Globecore GmbH

ISO 9001-2000 CERTIFIED COMPANY

# *TRANSFORMER OIL HIGH VACUUM DEGASSING AND PURIFICATION PLANT CMM-6.0*

## *6000 l/h*

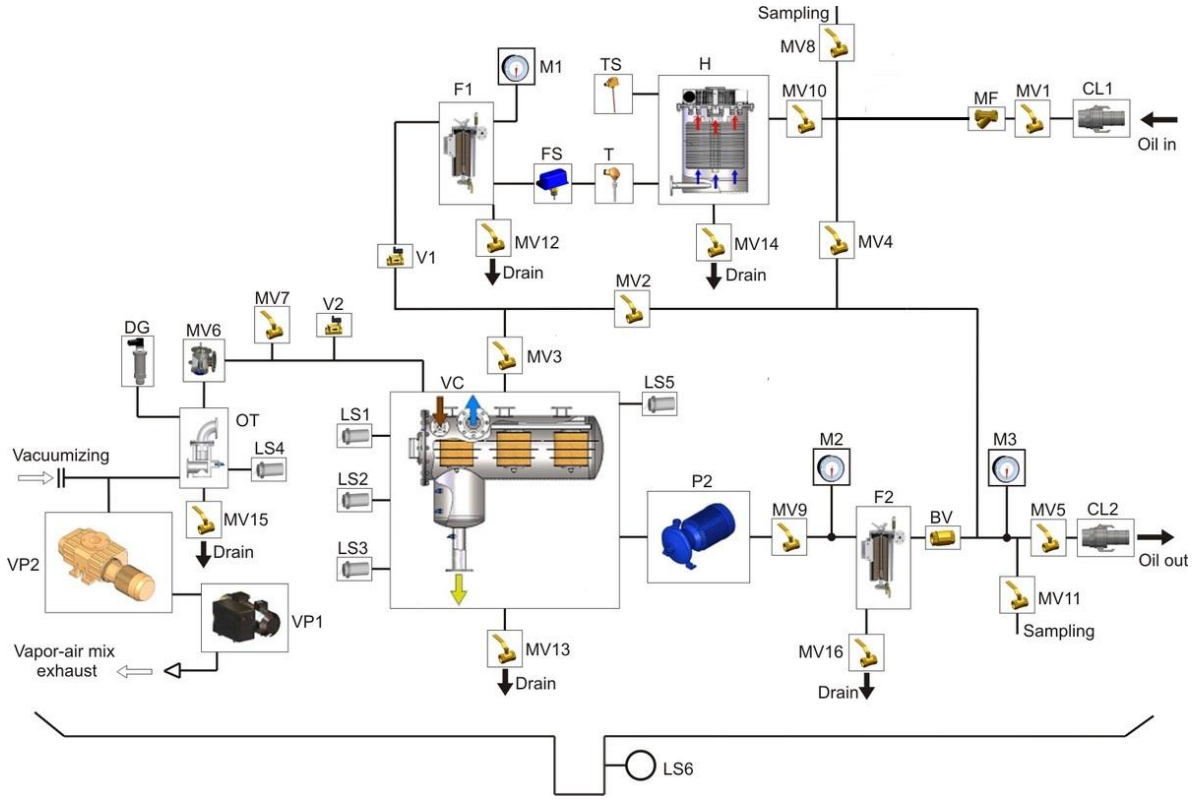
***as option the plant can be mounted on roadworthy trailer***

| Oil parameter | Unit | Test method | Before treatment | After treatment |
|---|---|---|---|---|
| Dissolved Gas Content | % | **ASTM D-2945-71** | **12%** | **0,1 %** |
| Water content | ppm | **ASTM D-1744-64** | **100** | **5** |
| Dielectric strenght | kV | **IEC 60156** | **≤ 20 kV** | **≥70 kV** |

**** AVERAGE TRANSFORMER OIL PARAMETERS ACHIEVED WITH THE PLANT***

## *TECHNICAL PARAMETERS*

| *№* | *ITEM* | *VALUE* |
|---|---|---|
| **1** | Capacity , l/h | **6000** |
| **2** | Oil temperature, max, $C^0$ | **85** |
| **3** | Pressure of oil in the outlet, bar | **2,5** |
| **4** | Head of oil delivery related to outlet of the plant, m | **35** |
| **5** | Oil heater capacity, kW | **100** |
| **6** | Set power consumption, kW | **115** |
| **7** | Supply voltage, 3 phase, AC, 50 Hz, V | **380** |
| **8** | Dimensions, mm<br>- length<br>- width<br>- height | **1750**<br>**1300**<br>**1650** |
| **9** | Weight, kg | **1200** |




***VC –*** *vacuum chamber;*
***P2 –*** *oil pump;*
***MV1 – MV5 , MV7– MV16 –*** *ball valves;*
***MV6 –*** *vacuum valve,*
***H –*** *oil heater;*
***BV –*** *return valve;*
***F1, F2 –*** *filters;*
***M1, M2 , M3 –*** *pressure-gauges;*
***T –*** *sensor of temperature regulator;*
***TS –*** *thermostat;*
***FS –*** *flow relay;*
***V1 – V2 –*** *solenoid valves;*
***DG –*** *vacuum sensor;*
***LS1 – LS3, LS5 –*** *oil level sensors;*
***VP1, VP2 –*** *vacuum pumps;*
***LS4 –*** *foam formation detector;*
***LS6 –*** *leakage detector;*
***MF –*** *mesh filter;*
***OT –*** *trap;*
***CL1 – CL2 –*** *quick-couplings*

## Oil transfer

***Oil pump***

Centrifugal pump
Capacity without working load: 7 $m^3/h$

## Oil filtration

***Mesh filter*** 200 µm, brass gauze, basket type

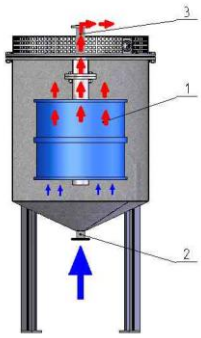
***Filters 2 pcs.*** In welded design, vacuum and pressure-tight, complete with all necessary valves, cover and easily exchangeable filter element:
Filtration fineness:
1) 5 µm
2) 1 µm
The filter element has a graded depth function, this in order that the coarse particles are retained in the outer layers and the finer particles only in the deeper filter layers.

***Pressure gauges*** Installed for checking filter resistance, respectively the degree of contamination of the filters. Measuring range 0 – 1 MPa

## Oil heating

***Oil heater***

Oil heater is housing with installed inside inlet and outlet pipe lines, drain valve. Heater operation is fulfilled from control panel, each section is operated apart.




***1 -*** heating block
***2*** – cold oil inlet nozzle
***3*** – heated oil outlet nozzle

***Heating power (max)*** 100 kW

## Vacuum system

***Preevacuation vacuum pump + Roots vacuum pump***

Suction rate: 120 $m^3/h$
Ultimate pressure: 0.5 mbar

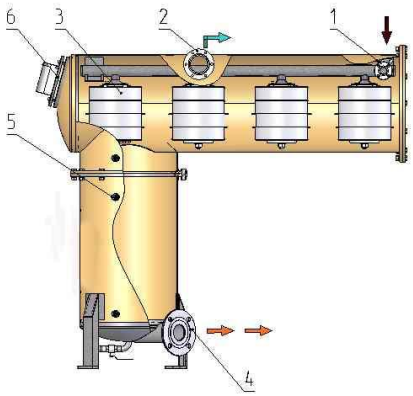
Suction rate: 1000 $m^3/h$
Ultimate pressure:0,01 mbar

***Ultimate vacuum pressure when oil treatment*** ≈ 1 mbar Depends on gas content in initial oil

***Vacuum chambe***

In welded design. Oil distributors are mounted in the upper part of the chamber. Outside air is fed to the drier via moisture separator and valve. The vacuum value in the chamber is controlled by ball valve and vacuum gauge. Equipped with moisture separator (vacuum trap). Illuminated sight glasses are mined for process observation.

*1 – inlet nozzle*
*2 – vacuum system connection nozzle*
*3 – activating filter*
*4 – oil outlet nozzle*
*5 – level indication*
*6 – sight glass*



| | |
|---|---|
| ***Receiver*** | - Receiver is meant for capture of gases and humidity when degassing. Receiver consists of housing in welded design, vacuum chamber and vacuum pumps branches. There is also branch for off-site vacuum demand and air valve. |
| ***Vacuum gauge*** | - Control of ultimate vacuum in vacuum chamber is executed by digital vacuum gauge |
| ***Control cabinet*** | |
| ***Edition*** | In steel enclosure. Containing all electrical apparatuses, contactors, thermo-relays, fuses, control buttons and switches. |
| ***Control devices*** | |
| ***Thermistor*** | Oil heater cutoff when oil temperature exceed *90ºC* |
| ***Flow Switch*** | Oil heater cutoff when no oil flow. |
| ***Oil temperature controller*** | Oil temperature controller is interlocked with electric heating elements to maintain pre-set oil temperature. Oil temperature is maintained automatically. The digital oil temperature controller is adjustable to set desired oil temperature. |
| ***Oil level sensor*** | Control of oil level in vacuum chamber |
| ***Oil low level sensor*** | Interlocked with discharge pump to prevent low oil level by switching the pump off |
| ***Oil high level sensor*** | Interlocked with oil inlet pump to prevent overflow by switching the pump off |
| ***Foam detector*** | Activated when excessive foam formation |
| ***Solenoid valve*** | Release vacuum when foam formation. Valve is interlocked with foam detector to cut off oil inlet pump when excessive foam formation |
| ***Housing and pipe lines*** | |
| ***Disc shutter*** | Disc shutter with plain lug.<br>Housing material: cast iron GG25<br>Shutter material: stainless steel 316 |
| ***Ball valves*** | Full-bore, flange valve<br>Housing material: cast iron<br>Ball material: stainless steel 304<br>Handle material: chrome-plated cast iron |
| ***Vacuum silphon valve*** | Vacuum silphon valve<br>Housing material: brass |
| ***Vacuum valve*** | Housing material : steel<br>Gasket: vacuum and oil tight rubber, type 9024 |
| ***Non-return valve*** | Prevents the oil from flowing back into the plant, when the feeding pump is switched off; Housing material : steel |
| ***Valves and shutters*** | |
| ***Container*** | Robust container in welded design is meant for placing of equipment and component parts of installation. Container has all necessary doors and service flaps, illuminated inside. |
| ***Pipe lines*** | All component parts are connected by steel pipe lines. Pipes are connected by flange joint. |
| ***Painting*** | The external surfaces of the plant are primer painted 2 coats. After primer painting are finished in two coats. |

***The manufacturer undertakes constant effort to improve functionality of the product. Alterations may be made to parts, units and assemblies of this product. These alterations do not affect the product's functionality and performance adversely in any way.***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