outlet	1 ½	"
	Vacuum	1 ½ *)	"



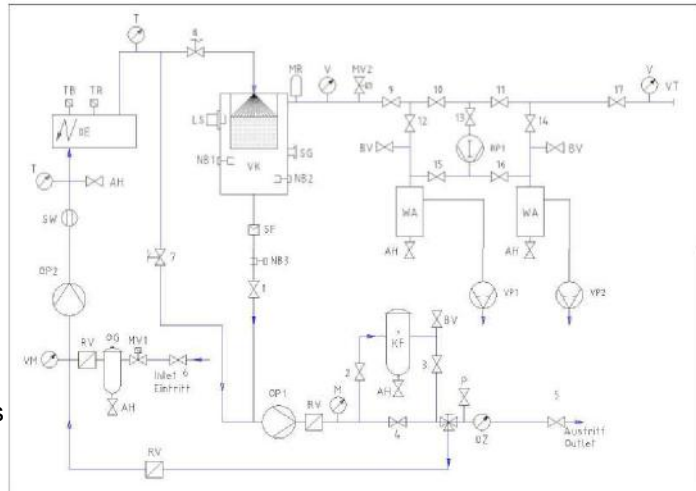
B. Plant Layout EOK-P for professional usage

According our Flow diagram **531-2044-3**

This plant includes all features of the Standard Plant EOK-S. Added to that we have already included some useful additional features which we have offered separately in the past. Therefore we have it preconfigured in this version. The high customer satisfaction and acceptance made us to develop this plant as a separate version. Our focus was the absolute flexibility and time reduction of purifying process. So it is able to do purifying under any circumstances that may occur. Especially our big customer like Siemens and other use this type when several new transformers has to be in-stalled and where time saving with best results is the most critical part.

Also professional maintenance companies and departments for maintenance of utility and transformer companies often use this kind of plant.

For example, with the added options like the valve solution you are able to split the vacuum power between plant and transformer so you can keep the transformer under vacuum while treatment without needing an extra vacuum system. This is often part of maintenance specification. Also you can use the full vacuum power for treatment.



Second Vacuum pump for transformer evacuation (VP2)

This one stage rotary vane pump with gas ballast device and air-cooled motor is installed in order to evacuate the transformer. At the outlet of the pump is a condenser installed in order to obtain the water during drying process of transformer. In the vacuum line a water condenser with drain valve is installed. For pressure indication a vacuum gauge is provided.

Roots Pump (RP)

This pump is installed before the vacuum pumps VP1 and VP2 in order to get a higher vacuum in the degassing tank and get better and faster drying results.

In the vacuum line a water condenser with drain off valve is installed. For pressure identification a pirani vacuum gauge is provided.



Valve Solutions for Vacuum Pumps

With these valve solutions you will have the following driving modes:

- Driving one rotary vane pump VP1 for degassing at plant and evacuating transformer by one rotary vane pump VP2 and roots pump
- Driving one rotary vane pumps VP1 and roots pump RP for degassing at plant and evacuating transformer by one rotary vane pump VP2
- Driving two rotary vane pumps VP1, VP2 and roots pump RP for evacuating transformer
Driving two rotary vane pumps VP1, VP2 and roots pump RP for oil degassing

Oil Pump OP2

This pump transfers the oil from outside the plant through the oil heater in the degassing tank or directly to the outlet of the plant.

The oil pump is side channel type made by SIHI.

If oil is pumped through the bypassing pipe to this pump, it sucks correspondingly less oil from the outside of the plant.

This oil pump is needed, if transformer is evacuated during oil purifying.

Pirani Gauge for Vacuum

A special vacuum measuring device called "pirani gauge" will be delivered in order to measure the low vacuum till $5 \cdot 10^{-4}$ mbar. The measurement will be shown on a digital scale on the control console. This device can be installed in order to measure vacuum in degassing tank of plant or in vacuum line in order to measure transformer vacuum.

Fine Filter increase

In this plant we have increased the volume of the filter element in order to gain a longer endurance with the same filter mesh.

Measuring Devices

- Oil inlet temperature
- Oil temperature after heating
- Oil inlet pressure
- Oil outlet pressure
- Degassing vessel pressure
- Oil flow
- Vacuum



C. Additional Equipment for Plants EOK-B; EOK-S; EOK-P

Hoses for oil and vacuum

For oil special flexible reinforce **rubber** hoses and for vacuum special flexible **stainless** steel hoses will be delivered. Other lengths could be delivered at request.

- 2 oil hoses each 30 m
- 4 oil hoses each 10m
- 1 vacuum hose 10 m

Moisture Measuring Device (FM) with 2 Sensors

With moisture sensor. The sensor and the display will be installed in the plant and the measuring is real time. The measuring range for moisture is between 0ppm and 300ppm. One sensor will be installed in oil inlet line and one in out let line. The operator will see that the oil out flow and inlet conditions of oil. o

Analog Oil counter

An analog oil counter will be installed on the plant and will show the oil quantity.

Devises for Energised Transformer/ "Transformer On Load/Online"

Following devises will be useful in order to work at energised transformers

- Evacuation devise for oil hoses and plant
- External signal will shut down the plant and will close in and outlet valves
- Oil sensor will recognise oil leakage at plant and will shut down the plant and close in and outlet valves

Second Fine Filter and Outlet Valves

- A second cartridge filter consists of a mild steel-housing with hinged lid will be installed in parallel to the first one.. In the filter housing a separation wall is built in. To this wall the candle filter is mounted. Oil samples can be taken by using the sample taker valve p. The filter mesh of the candle is 1 μ m. The filter can be changed during purifying by valve solution. In this case first filter will be bypassed and second will be in line with oil flow.



G. Documentation

At delivery of the plant 2 sets of machine documentation are supplied. The documentation is in English and consists of:

- Operation manual
- Electrical wiring diagram
- Service and maintenance manual
- Spare part list/consumable list

H. Assembly and Start-up

The machine and the additional equipment is completely assembled, tested and checked from Hering AG staff. A checklist with the operation data, a part list for completeness and shipping list with the final weights and sizes are provided at delivery. The oil purification plant is ready for operation at customer's site when connected to the power and oil lines, respectively vacuum lines.

I. Performance and Workmanship

The oil purification plant is designed, manufactured and assembled according to DIN, VDE and the German safety standards. All sizes are metric, labelling and indication of process values apply to the SI-Unit system.

K. Acceptance

Before delivery the machine is exposed to an internal acceptance test over 36 hours. In this acceptance test the following data of this specification are demonstrated:-

- Visual control of all screwing and armatures during operation.
- Control of oil quality passing per hour, oil temperature and vacuum
- Control of function float valves, float switch, vacuum meter, manometer as well as indication instruments on switch board.
- Control of faultless of mechanical and electric erection and density.
- An acceptance test protocol is provided