

# HVD – High Vacuum Degasifier series

Contamination of electrical transformers with solids, liquids and gases during manufacture and operation is unavoidable. Techniques for minimizing the degree of contamination are continually sought by manufacturers and asset owners to increase the lifetime of these expensive electrical components. Management of this “primary” contamination is crucial to reduce the buildup of “secondary” contaminants which are destructive to the transformer and result in decreased component lifetime as the asset is slowly dissolved from the inside.

pressure. A magnetic strainer typically removes coarse particles prior to the heating stage. After heating the oil is pumped through a filter to remove particles larger than 20 microns. This is the first stage required to remove the solid contamination. The filtered oil is fed into a vacuum chamber where, due to the reduced pressure above the liquid, dissolved water is vaporised. The reduced pressure also facilitates the removal of any entrained gases in the oil. These are evacuated through the vacuum pump exhaust.



The HVD series of degasifiers uses the only known method for reducing all three primary contaminants by treating the transformer’s oil; the thermo-vacuum process.



Transformer oil is drawn in to the degasifier by means of low pressure created either by an inlet pump or a vacuum pump or combination of both. The oil is heated to reduce its viscosity and allow it flow through the rest of the system at a lower

Various methods are employed to increase the efficiency of the vacuum stage; these typically involve increasing the residency time of the oil in the vacuum chamber or make use of coalescing elements or combine these techniques. The final stage of treatment is to filter the dehydrated and degassed oil through a fine filter that will reduce the residual particle size to less than 1 – 2 microns.

## Typical specification

- Water removal down to 3 PPM or less
- Particulate removal to less than 1µ
- Gas content to less than 0.1%

Achievement of these parameters typically results in an oil BDV of 70 kV or higher and will yield an oil appearance that is sparkling.

The addition of a Fullers Earth module to the HVD series, either disposable or regenerable, will improve other oil parameters and in most cases restore the oil to an as new condition, as illustrated below:-

- Oil colour to better than L=0.5
- Acidity to better than 0.03 mg KOH/g oil
- IFT to better than 40 dyne/cm

Model	150	300	600	1200	2400	2700	3000	3600	4000
USGPH	150	300	600	1200	2400	2700	3000	3600	4000
Imperial GPH	125	250	500	1000	2000	2250	2500	3000	3325
LPH	500	1000	2000	4000	8000	9000	10000	12000	15000
Heater kW	9	16	32	64	128	144	160	196	212
Inlet size	¾"	1"	1½"	1½"	2"	2"	2½"	3"	3"
Outlet size	¾"	¾"	¾"	1"	2"	2"	2"	2"	2"
Vacuum size	1"	2"	2"	3"	4"	4"	4"	6"	6"
Length	80"	100"	100"	180"	180"	180"	220"	220"	220"
Width	60"	60"	60"	72"	72"	72"	72"	72"	72"
Height	78"	86"	86"	100"	100"	100"	100"	100"	100"
Weight (lbs)	1500	2800	3500	8000	9000	9000	10000	11000	11000

The range lends itself to customisation including:

- Mechanical vacuum pumps can be rotary vane or rotary piston
- Vacuum performance can be enhanced through use of a Roots booster
- Oil pumps can be centrifugal or positive displacement
- Gauging can be digital or analogue
- System can be skid-mounted or fitted inside a trailer

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