industry: various

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WATLOW®
Powered by Possibility

subject:

ASPYRE® provides increased thermal performance

summary:

The ***ASPYRE***® family of smart power controllers monitors voltage in real time compared to other systems that simply monitor temperature. That means when a single heater or loop fails in a system, the ***ASPYRE*** will know it and automatically adjust power to keep the temperature constant as well as diagnose the problem and alert operators for maintenance.

two scenarios:

To illustrate the difference between open and power feedback, we will compare two very similar systems.

- Two 750-watt cartridge heaters
- A 50-watt light bulb
- 120 VAC
- F4T temperature controller
  - 250 degrees Fahrenheit setpoint
  - Thermocouple Type J input
  - PID P=35, I=215, D=35
  - Data log interval at 5 seconds
- ***ASPYRE DT*** power controller

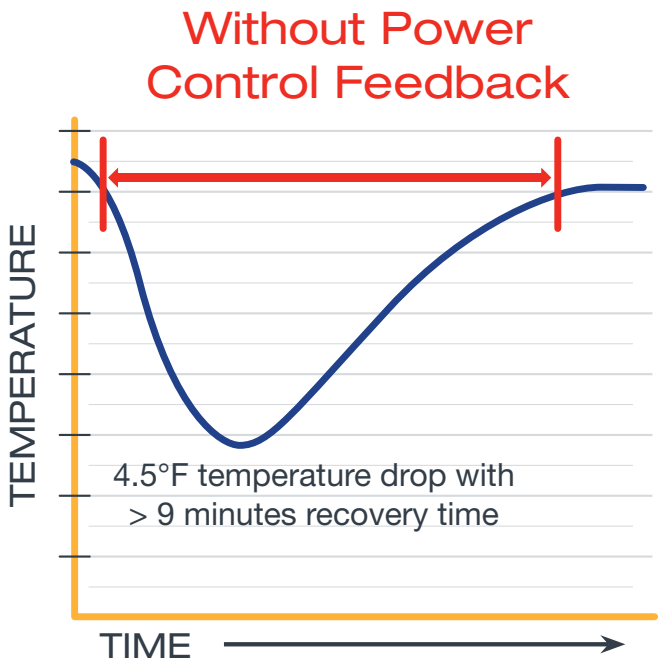
One system will use open feedback and the other will use power feedback. The difference is evident when each system loses one of two heaters.

open feedback:

In this traditional closed-loop system, the heaters are controlled with a simple on-off command. The power controllers are programmed to blindly turn on-off when given this command signal from the temperature controller using only temperature monitoring. When a single loop or heater fails, the temperature must drop multiple degrees for the problem to be detected by the sensors. Then the still functioning heater must operate longer to compensate for the failure before hitting the setpoint. There is often a time lag in both the temperature drop, and for the correction to take place. This lag time of both detection and recovery keeps the system out of the desired parameter for a painful period of time. Also, standard controllers will not diagnose the issue and alert operators.

Reactive control:

This system acts more reactively. And if temperature precision is key for the thermal application, it cannot be reliably met. The system only reacts to a temperature disturbance, and by then it can be too late. The graph below shows the variance in temperature and how long it drops out of the parameters for the application as the system reacts to the heater outage.

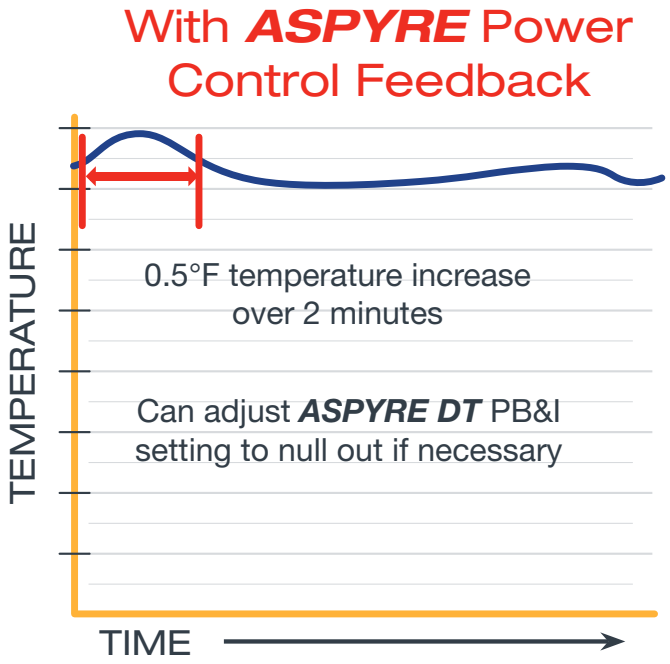


power feedback:

In a closed-loop system with an ***ASPYRE*** smart power controller, the system can be setup up similarly with a set point temperature. However, the power controller does not rely solely on temperature sensors to maintain thermal performance, it uses closed-loop power feedback in the system. That means when a loop or individual heater goes down, the ***ASPYRE*** knows immediately and can adjust the energy being delivered to the remaining heater to maintain a constant temperature the entire time. Fine-tuned precision is achievable consistently and reliably.

proactive control:

The ***ASPYRE*** is a proactive controller that recognizes issues as they happen and automatically adjusts to compensate. Plus, the ***ASPYRE***'s diagnostics capability ensures that malfunctioning components in the system are immediately identified for service. The graph below demonstrates how ***ASPYRE*** maintains a nearly constant temperature even with a load malfunction.



takeaways:

The ***ASPYRE*** family of power controllers is a game changer. It monitors power in a thermal system real time, provides proactive thermal control while also assisting with troubleshooting by intelligently providing diagnostics to aid with maintaining production quality, ideal system performance and reducing costly downtime. By not relying solely on temperature change, ***ASPYRE*** provides unmatched thermal precision.