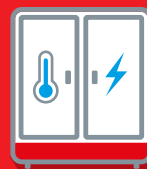


How smart refrigeration **case control** makes **energy saving** simple

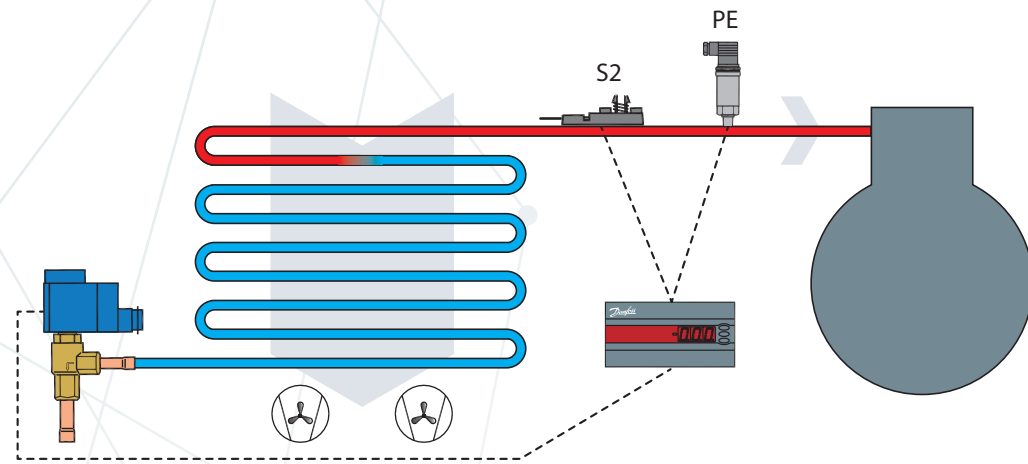
As food retailers look to reduce energy bills, every incremental savings counts. Increasing price competition means operating costs have an immediate impact on competitiveness and profitability—and, after staff, energy is the biggest bill most supermarkets have.

In food retail, most of that energy is spent on refrigeration, so efficient new components, like the AKVP electric expansion valve and high-end case controllers, are usually a good investment.

For example, a robust minimum stable superheat algorithm — which ensures the evaporator is always fully utilized under all conditions — can save 8-12% of energy use at the system level.



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But this method requires several components to work together perfectly. And this introduces a broader challenge: each new advance in technology also makes a system more complex. This can mean it's harder to install, service, and configure...unless you have help.

This is where today's smart case controllers (also called control solutions) make the difference. As refrigeration technology gets more sophisticated, the best modern case controllers handle that complexity for you, optimizing efficiency and helping you make good decisions.

Why the best case controllers emphasize simplicity

Think of a good case controller as the brain of your display case. It analyzes and optimizes performance, and coordinates the various components to maximize energy savings, while prioritizing food safety.

But for the best results, you need to understand how to use your controller effectively. And as technology advances, that becomes increasingly difficult.

So, while your controller's specifications and algorithms are important, it's also vital that it has an interface that's easy to use.

This will help your technician to work quickly and with more flexibility...whether they're installing a new system, or responding to a food safety alert, without technical support, in the middle of the night.

The natural next step in this process is smartphone apps, which communicate with the case controller and provide a graphic interface to make it even easier for the technician to install, configure, diagnose, and fix.

Case controllers need to be connected

Up to
12%
energy savings
compared to other
EEV technologies.

Safe, efficient refrigeration is a delicate balance—you have to match capacity to demand. Retailers can't afford to waste energy on unnecessary cooling, but food and system safety must not be compromised. Even though load conditions change rapidly, case temperatures need to stay within safe limits, and the compressor must be protected from liquid in the suction line.

As a result, static refrigeration setpoints usually include a margin of error. This feels safe for the retailer but wastes energy; around 2-3% for every 1K of superheat.

This is where the ADAP-KOOL® system can make a difference. By monitoring sensors in real time, the controllers can detect system changes and react accordingly to match performance to the load. Typically, this adaptive approach can produce energy savings of up to 33% compared to basic systems with TXV controls.

One popular way to do this is using Danfoss' Adaptive Superheat Control algorithm, which allows HFC and CO₂ systems to maintain

the minimal stable superheat under any load condition. This ensures the evaporator is always at its most efficient—but without the risk of returning liquid to the suction line.

This is one example of how your case controller and your compressor pack control can work together via a system manager. The two sides of your system work in harmony to achieve the balance you need.

Your controllers don't only need to be connected to each other. Connecting your case controller to the internet offers further opportunities to generate savings. If you can diagnose issues and control the case remotely, service engineers needn't be called out to simple situations like starting a defrost. And being able to compare performance and efficiency across an entire estate of stores makes it easy to spot patterns and make incremental efficiency gains.

Simplicity is vital in expansion valves too

If the controller is your refrigeration case's brain, the expansion valve is its heart. Just like a heart, it regulates flow to match the required performance.

As in other parts of the system, keeping things as simple as possible can help retailers make the most of new technology and achieve efficiency savings.

For example, Danfoss' world-leading AKVP expansion valve removes the need for a separate solenoid valve or battery pack to protect the system in the event of a power failure, as you might find in a stepper valve. The resulting design is safe, cost-effective, and simple to maintain.

Indeed, the new evolution of this design—the AKVP—takes this principle a step further by covering both HFC and CO₂ systems with one model, reducing the number of variants and thereby the complexity throughout the supply chain and service stocks.

To keep things simpler still, the valve is designed to work with the ADAP-KOOL® case controller to ensure the most efficient heat transfer and safely use the evaporator to its full capacity at all times. It also acts as an accurate flow meter, making it easy to diagnose and solve problems—so the retailer saves energy and service costs.

Need energy savings? Look at the refrigeration system first

Your refrigeration system is the natural place to look for energy efficiency gains. There are dozens of technologies that can tune your performance and efficiency to your exact requirements—if you haven't seen the capabilities of our new sensors and transmitters lately, it's definitely worth a look.

But those component-level gains are only part of a bigger, overall picture to optimize the way you use energy in your store. To unlock

that potential, you need a controller, expansion valve, and high-accuracy sensors that are smart enough to make the technology work together—and a system manager that can help you see and control the bigger picture.

The smarter those components are, the simpler your job becomes.

A robust **minimum stable superheat algorithm** — which ensures the evaporator is always fully utilized under all conditions — can **save 8-12% of energy use** at the system level.