

## EnoTek Controller

# Redox Fermentation Control for the Wine Industry

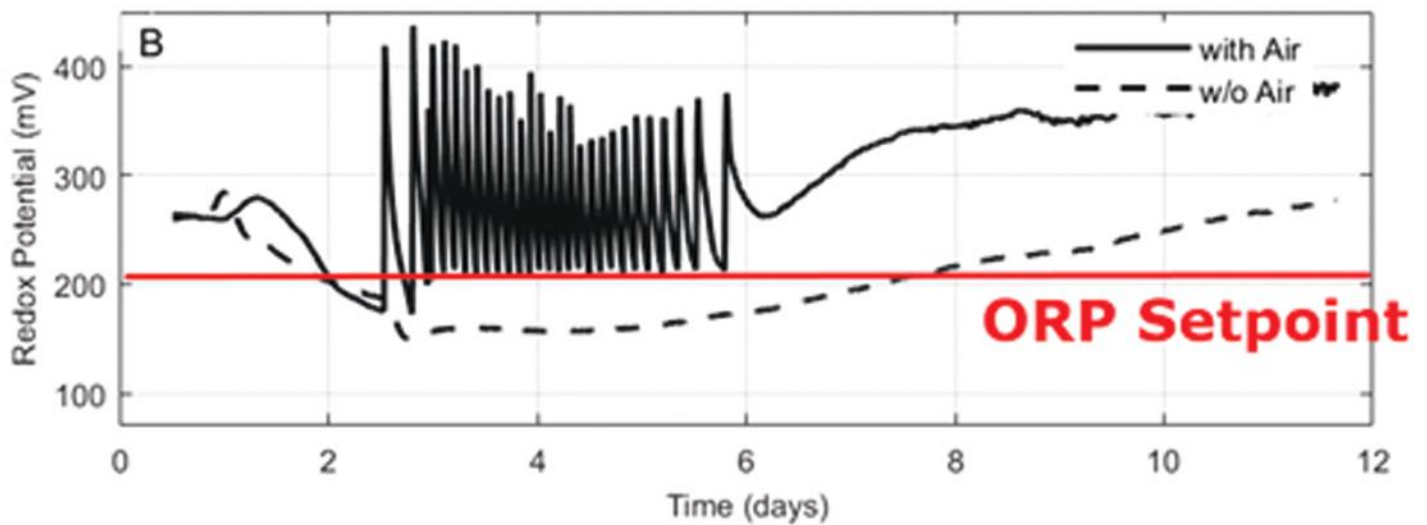
Hamilton Redox/ORP Probes and PID Oxygen Addition Integrated through the Flotek EnoTek



Oxidation Reduction Potential (ORP) or Redox potential is a dynamic process parameter that tracks with yeast metabolism in wine fermentations. Controlling ORP during fermentation can reduce reductive aromas and lead to more robust ferments. The EnoTek Controller by Flotek offers the ability to simultaneously track and control the redox environment of your fermentation.

ORP is a measurement value that encompasses pH, Dissolved Oxygen (DO), and all chemical half-reactions occurring in a system. ORP probes are better suited to tracking anaerobic fermentations than DO or CO<sub>2</sub> probes. Yeast consume oxygen so quickly that the DO is effectively 0 during fermentation. While CO<sub>2</sub> production is correlated with yeast metabolic output, but can be affected by fermentation variables such as temperature, microbes, chemical composition, and tank size/geometry.

The EnoTek is a self-contained Proportional Integral Derivative (PID) closed loop controller. It seamlessly integrates Hamilton sensor(s) with a touch screen where the user can determine an ORP set point. The controller logs the ORP values in real time and can be used to control the redox potential of fermentation through a number of different oxygen management strategies (pumps, diffusers, venturi, etc...).



(Figure adapted from (Advanced Monitoring and Control of Redox Potential in Fermentation, Killeen, Boulton, Knoesen, AJEV, 2018)

**Figure 1: Controlling redox potential in fermentation through addition of air.**

The EnoTek itself is compact, portable, highly adaptable to tanks and wineries of any scale. The controller is a cost-effective, user friendly interface for controlling and automating bioprocessing equipment. The EnoTek can communicate with existing winery systems or function as a stand-alone unit. The Controller can act as a stand-in for more expensive Process Logic Controllers (PLCs), allowing the user to,

## Advantages of Controlling Redox Potential via the EnoTek Controller:

- ☑ Higher yeast counts and more viable cells
- ☑ More robust fermentations (less incidence of problem ferments)
- ☑ Control the production of “reductive” aromas and hydrogen sulfide (H<sub>2</sub>S)
- ☑ Real-time data monitoring and logging of ORP and Temperature
- ☑ Automated Control of ORP around a redox setpoint

## EnoTek Controller Technical Specifications:

**Weight:** 5.9 lbs or 2.7 kg

**Materials:** Engineered Plastic- ABS

Linux Based Operating System

**Highly Adaptable Interface:** WiFi accessible (On/Off, Password Protected), 2x USB (2.0), HDMI (for monitors), Analog (4-20mA), Digital (Modbus), and Ethernet (RJ45).

**Scalable:** Base model comes with 2 pump connections

**User Interface/Operational Options:** direct monitor connection (via HDMI), USB for mouse and keyboard connection, or wireless connection to external touchscreen or tablet.

Internet Remote Access (Password Protected)

Another awesome product from,



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