

Creature Comfort

Intelligent drive technology in the cowshed

NORD Drivesystems

The Danish company Celi Invest has specialized in the production of electrically powered cow brushes. Since the Danes incorporated drive technology from NORD DRIVESYSTEMS, their intelligent and robust drives ensure reliable, safe and efficient operation. The result speaks for itself: happy cows and satisfied farmers.

To clean their hide, cows like to rub themselves against trees or on the ground. In addition to cleanliness, this scratching has another important effect. It stimulates the blood circulation in the skin as well as the metabolism and improves the health and wellbeing of the animals. In the cowshed, so-called cow brushes take over the role of the trees. "Cow brushes are a genuine revolution in cow care," says Carsten Papuga, Managing Director of Celi Invest ApS, a Danish cow brush manufacturer. "It has been scientifically demonstrated that healthy cows produce more milk. Our brushes enable thorough hide care and beneficial massages to ensure that the cows are more comfortable. This has a positive effect on milk production."

A Lucky Start

The fact that Celi now produces cow brushes is something of a coincidence. Actually, the company has been well known for its mobile bus and truck washing systems for more than 30 years. "Several years ago one of our customers — a company which transports pigs and cattle — told us about a new law which obliges Danish farmers to install a cow brush for every 50 cows in the cowshed and said: You should produce cow brushes," recalls Papuga. "We laughed about that. However, the customer remained adamant and so we started to work on this idea." What followed was a large number of discussions with farmers and the conclusion: Robustness and reliability are essential. "Cows are very strong. As well as this, the brushes are in operation for 15 to 18 hours per day. Cow brushes have to stand a lot of strain and must be strongly constructed," explains Papuga.

In September 2015 Celi Invest launched the first cow brush, initially with different drive technology — which

turned out to be a mistake. "We had several broken shafts," reports Papuga. "Because of this we soon changed to Nord. We have used the drives for many years for our bus and truck brushes and are familiar with their first class quality. However, when we started with cow brushes, Nord could not yet meet our control and price requirements." Nord development and application engineers worked intensively on a solution and since the beginning of 2017 Celi Invest has sold its cow brushes exclusively with technology from Northern

For the cow brushes from Celi Invest, Nord Drivesystems supplied a powerful combination consisting of a two-stage NORDBLOC.1 helical geared motor and a NORDAC BASE frequency inverter.





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Germany. "We now have more than 400 Nord gear units in use. Since then there have been no more complaints, and all drive units operate perfectly. We and our customers are very satisfied," Papuga says. "The service is also excellent. Nord takes good care of us."

Reliable drive technology from Nord

Nord Drivesystems supplies fully matched drive systems consisting of gear units, motors and frequency inverters for more than 100 branches of industry. For the Danish cow brushes, the drive specialist supplied a powerful combina-

tion consisting of a two-stage NORDBLOC.1 helical geared motor and a NORDAC *BASE* frequency inverter. The motor, the controller and the gear unit form a unit attached to the cow brush, which does not move with the rotation of the brush but rather remains rigid. "With the products from our competitors, the motor and the gear units move together with the brush. Faults and wear are therefore inevitable," explains Papuga. "Our cow brushes are the only ones on the market with a strong drive construction. This rules out cable breaks." A universal joint between the motor and the brush as well as 40 mm stainless steel bearings in front of the motor also ensure maximum durability. Both components absorb the torques and reduce the load on the motor.

In addition, the Nord drives are energy-efficient in operation, have a compact design, great reliability and a long service life. The innovative design of the NORDBLOC.1 helical geared motors guarantee quiet running and safe operation. Thanks to their wash-down design, they meet even the most stringent hygiene requirements. The gear units do not have any separating joints or closing caps. This increases the stability of the product and at the same time provides a smoother surface on which neither liquids nor solid materials can accumulate. A Certonal coating protects the electronics against condensation.

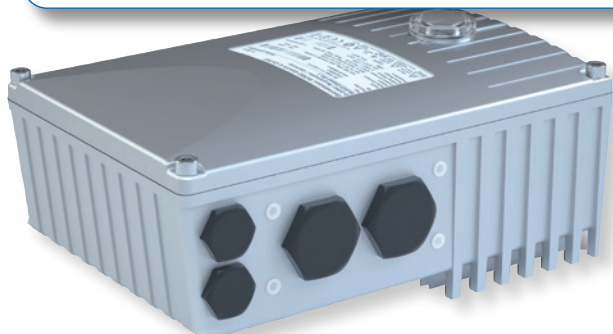
Greater safety and efficiency thanks to intelligent functions

The cow brushes are controlled by a NORDAC *BASE* frequency inverter. The compact and robust inverter is specially designed for simple applications and is especially economical. Through the integration of a PLC, application-specific functions related to the drive unit can be efficiently programmed and parameterized in



the same way as other functions of the NORDAC BASE – SK 180E. The brush starts to rotate as soon as a cow rubs against it. If there is too much resistance—for example if the tail gets trapped—the brush stops and then turns in the opposite direction. In addition, the direction of rotation changes on each start and at intervals of five minutes. This ensures even wear of the brush elements. “This intelligence is very important for us. We also like the fact that we can make minor changes to the program,” says Papuga. “For example, we can reduce the torque if we use the same brush for smaller cows—because smaller cows have shorter tails.” Another advantage is the energy saving function for the partial load range: The motor power adapts to load changes automatically according to actual requirements. This ensures energy-efficient operation. This is also helped by the use of gear drives. These can achieve an efficiency of up to 98 percent—and therefore use at least 50 percent less power than comparable cow brushes. Most manufacturers use single-phase motors with worm gear units, whose efficiency can be as low as 60 percent in the worst case. With regard to service life, they are also inferior to the helical gear units used by Celi Invest.

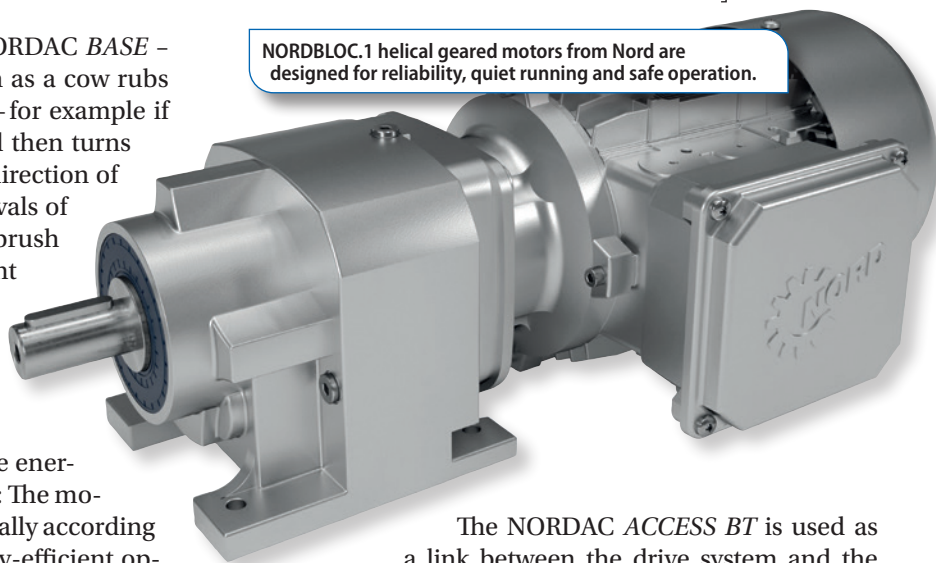
The NORDAC BASE frequency inverter by Nord Drivesystems offers an economic variant for simple drive applications.



Easy commissioning

Celi Invest uses the new Bluetooth stick NORDAC ACCESS BT with the NORDCON APP to parameterize the drives of the cow brushes. The mobile solution enables a temporary wireless connection and offers users completely new options for the control and optimisation of their Nord drive units. Thanks to the help function and rapid access to parameters, parameterization is quick and simple, and commissioning can be carried out very rapidly. In addition, the app has further practical features such as a backup and recovery function for simple handling of the frequency inverter drive parameters, as well as an individually configurable oscilloscope function for analysis of the drive. Video tutorials and the possibility of direct contact with Nord support additionally assist users in their work.

NORDBLOC.1 helical geared motors from Nord are designed for reliability, quiet running and safe operation.



The NORDAC ACCESS BT is used as a link between the drive system and the app. Users therefore have practical access to drive data and retain full access control. The stick can also be used without the app for transferring parameters between individual frequency inverters.

Fully satisfied

The customers of Celi Invest ApS include Sjoerd Ydema. The farmer operates a farm with 450 cows and cultivates grass, corn and cereals on an area of 600 hectares. A total of twelve cow brushes are available for the cattle. “We have used brushes from Celi Invest for about two and a half years and are very satisfied with them. The drives function well and at the moment there are no problems,” explains Ydema, who adds: “We used to have several brushes from another company. However, we have now replaced all of these with Celi Invest brushes with Nord motors. We think that these are the best.” **PTE**

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