



Case Study

Safeguarding Cooling Performance in Heat-Based Surgical Procedures

Company

NEUWAVE™ Medical

Industry

Medical –
Ablation surgery

Products

Exergen micro IRt/c.SV
non-contact sensor

To ensure safety during surgical ablation, NEUWAVE™ developed a compact CO₂ cooling system to regulate ablation probe temperature. A critical requirement for the system was reliable, fast temperature measurement of the CO₂ gas tank. This was designed to monitor and confirm sufficient pressure to prevent failure. Exergen's non-contact sensor offered the speed, stability and accuracy needed to avoid procedural complications in real time.



Challenges

Parts of the ablation probe that do not need to conduct heat must remain cool during use, hence the need for gas cooling. Measuring tank temperature was made difficult since CO₂ tanks varied in size and condition across hospitals. Contact sensors were slow to acclimate before registering temperature, and unreliable on inconsistent tank surfaces. Without reliable temperature data, cooling failure could result in soft tissue damage, posing significant patient risk.

Solutions

The Exergen micro IRt/c.SV sensor delivered precise, real-time readings in under 50 milliseconds, even with mid-procedure tank replacements. Its compact design allowed easy mounting to the tank via a bracket, which also blocked stray heat reflections. The sensor maintained alignment through swaps and operated consistently across all tank sizes and conditions. With no acclimation delay or contact required, medical staff are able to rely on the micro IRt/c.SV to confirm system readiness and maintain safe cooling throughout each procedure.

Benefits

With Exergen's sensor in place, the medical team avoid delays linked to tank changes and ensured CO₂ pressure is always within safety limits. No recalibration is required, and the non-contact nature means minimal adjustment. The small footprint allows for easy integration into mobile carts, and its immunity to reflection make it effective across hospital setups. Overall, the sensor safeguards patient safety, reduces downtime, and delivers reliable performance throughout each procedure.



Instant temperature verification enables rapid CO₂ tank swaps without compromising patient safety or procedure time.

Results

Using Exergen's micro IRt/c.SV, the cooling system remained robust and responsive across a range of operating conditions. Staff could swap out CO₂ tanks rapidly and confidently, knowing the sensor would instantly verify pressure via tank temperature, without recalibration or manual adjustment. This helped avoid procedural delays and minimized risk to patient safety. Even in variable lighting and thermal conditions found in surgical environments, the sensor delivered consistent, accurate readings. This supported uninterrupted device function and reliable care delivery across diverse hospital settings.

Conclusion

This case demonstrates how compact, high-speed IR sensors like the micro IRt/c.SV contribute to safer, more dependable thermal management in sensitive medical applications. By delivering instant, consistent readings across different tank types and environments, the sensor supports precision and confidence throughout critical procedures. Its compatibility with mobile cooling systems and lack of field calibration requirements make it ideal for high-performance surgical settings, where accuracy, speed, and reliability are non-negotiable.