HY-PRO

VAC-U-DRY

VACUUM DEHYDRATION SKIDS

- Remove Free & Dissolved Water down to 20 PPM (0.002%)
- Remove Free & Dissolved gasses
- Standard Flow range 5~60 gpm,19~225 lpm (larger units available)
- Visually Monitor Fluid and Process through Clear Chamber Covers
- High Water Removal Efficiency
- Adjustable vacuum setting valve
- High Efficiency Particulate Filtration
- Low Watt Density Heaters
- Dimensional and Arrangement Design Flexibility
- Condensate Water Holding Tank with Automatic Drain Standard for 24 x 7 unattended operation
- Electrical Phase Reversal Standard
- Available PLC or VFD Control

VAC-U-DRY optimizes the balance between heat, vacuum and process design to rapidly remove dissolved water and gas. Keep your oil clean, dry and reliable!

V10 Model

Large air cooled condenser

Air inlet breather. (particulate or desiccant)

Dual stainless steel condensate tanks standard with clear covers for visual process inspection

Several High output vacuum pump options available (lubricated vane dry seal shown)

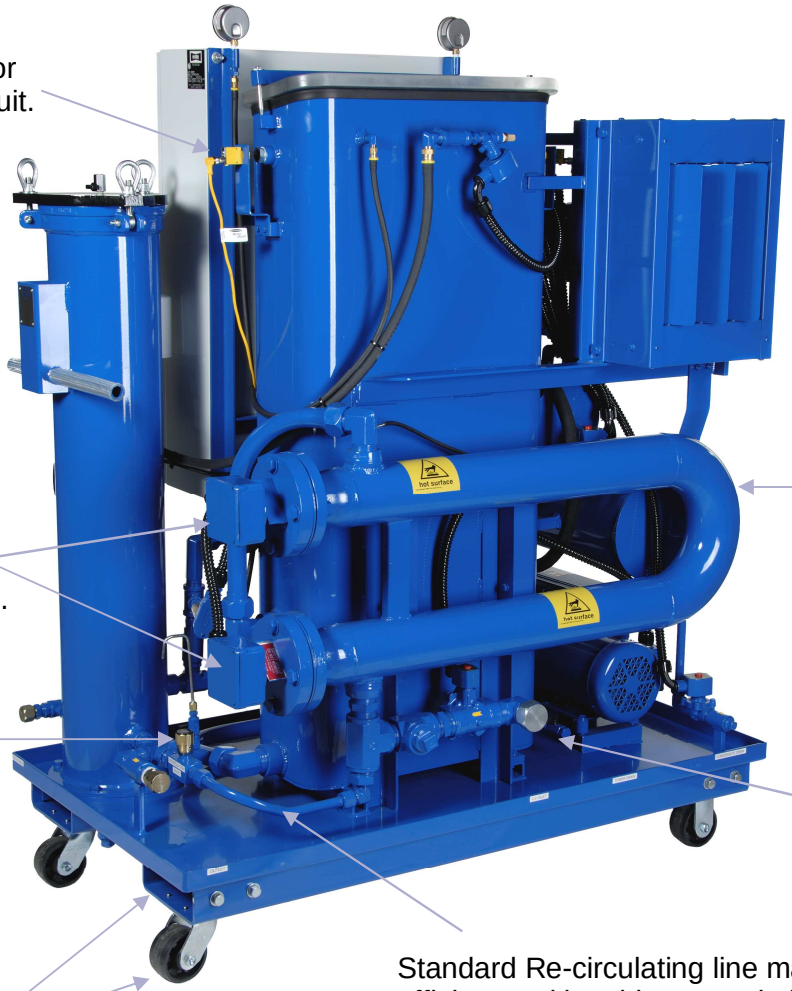
Clear vacuum chamber and condensate tank covers for visual monitoring of dehydration process.

Top loading particle filter assembly with coreless filter element and true Δp gauge

Auto water drain circuit allows for 24 x 7 continuous unattended operation

Flexibility of design dimensions & process arrangement is an available option. We'll listen then customize a VAC-U-DRY for your specific application.

User friendly . . . Clear vacuum chamber and condensate tank covers allow you to see the performance (condensation and collected water).



Optional foam sensor and knockdown circuit.

All condensate wetted parts are 304 stainless steel (standard)

Low watt density fin tube heaters prevent coking with no direct contact between heating element & fluid.

Ample plumbing makes Vac-U-Dry suitable for fluid viscosity to 460 cSt. Ideal for high viscosity lubricating fluids

Re-circulation line control valve

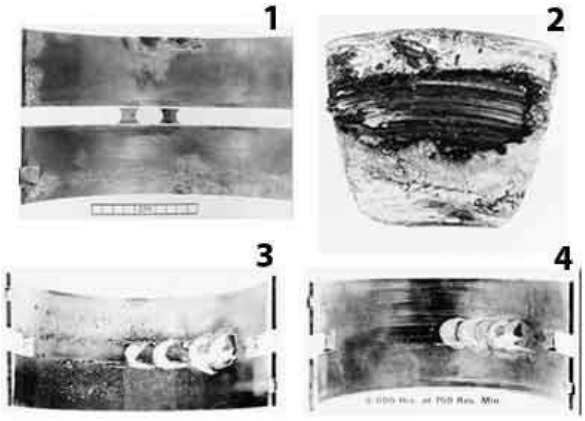
Vac-U-Dry inlet

Solid non-shedding wheels and forklift guides standard

Standard Re-circulating line maximizes efficiency with cold start and allows adjustment system return flow rate.

Model	Length Inch (mm)	Width Inch (mm)	Height Inch (mm)	Crated Weight Lbs (Kg)	Dispersal Element Qty.
V3	56 (1422)	32 (813)	48 (1219)	1300 (590)	2
V5	56 (1422)	32 (813)	60 (1524)	1900 (863)	2
V10	56 (1422)	32 (813)	60 (1524)	1900 (863)	3
V15	56 (1422)	32 (813)	60 (1524)	1990 (904)	3
V20	72 (1829)	36 (914)	60 (1524)	2100 (954)	4
V30	84 (2134)	40 (1016)	60 (1524)	2500 (1136)	4 (ext. length)
V45	84 (2134)	48 (1219)	60 (1524)	2840 (1290)	8 (ext. length)
V60	84 (2134)	60 (1524)	60 (1524)	3210 (900)	8 (ext. length)

*Dimensions and weights are for standard models. Additional options may increase Vac-U-Dry size.



The Harmful Affects of Water in Oil

Water is one of the most common and most damaging contaminants found in a lube or hydraulic system. Continuous or periodic high water levels can result in damage such as:

- Metal Etching (corrosion)
- Abrasive wear in hydraulic components
- Dielectric Strength Loss
- Fluid Breakdown
- Additive precipitation and oil oxidation
- Reduction in lubricating properties

75% of All Hydraulic Component failures are Caused by Fluid Contamination

The effects of moisture in your oil systems can drastically reduce on stream plant availability. Bearing life and critical component life is greatly reduced by moisture levels above and within the saturation point. Many systems run constantly above this point due to inefficient dehydration technologies and high ingression. This develops acidity and loss of lubrication properties. Free water occurs when oil becomes saturated and cannot dissolve any additional water. This water makes the oil appear cloudy and can even be seen in puddle form at the bottom of a reservoir. Water which is absorbed into the oil is called dissolved water. At elevated temperatures, oil has the ability to hold more water in the dissolved state due to the expansion of the oil molecules. As the oil cools, it loses its capacity to hold water and free water will appear where previously not visible. Fluid type also determines saturation point in addition to temperature changes.

Fluid	Saturation PPM	Saturation %
Hydraulic	300	0.03%
Lubrication	400	0.04%
Transformer	50	0.005%

New Moisture Level PPM (%)

Current Moisture Level (PPM)	1000 (0.1%)		500 (0.05%)		250 (0.025%)		100 (0.01%)		50 (0.005%)	
	Rolling Element	Journal Bearing	Rolling Element	Journal Bearing	Rolling Element	Journal Bearing	Rolling Element	Journal Bearing	Rolling Element	Journal Bearing
5000	2.3	1.6	3.3	1.9	4.8	2.3	7.8	2.9	11.2	3.5
2500	1.6	1.3	2.3	1.6	3.3	1.9	5.4	2.4	7.8	2.9
1000			1.4	1.2	2	1.5	3.3	1.9	4.8	2.3
500					1.4	1.2	2.3	1.6	3.3	1.9
250							1.5	1.3	2.3	1.6
100									1.4	1.2

Component Life Extension by Removing Water*

*courtesy of Noria

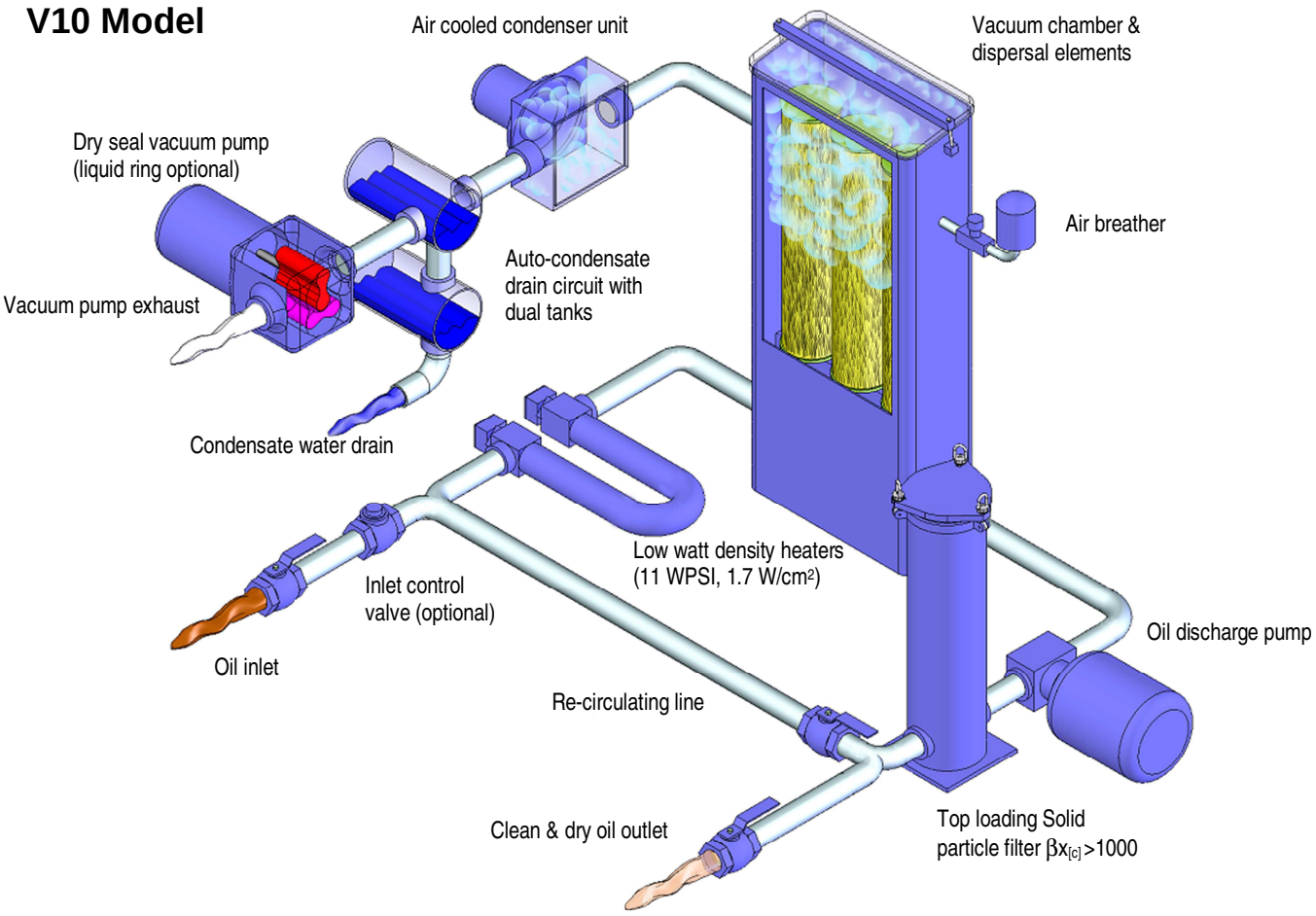
Increase "Must Have" Plant Reliability

Centrifuges only remove free water that is well above the saturation point leaving harmful quantities of free and dissolved water in the oil. Desorbers and coalescing filters can achieve water levels of 150 ppm, but the process can be much slower or impossible with the presence of surfactants and additives. VAC-U-DRY rapidly removes water (below 20 ppm (0.0020% with desiccant breather) with efficiency to control water levels under normal ingression and regain control of high ingression conditions in hours instead of weeks or months.

Contaminant Type	VAC-U-DRY Capability
Water	Remove 100% free water 90% + dissolved water
Particulate	ISO Cleanliness Code 13/11/8 per ISO4406:1999
Gases	Remove 100% free gases 90% + dissolved gases
Air	Remove 100% free air 90% + dissolved air

The VAC-U-DRY Purification Process and Flow Diagram

Contaminated oil is drawn into the VAC-U-DRY purifier by a high output vacuum pump. The oil passes through the low watt density heater where heated to optimum temperature for the dehydration process (150°F, 66°C). The oil enters the vacuum chamber passing through specially designed dispersal elements which create a thin film of oil that is exposed to the vacuum. The water is vaporized and then drawn into the condenser where it becomes liquid and drains into the condensate tank.



The dehydrated oil flows to the bottom of the vacuum chamber and is removed by the discharge pump. The oil is pumped through the high efficiency particulate filter assembly ($\beta x_{[c]}$ >1000) and returned to the system. The re-circulating line helps the VAC-U-DRY reach optimum temperature in cold start situations and can be used to throttle machine inlet and outlet flow.