

MAXXDRIVE gear units NORD for Jongia agitators in Smits Group biogas plant

NORD DRIVESYSTEMS supplies sixteen MAXXDRIVE gear units for Jongia agitators in the biogas plant of the Brabant agricultural company Princepeel, part of the Smits Group. These 'heavy duty' gear units can optimally withstand the high torques required to move the liquid mass in the rectangular fermentation bunkers.

From the hunting grounds of the Princes of Orange to a modern and sustainable agricultural farm: the Princepeel estate in Mill, North Brabant, has undergone a remarkable transformation in recent centuries. Since the mid-eighties it has been owned by the Smits family, of which the third generation is now at the helm. The family business strives for long-term continuity and continually invests and develops in sustainable entrepreneurship, without losing sight of the historical value of the estate. The company includes pig farms and an arable farm that focuses on the cultivation of potatoes, flower bulbs, corn, sugar beets, various vegetables and raspberries.

NORD's MAXXDRIVE gear units are located on the roof of the new fermentation plant. The previous installation is visible in the background.



Circular

Director Pieter Smits: "We try to work completely circularly. In our fermentation plant we convert manure from pig farming and crop residues from the agricultural business into digestate – an end product of the fermentation process – and biogas. With this we not only provide our own company with energy, but we also supply green gas and green electricity for approximately 12,500 households in the immediate area. In addition, we generate all the electricity for our own company. We use some of the digestate ourselves and sell some of it in granular form to third parties, including French wine growers. It is a good replacement for fertilizer. At our own company we pump it through pipes to the fields, so that transport by tractor or truck is no longer necessary. That is more sustainable and saves time." The biogas plant not only processes its own residual products, but also organic residual products from the food industry via its sister company KwaliFlex.

Jongia Mixing Technology and NORD

The Smits Group opted for the new installation for Jongia agitators. Pieter Smits: “We did an extensive market orientation for the required agitators, which ultimately led us to Jongia. They have a lot of experience in the industry. Because our installation has an almost industrial character due to its size, that experience was of great importance to us.” Jongia, which is located in Leeuwarden, has focused on the development of mixing and stirring technology for the food processing, chemical and energy sectors since 1937 and is now the market leader for biogas installations in the Netherlands.

Jongia built the drives for the agitators in the workshop in Leeuwarden.



MAXXDRIVE

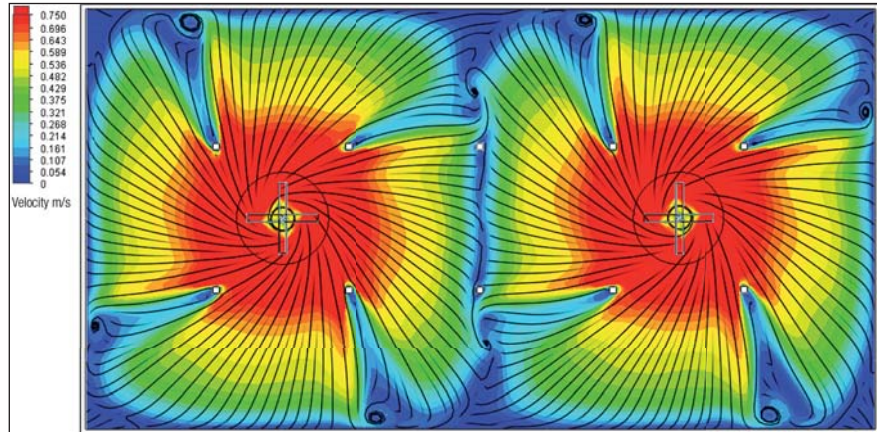
Jongia chose NORD's MAXXDRIVE gear units to drive the agitators in the new fermentation plant. Area sales manager Bart Brouwer: “Our agitators require powerful gear units. NORD supplies MAXXDRIVE gear units that exactly meet our requirements. In addition, NORD is known for the quality of its products. We are therefore confident that the gear units will do what they were purchased for.” NORD's MAXXDRIVE industrial gear units have a reduction ratio of 123:1, a power of 37 kW and an output torque of almost 29,000 Nm. Due to the application, the gear units comply with all ATEX standards. The particularly powerful gear units are necessary in view of the large dimensions of the fermentation installation and its shape – rectangular instead of round – so that a lot of power is required to move the mass through the agitators.

Rectangular

The new installation has a total area of approximately one hectare and consists of eight bunkers, each with two agitators on the roof. The released methane is collected at the top of the bunkers and supplied to the public gas network after cleaning and processing. Jongia's mixers ensure that the materials to be fermented form a stable and homogeneous mass in terms of temperature, viscosity and acidity, among other things, so that the microbes can do their work optimally and as much biogas as possible is created.

The individual concrete bunkers each have a surface area of 47.5 x 25.5 meters and are 5.5 meters high. Jongia's sixteen agitators each consist of an approximately 4.5 meter long shaft with four propellers at the bottom. The shaft is only fixed to the gearbox at the top and otherwise ‘floats’ freely in the mass. Bart Brouwer: “Digesters are usually round. This is not a problem with a rotating agitator. But these bunkers have a different shape. In addition, each of these bunkers has several concrete columns that support the roof. This makes designing the right agitator a special challenge. We have investigated this extensively and devised a customized solution with two agitators per bunker. To validate our solution, we engaged an external company to perform CFD (computational fluid dynamics) modeling and analysis of the flow profile and velocities. This independent validation gives the Smits Group confirmation that the agitator and bunkers do what is expected.”

Jongia has conducted extensive research into the optimal placement of the agitators. An external agency subsequently validated this research. This image shows the speed of the flows in the fermentation bunker.



App or cloud

The agitators do not run continuously, but can be switched on and off as required and independently of each other. The controls are located in a control cabinet, but can also be operated remotely via a mobile app or even via the cloud. “Modern technology allows us to work extremely flexibly,” says Pieter Smits. “We can adjust production to the desired needs at any time.”



The agitators were assembled on site...



...and lifted into place with a crane.



Above: The propellers of the agitators.



Right: The agitators are lifted to the roof of the fermentation plant by a crane.

Below: Technicians ensure that the agitators end up in exactly the right place.



Expansion

Jongia's new agitators with NORD drives have been running since the end of 2023, and the Smits Group is satisfied with the result so far. Pieter Smits: "We want to add a second installation with another eight bunkers in the future. This allows us to significantly increase our capacity and enable us to supply an even greater volume of green gas to the grid. This also means repeat orders for our suppliers."



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