



Application Note

Prevent Dry Running of Pumps



PRESSURE GAUGE | SWITCH | TRANSMITTER | DATALOGGER

Prevent dry running of pumps

Pumps use the liquid they are pumping as a coolant, part of the heat generated by the pump dissipates through the liquid that it's pumping. This prevents harmful overheating of pumps.

To ensure the correct operation of a pump, it is important that it's always in contact with the liquid it is pumping.

Dry-well conditions (Dry-running)

The term dry running is used when a pump is not in contact with the liquid it is pumping. In other words, the pump is working but has no liquid to pump. As previously mentioned, this represents a problem because this liquid is responsible for taking away the heat generated by the operation of the pump, if there is no liquid it begins to heat excessively, causing damage.

Problems caused by the low level of suction (Work in vacuum/dry)

The excessive heating generated by dry-running creates the following faults in a pump:

- Shaft seal damage.
- Fluid leak during operation due to shaft seal damage.
- Shaft damage.
- Motor overheats. When overheating, the insulation of the windings gets damaged and causes a short circuit that burns the motor.
- Last but not the least, cavitation due to insufficient NPSHa (Net Positive Suction Head available)

It is very important to have a system that protects the pump to prevent its operation if it runs out of liquid. There are different solutions for this problem depending on the application. Most popular is to measure differential pressure across the pump and stop the pump if the flow stops.

Ogauge to prevent and predict failures

The best way to reliably monitor a pump is to measure pressures – one at the suction nozzle, and the other at the discharge nozzle. Together with your pump performance curve, the inlet and outlet pressures will tell you how well your pump is performing, and offer clues as to how you can improve its performance. A pump running at its Best Efficiency Point (BEP) will run with very little maintenance for decades.

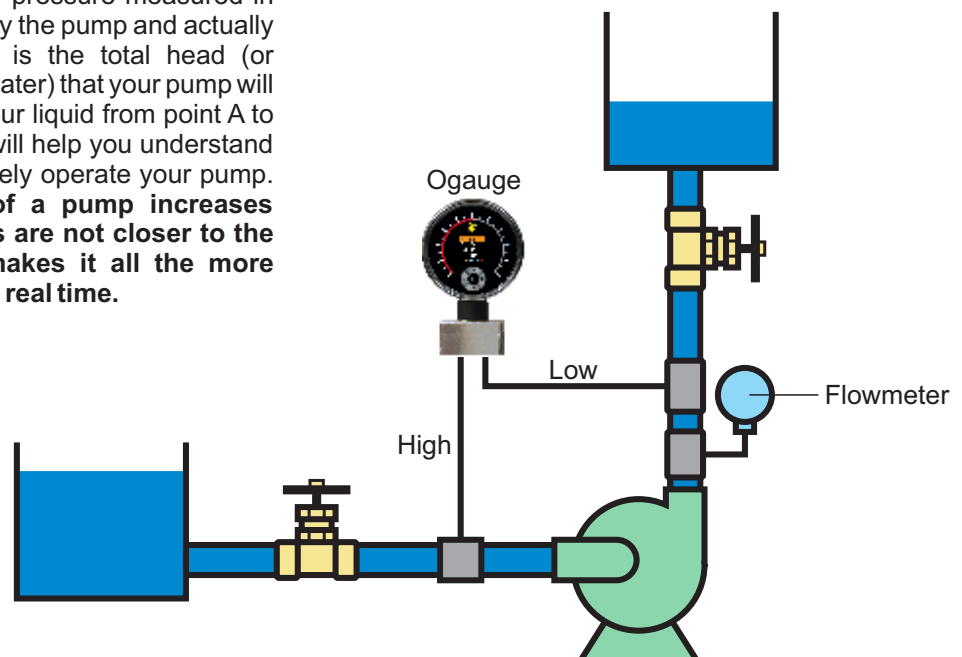
The pump's performance is based on the differential pressure between the suction and discharge nozzles. This is the energy the pump is able to add to the system in order to move it from point A to point B. To get the differential, you subtract the suction pressure from the discharge pressure. When you get to the basics of your pump system and performance, you'll end up calculating two important numbers – NPSH and TDH. Those two are Net Positive Suction Head and Total Dynamic Head.

NPSH is the suction head (or pressure measured in feet of water) that is required by the pump and actually supplied to the pump. TDH is the total head (or pressure measured in feet of water) that your pump will need to overcome to move your liquid from point A to point B. These two numbers will help you understand under what parameters to safely operate your pump. **The power consumption of a pump increases substantially if these values are not closer to the published values, which makes it all the more beneficial to monitor them in real time.**

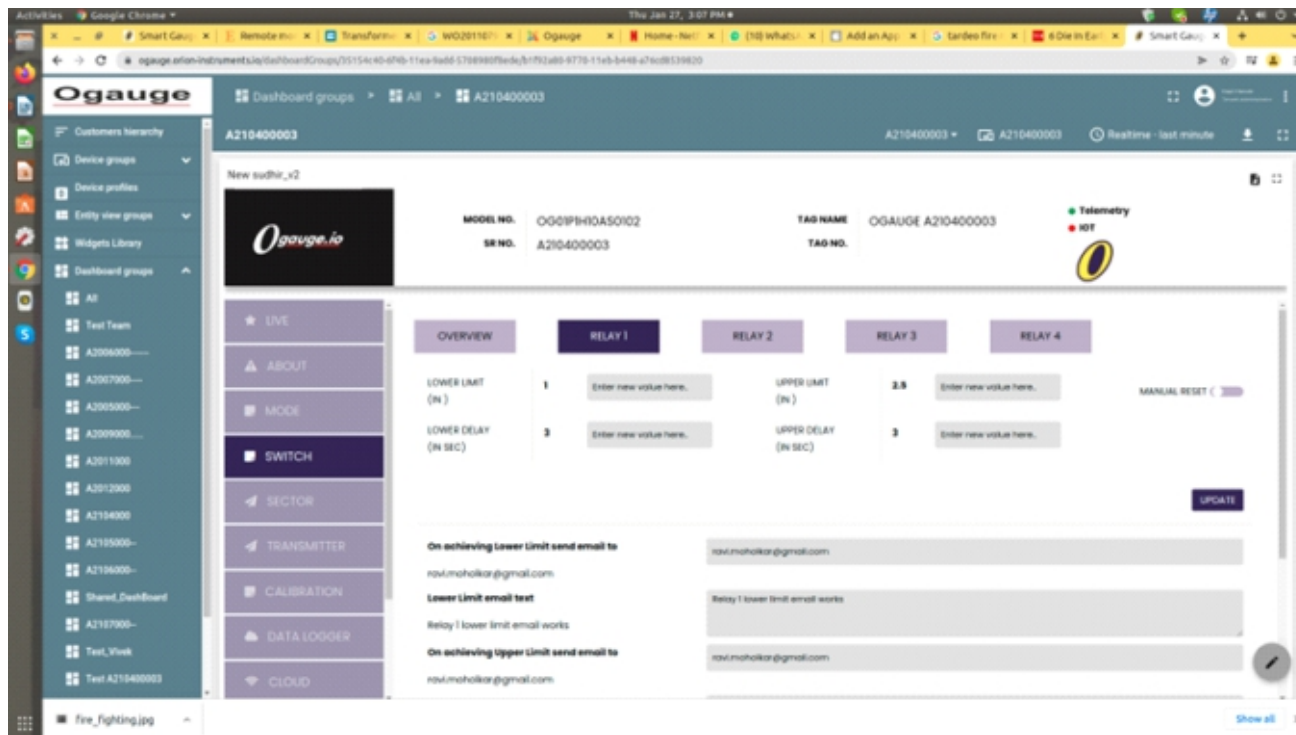
The best thing you can do to help your pumps operators is to install Ogauge across your pumps. With a constant awareness of how your pumps are performing, they can keep your pumps running smoothly.

Most companies wait for a pump to fail, and then simply replace parts on the pump. This is a costly and ill-fated endeavor. When a pump is simply repaired and put back into service, no work is done to figure out why the pump is failing and how to prevent the failure in the future.

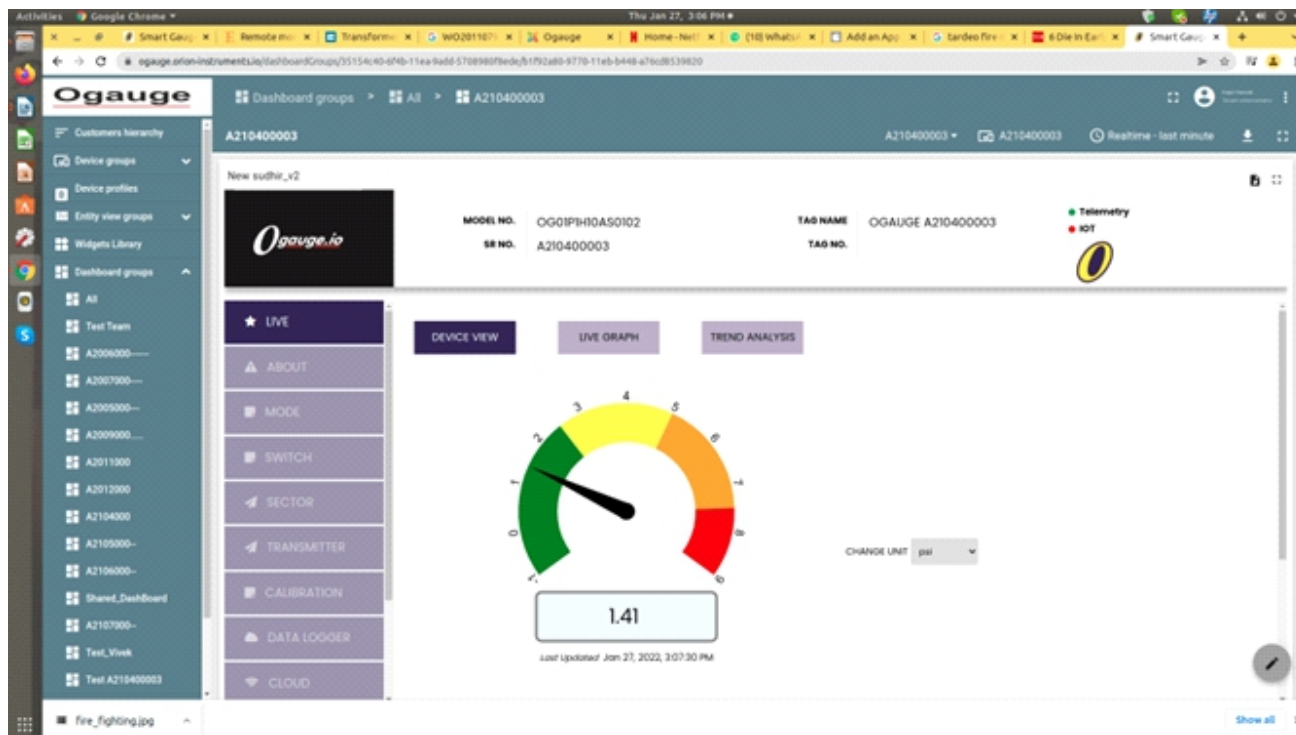
Give your operators the proper instrumentation they need to monitor pumps efficiency. Only then will there be enough clues in terms of data to determine what in the pumping system has changed, why the specified pump is experiencing difficulties, and how the problem can be permanently fixed.



With Ogaugue you can get **realtime pressures** on your dashboard, and even set alarms if the differential pressure falls below a certain value. Most of the wiring is eliminated, as data is transmitted wirelessly. The onboard relays rated at 5A, 250 VAC can be directly wired to switch off the pump. All datalogs will be maintained in the gauge, and also transmitted to the dashboard if the Ogaugue is connected to the cloud. All the software to get these values online, the necessary rights for individual users come bundled with Ogaugue.



The Ogaugue dashboard also offers live (realtime) monitoring of pressures, and trend analysis of relay operations and other parameters like suction and discharge pressures (when measured).



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