

clinical equipment
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The Role of Heating Technology in Medical Equipment



Summary:

There are around 10,000 different medical devices on the market today. Each individual piece of equipment must be manufactured to the highest standards to ensure accurate, efficient and safe results. Here, Andy Selvy, chief system designer at industrial technology company Watlow[®], discusses medical device trends and how heating technology plays a vital role in the function of medical equipment.



The term medical device refers to any instrument, apparatus or appliance involved in the diagnosis, treatment or improvement of life. Each component used to create the device must be built with patient safety, reliability and effectiveness in mind. What is lesser known is the role heating technology plays in some of the most commonly used forms of medical devices.

Device trends

Medical device manufacturing is a burgeoning market. For example, the U.K., which is home to over 2,000 device manufacturing companies, is the third largest medical device market in Europe, behind France and Germany, and is expected to be worth over £5 billion by 2025.

Currently, there are several market trends that create unique thermal challenges. These include the miniaturization of devices, increased throughput for diagnostic equipment and a shift towards point-of-care diagnostics focused on preventative care and faster medical decisions. From an original equipment manufacturer (OEM) perspective, they must also contend with increased globalization efforts such as leveraging a single device in all regions of the world.

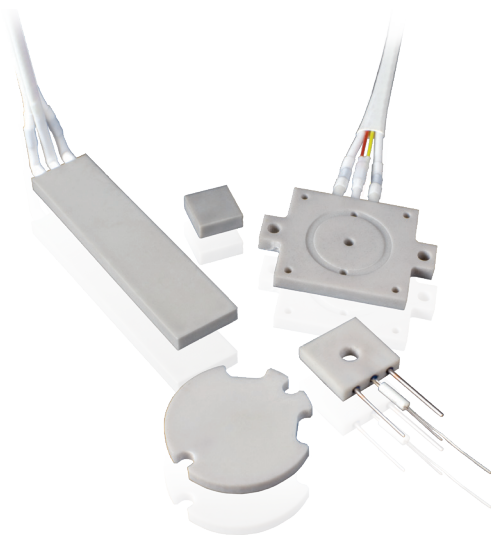
This shift creates several manufacturing challenges. For instance, producers of medical devices must now consider a greater number of voltage requirements and increasingly stringent safety standards. For those focusing on making devices smaller, there are the associated challenges of still delivering high performance and ensuring careful, considered placement of each component to maximize space.



Heating tech in medical devices

From anaesthesia delivery systems and respiratory therapy devices, such as ventilators, to blood and intravenous (IV) fluid warmers and transfusion equipment, heating plays a crucial function in many medical devices. Without these highly specialized heaters, humidity could not be added to respiratory equipment, instruments could not be sterilised and fluids that help to stabilise body temperature post operation, could not be comfortably and safely injected into the body.

When selecting an industrial heating equipment manufacturer to support with a medical device project, it is important to consider a company's portfolio of thermal solutions for the industry. Watlow®, which has manufactured heating technology such as controllers, heaters and sensors since 1922, is accomplished in providing OEMs with solutions that enable exceptional thermal control, meeting the most demanding product specifications like combining miniaturisation and high performance.



For instance, its **ULTRAMIC**[®] advanced ceramic heater is ideal for realizing the minimization trend. Providing thermal performance up to 155 watts per square centimeter (cm) in a package size as small as eight millimeters (mm) squared, and with onboard sensing for closed loop temperature control, the **ULTRAMIC** saves space, reduces the machine's overall footprint and simplifies the manufacturing and assembly process.

In addition, Watlow's thermal solutions are engineered and manufactured with safety in mind. Combined with decades of thermal systems expertise, our knowledge of system level safety standards such as IEC 60601-1 enables us to help optimize the customer's system architecture.

There in times of crisis

Several Watlow products have been used in medical devices during the COVID-19 pandemic. For instance, one medical device manufacturer is using our **ULTRAMIC** advanced ceramic heaters in a product that treats COVID-19 patients, which has proven effective in preventing people from requiring ventilators.

Elsewhere, our foam-in-place silicone rubber heaters have been used to help with COVID-19 vaccine testing. Additionally, Watlow's **EZ-ZONE**[®] panel mount (PM) controllers are being used by another company to control air flow and negative vacuum conditions in hospital tent systems.

Heating technology acts behind the scenes to ensure the critical function of various medical devices. When developing new technology, OEMs should consider partnering with a heating expert that understands the regulatory environment they must operate in and can work alongside them to create life-saving innovations.



For more information about Watlow's solutions for medical applications, visit:

www.watlow.com