



Pall Corporation

Turbine Lube Oil Conditioner



Vacuum Dehydration
Purifier for Dissolved
Water Removal

Coalescer for Rapid
Free Water Removal

Coreless Ultipor® III
Filters to Remove
Particulates

The Pall Turbine Lube Oil Conditioner...

Guaranteed Performance

The Pall Turbine Lube Oil Conditioner eliminates free water, reduces dissolved water to 100 ppm, and removes particulates to ISO 16/14/12, or better.

Automated Operation

PLC controls with diagnostic automatic shutdown are standard on all units.

Startup Support

Factory representative is present during startup to provide assistance and perform fluid sampling for cleanliness qualification.

Rapid Reservoir Turnover Rate

Designed for high fluid flow rates, the Pall Turbine Lube Oil Conditioner produces reservoir turnover rates that meet or exceed OEM recommendations.

No Water Hookup Required

Optional moisture condenser is air cooled, eliminating the need for a dedicated water supply.

Reduced Oil Oxidation

Dissolved water removal is performed via vacuum dehydration. Therefore, the potentially harmful high heat requirement of flash distillation units is avoided.

Environmentally Friendly

The Turbine Lube Oil Conditioner incorporates Pall Coreless Ultipor® III filter technology to reduce the disposal costs of landfilling oil soaked filter elements.

Features

Coalescer to rapidly remove bulk free water.

Vacuum dehydration unit using mass transfer technology to remove up to 80% of dissolved water.

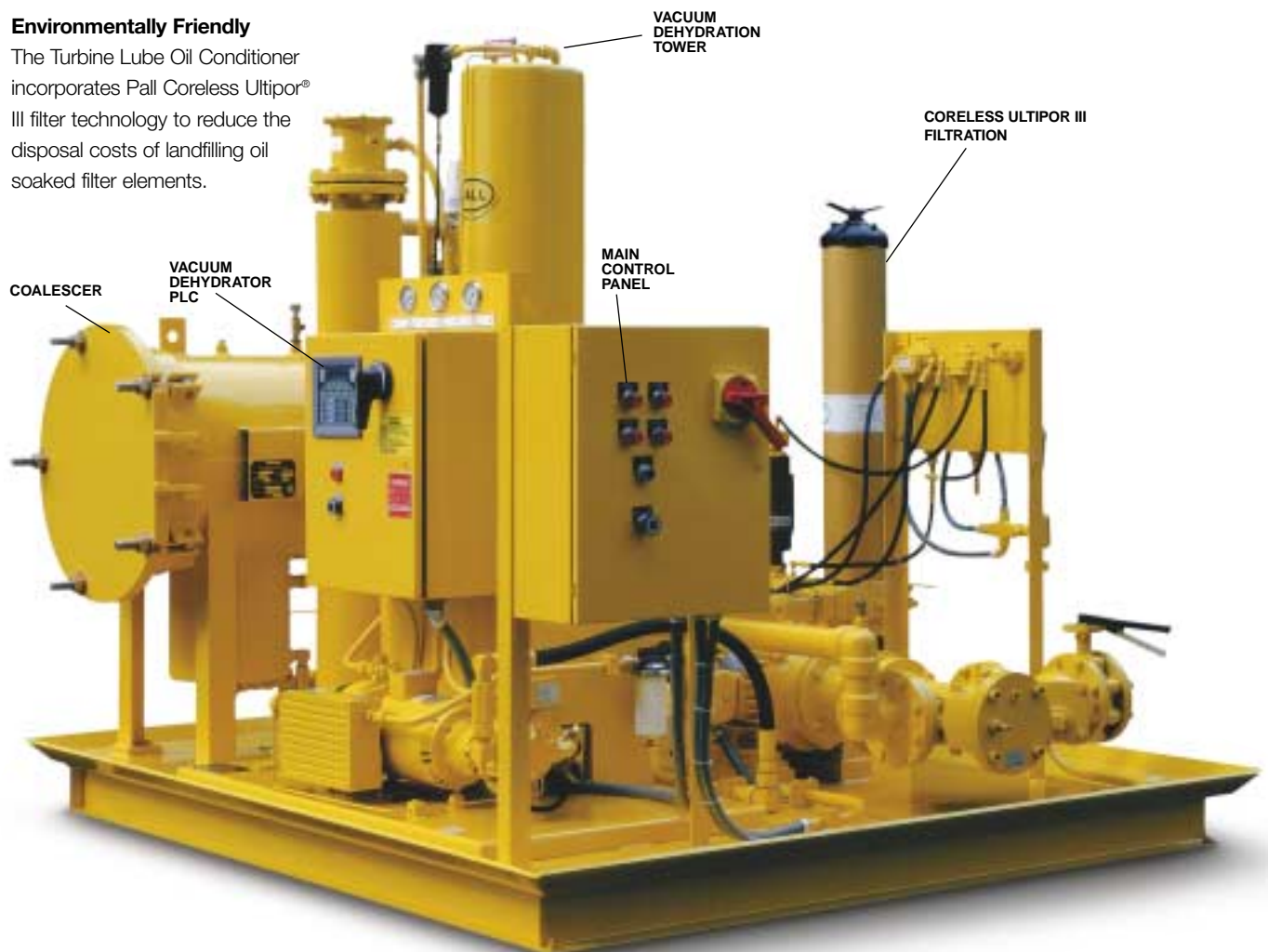
High flow filtration using Pall Coreless Ultipor III filter elements to remove harmful particulate contamination.

Simplified design for low maintenance and ease of service.

Customized skid fabrication for optimum flow rates.



The Pall Turbine Oil Conditioner will protect the system from any water contamination condition.



Increases Turbine Reliability and Reduces Operating Costs.

Harmful Effects of Water Contamination

The presence of both free and dissolved water in lube oils is detrimental to the overall performance of the lubricating system.

Water in the turbine lubrication system causes:

- Corrosion
- Reduced oil lubricating film thickness
- Oil oxidation and breakdown
- Accelerated metal surface fatigue
- Sludge formation

It is widely accepted that free water represents the major cause of problems associated with water contamination. There are numerous devices available for removing the free water from lube oils.

However, a lube system achieves maximum protection only when all free water is removed and dissolved water is minimized.

Effects of Free and Dissolved Water

Water can be present in oil as free water and dissolved water. In the same way that air is said to have 100% relative humidity when it contains all the water vapor it can hold, oil is said to be saturated when it contains all the dissolved water it can hold. Free water can be present only after the amount of dissolved water in the oil has exceeded the saturation point. Oil containing free water will appear hazy or cloudy.

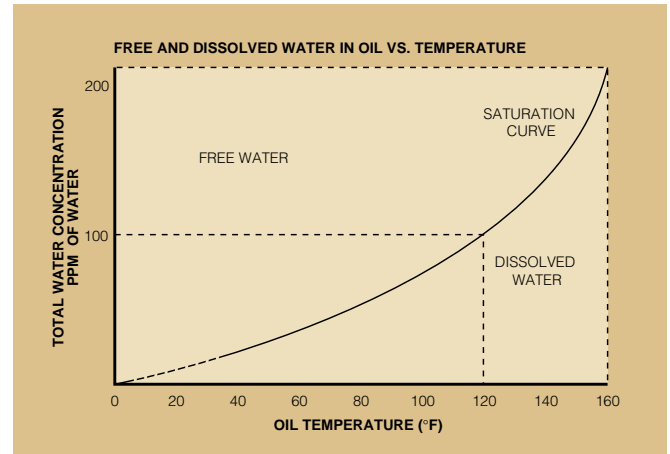
Free water settles in quiescent areas of sumps, reservoirs, bearing pedestals, and governors. Even an oil with a good rust inhibitor cannot completely protect components from settled free water. The rust created from corrosion is carried throughout the system, acting as an abrasive agent, causing wear.

Dissolved water can be converted to free water. As illustrated in Figure 1, an oil can hold a limited amount of dissolved water before reaching saturation. This amount of water decreases with decreasing temperature and increases with increasing temperature. When turbine lube oil saturated with water is cooled (often as much as 40°F) between the lubrication pump and the bearings, free water is created by decreasing the oil's saturation point. Free water reduces the effective viscosity of the fluid in the bearings, reducing critical dynamic clearances.

In addition, dissolved water contributes to oil oxidation. It has been demonstrated that water, in the presence of metals such as iron and copper, greatly accelerates oil oxidation to form acid (see Figure 2).

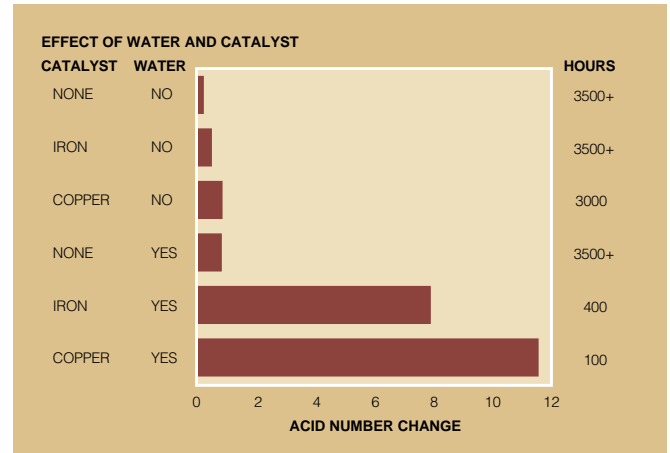
Table 1 shows the negative effect that free and dissolved water have on bearing life. Based on Figure 1, it is likely that the 100 ppm water concentration in Test 2 is all dissolved water. Comparing life data from Test 1 to Test 2 shows that increasing water concentration from 25 to 100 ppm reduces bearing life by a factor of 2.6 (revealing the harmful effects of dissolved water). Test 3 shows additional bearing life reduction resulting from increased water contamination beyond the saturation point of the oil.

Figure 1.



Ref: EPRI CS-4555 (typical turbine oil)

Figure 2.



Ref: Weinschelbaum, M., Proceedings of the National Conference on Fluid Power, VXXIII: 269

Table 1. (150°F oil temperature)

Test	Water Level	Relative Life of Bearings
1	25 ppm	4.98
2	100 ppm	1.92
3	400 ppm	1.00

Ref: Effect of water in lubricating oil on roller bearing fatigue life, 31st Annual ASLE Meeting, 1976

Ordering Information

Assembly P/N: **TLC**

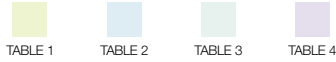


Table 1

Flow Rate Option	
Code	Flow Rate
125	125 gpm
200	200 gpm
290	290 gpm

Table 2

Vacuum Dehydration Purifier Option	
Code	Purifier Model
V9	HVP 902
V27	HVP 2702

Table 3

Coalescer Option	
Code	Coalescer
C	Included
N	Not Included

Table 4

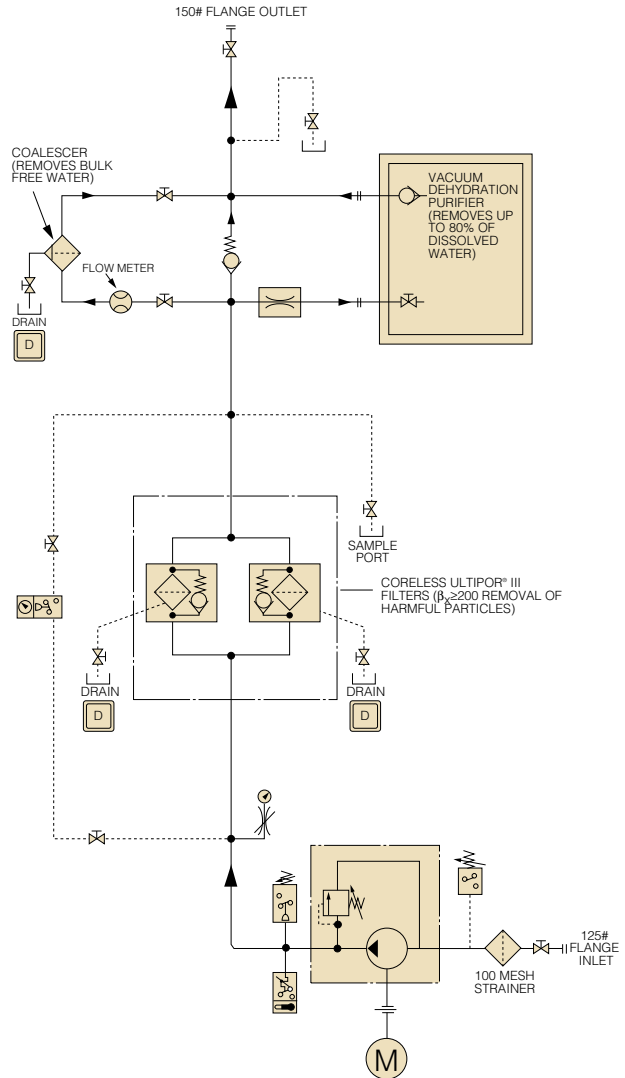
Supply Voltage Option	
Code	Voltage
Omit	460V
575	575V
380	380V

Configuration						
Model	Filter Housings	Overall Dimensions			Port Size	
		Width	Length	Height	Inlet	Outlet
125*	1-8314 series	84"	94"	85"	4"	2 1/2"
200*	2-8314 series	94"	94"	85"	5"	3 1/2"
290**	3-8314 series	71"	130"	85"	6"	4"

* With HVP 902 purifier
 **With HVP 2702 purifier

Note: Custom flow rates and configuration available—contact factory

Versatile design meets varied application requirements



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