

Case Story

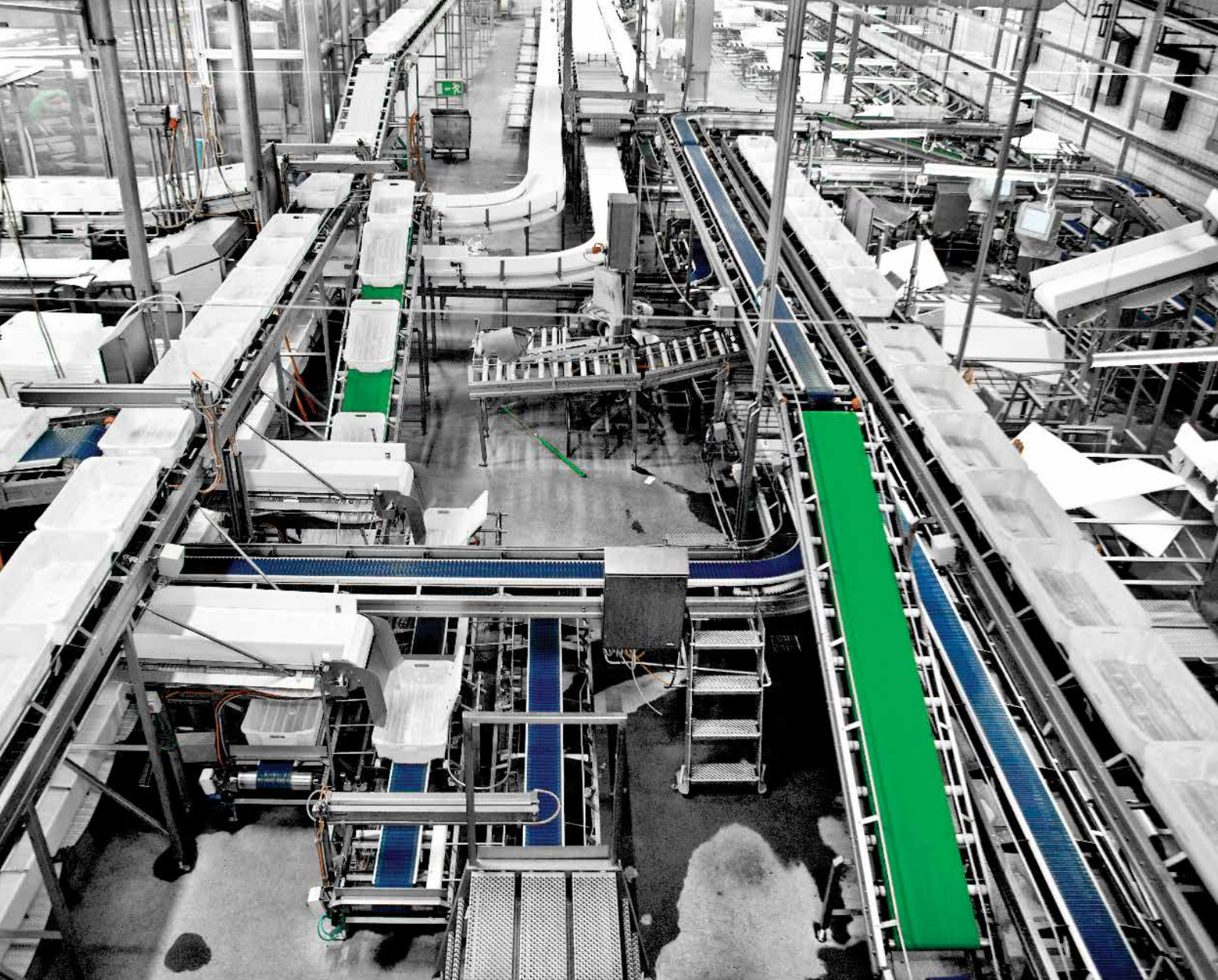
Danish Crown **improves process reliability** with **Integrated Motion Controller**

The VLT® AutomationDrive FC 302 with Integrated Motion Controller (IMC) has solved a costly problem for the Danish meat processing giant.



30,000

EUR annual savings
on motors alone,
thanks to IMC



The VLT® AutomationDrive FC 302 with Integrated Motion Controller provides 100% precise positioning, so that meat processing employees can carry out their preparations for the subsequent processing

The world's most modern meat processing plant

Since September 2004, the food industry giant Danish Crown has made Horsens, Denmark, its home. At the "super slaughterhouse," as it's been dubbed, more than 20,000 animals are processed each day – placing heavy demands on machinery, the employees and, in particular, the technology behind it all.

In 2016, the company launched its five-year strategy, known as "4WD." It is, in part, a growth strategy, but it is also a plan for optimizing production throughout the company. The strategy aims at putting greater distance between Danish Crown and its

competition, in the form of increased payments to the suppliers (the farmers) compared to the competing meat processing companies. Implementing this strategy places significant demands on both personnel and equipment. This is why initiatives for optimizing flow and regular maintenance, as well as cost reductions have been considered.

Danish Crown has approximately 1,000 VLT® drives installed throughout its plant in Horsens. They control everything from simple conveyor belts to more advanced applications. One of the most advanced applications is an "organ extractor."

The organ extractor has given rise to sizable challenges in recent years, as it was previously controlled by a closed-loop servo solution.

The application runs from 6 a.m. to midnight, Monday through Friday – and that places great demands on the technology.

The motors had to be replaced up to 37 times a year, as the resolver's fine mechanics had trouble functioning optimally in the meat processing environment.

As if it wasn't enough that a new motor used to cost the company EUR 1,100, an employee would of course have to replace it – and that took about an hour of labor each time. During that hour, the organ extractor could not operate and that part of the operations came to a halt.

100,000 animals weekly – a demanding operation

The previous servo solution had been in operation since the opening of the plant in 2004. However, the many motors that had to be replaced each year as a result of wear and tear from the servo solution, prompted the plant engineers to hunt for a more robust alternative. When they learned that the well-known VLT® AutomationDrive was now available with the Integrated Motion Controller solution, they immediately saw an opportunity to switch to a simpler, more stable solution.

Savings of over EUR 30,000 annually – on motors alone

Ole Toft Madsen, an automation engineer at Danish Crown, had considerable experience with VLT® drives, and therefore did not hesitate to commission the two new VLT® AutomationDrive FC 302 unites with Integrated Motion Controller himself.

In spite of the new functionality, the operation and set-up are the same as ever in the well-known AC drives. Together with Danfoss Drives Service, they managed to implement an effective solution which, since November 2017, has run problem-free at the plant.

“We put the solution in operation in November, and since then we haven't had a single ruined motor. We did not have to reconfigure the mechanical design and actually, the motor we're using now is one of the discarded ones from the servo solution,” Mr. Toft Madsen explains.

Mr. Toft Madsen also points out that, because they no longer have to replace motors so often, they are not only eliminating the cost of the equipment,



The VLT® AutomationDrive with Integrated Motion Controller provides significant cost and time savings at Danish Crown.

but also the man hours incurred each time a motor had to be replaced.

Integrated Motion Controller as alternative to a servo solution

With Integrated Motion Controller (IMC) functionality, an ordinary VLT® AutomationDrive FC 302 takes on simple positioning and synchronization applications, to thereby provide significant savings. Furthermore, the set-up and operation uses the same, well-known user interface of the VLT® drive.

Positioning and synchronization are typically performed via a closed-loop servo system – this in spite of the fact that many of these applications do not require the dynamic performance of a

servo system. This was also the case at Danish Crown, where the previous solution with servo control was not really necessary.

Many advantages with the new Danfoss Drives solution

As Ole Toft Madsen notes, the significant savings are not the only advantage provided by the new solution.

Danfoss Drives originally chose Danfoss Drives for several reasons:

- Stability, which ensures reliable production
- Simple operation of all VLT® drives
- Easy set-up ensures fast commissioning and servicing

Everything is used – nothing is wasted

At Danish Crown, the motto rings clear: “Everything is used – nothing is wasted.” All animals must pass stringent control inspections and are measured so that each production line knows the exact positioning required to achieve the best result.

That is why the slaughterhouse employs staff to prepare each carcass before the organ extractor takes care of the rest. The Integrated Motion Controller plays an important role in this process, as it provides precise positioning which, based on size, ensures optimal cutting. Danfoss’ solution provides open-loop

positioning with a PM motor that allows for very precise positioning, without encoder/resolver feedback.

“One complication with this application, however, is that the knives sometimes hit obstacles that cause the motor to “hop over” one or more magnets. Because of the open-loop control, the position is no longer correct. The solution to this consists of ‘homing on the fly’ using a simple sensor that automatically corrects positioning deviations each time the sensor is adjusted,” explains Ole Gernhøfer, Danfoss Drives product manager.

“Since commissioning, we’ve only seen ordinary wear and tear on the application, but we haven’t yet had to replace any motors. Before, we had to replace the motor every other week, and we often had to replace the knives, as well, because they quickly became dull.

Thanks to the ramp function of the AC drive, the motor now gets off to a softer start that is gentler on our knives, which means we save both time and money,” Ole Toft Madsen, from Danish Crown concludes.