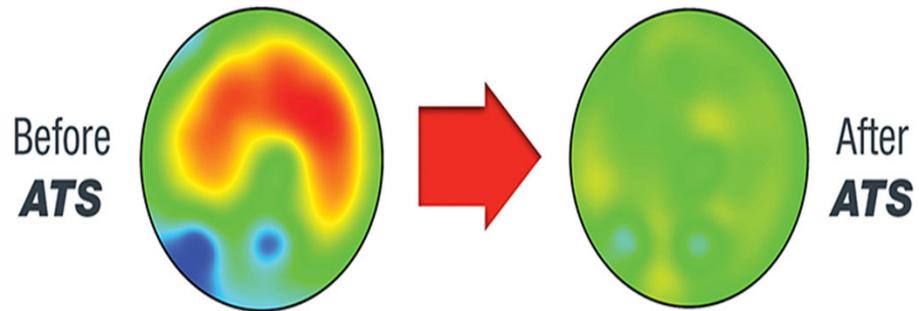


Why ATS™ is the Heating, Sensing and Controlling Suite of Tomorrow

By: - August 09, 2022



Watlow Introduces Adaptive Thermal Systems (ATS™)

(abcimg://watlow%20adaptive%20thermal%20system%20technology)

In the past, thermal systems always had tradeoffs that often made the “ideal” system out of reach. Whether budgetary concerns limit the number of temperature sensors, tight space requirements limit the number of zones or the technology limits how precise and accurate heating systems are, these systems are often born of compromise. Watlow’s Adaptive Thermal Systems® (ATS™) are designed to provide companies with the tools to build the heating systems they need without forcing compromises.

Power Conversion and Controllers

A great heating system needs a great controller. Some controllers are little more than an on-off switch. Others require power to be conditioned before it enters the unit, which can drive up cost and space requirements. Watlow’s new EZ-ZONE® RMT controller provides revolutionary solutions to these problems.

Because it provides both rectification and buck conversion, it can work in varied situations without adding additional equipment. It is also smart enough to offer closed-loop control for each heater with just a single controller unit, cutting down on wires and cost. Plus, it is equipped to take advantage of thermocouple heater (TCH) junction temperature control, and an improved fault detection system that makes diagnosis and control more straightforward than ever. It is just one of three new controllers, including the EZ-ZONE® RMG gas line controller and the POWERGLIDE® controller, designed specifically for multi-zone aluminum nitride ceramic pedestals, providing a controller for just about any heating scenario imaginable.

High TCR Materials and TCH Temperature Control

Of course, better controllers are worth the investment only if you can achieve better control throughout the system. Improved control requires more sensors, which has historically been a costly proposition. High temperature coefficient resistance (TCR) materials respond to temperature changes with a change in resistance. By measuring that change, we can know the temperature at that location. Building heaters out of high TCR materials adds a sensing capability, adding measurements to places where they were previously impossible due to space or cost requirements.

Likewise, integrated TCH junction temperature control turns heater power leads into a thermocouple junction. The voltage at this junction varies consistently with the surrounding temperature, so measuring it provides a spot measurement of the temperature at that location. Together, these two technologies offer expanded sensing options without additional wiring or requiring extra controllers.

Multi-Loop Control and Sensing

Adopting high TCR materials or TCH junction temperature control can lead to an explosion in the amount of available data, which can in turn be used to fine-tune processes and operating costs. However, in other systems, the increased capabilities would lead to an exponential increase in necessary wiring, which may not be possible due to space or budgetary requirements.

Watlow's multi-loop control uses a multiplex wiring scheme that enables as many as 10 times the number of zones per wire when combined with high TCR materials. Increasing zone density allows for unparalleled sensing and control without creating budgetary issues.

Likewise, Watlow® developed a standardized harness for the ATS system. Standardizing this harness reduces the complexity of installations and the number of design passes needed before installation can begin.

The Power of Modularity

ATS' true power comes from the fact that each system component is beneficial on its own, but together, they can transform a heating process from end to end. Whether designing a system from scratch or redesigning one that has not quite lived up to your expectations, ATS brings something new to the table.

Many thermal system design projects reinvent the wheel at each stage of the process. ATS' modular, "off-the-shelf" approach to many components not only lowers cost but also reduces the number of design iterations needed before implementation, reducing lead time and further lowering costs.

However, it is essential to remember that ATS is still customized to the exact needs of each application. Due to that, it represents the best of both worlds: A system that can deliver the accurate temperature control needed for modern manufacturing while avoiding painful compromises related to

cost, space, sensor density, heating control accuracy and precision and more that other systems face.

Final Thoughts

Even though we have covered a lot here, we are only scratching the surface of what ATS is capable of. The technologies we have profiled here provide a good overall view of the advancements that make ATS so revolutionary. However, some other parts and products are part of this line but designed with specific industries in mind. We encourage you to explore those before your next project.

It is also critical that, as you explore your next heating process, you do not get stuck thinking about the possibility in terms of what has been done in the past. ATS' new controllers, heating elements, sensors and more can help companies achieve breakthroughs in cost, efficiency, accuracy and precision, and data production, which can be used to help drive the next generation of growth in your manufacturing lines.