

Case story | VACON® 100 X AC drive

# Controlling a paddle agitator to turn waste into biogas

Turning organic waste and raw materials into biogas is an environmentally friendly act. Using technology that optimises the process and makes it energy efficient strengthens the green values. VACON® 100 X AC drives control paddle agitators designed by Thöni in Austria.

Thöni is a multi-business, family-owned company operating globally and headquartered in Telfs in Tyrol, Austria. One of their lines of business is

developing turnkey solutions for biogas plants.

A key component in the process of turning waste into biogas is a specific paddle agitator invented and developed by Thöni. It is used for stirring and mixing agricultural substrates. However, just stirring and mixing is not sufficient. During this dedicated process, the paddle agitator executes a fundamental functionality:

it creates optimal conditions for the micro-organisms to work effectively. Distinguished by its sophisticated stirring geometry and robust construction, Thöni's patented paddle agitator is able to move large volumes so efficiently that the substrate is optimally mixed, no floating layers arise and a high gas yield is ensured. It is also very energy efficient: it consumes 50% less energy than a propeller agitator.



## To get the hang of the process with VACON® 100 X

Dependability and energy efficiency are central values for Thöni. Using an AC drive to control the speed of an electrical motor meets both values. For turning the paddle agitator to ensure its optimum operation in an energy-efficient way, Thöni chose a VACON® 100 X AC drive.

The VACON® 100 X also meets the general requirements regarding installation outdoors. It is designed to provide peak performance in a demanding environment in a power range up to 37 kW. The VACON® 100 X is suited for decentralized installation and is able to withstand a wide range of temperature variation (-40°C to +60°C), and has a robust IP66/Type 4 Outdoor enclosure of die-cast metal. This ensures protection against aggressive fermentation gas as well as vibrations created by the paddle.

Thöni was also convinced by the wide scope of functions of the drive.

Communication via the PROFINET IO protocol is easy thanks to the integrated Ethernet interface. The modular structure of the drive also enables any other bus protocol to be supported. This is very important as sometimes also Profibus is used for communicating with the overriding logic controller.

Thöni also uses the VACON® 100 X with a customized functionality for controlling a greasing pump to ensure lubrication of the bearings. VACON® AT designed this functionality with the help of the inbuilt Drive Customizer. Selected supplier since 2013

*"We were previously familiar with Vacon and the VACON® NXL drives. When we heard about the VACON 100 X through the media, we contacted Vacon AT based in Leobersdorf, Austria," explains Urban Zell, Head of Electrical Engineering, Environmental/Energy Engineering, Thöni.*

"Soon thereafter we started the first tests with the support of VACON® AT's engineer to operate the paddle agitator with the VACON® 100 X. This was the first step in our cooperation; since 2013, VACON® AT has been our selected supplier of AC drives for our paddle agitators."

Serving customers and listening to their needs is close to VACON® AT's heart. "We were able to meet all the requirements Thöni had and made a unique solution no other supplier was able to provide. This makes us glad! Now we supply the drives for Thöni, and they handle the rest, for example the installation and commissioning of the drives. VACON® 100 X drives are already controlling several of Thöni's paddle agitators. One installation is in Staßfurt in Sachsen Anhalt, Germany," relates Johann Wetzel, Vacon AT.

This case story was originally released before the merger of Vacon and Danfoss Power Electronics was fully completed on 15 May 2015. As a result, Vacon as a company brand no longer exists and contact persons mentioned in the story may have changed. Future case stories on VACON® products will be released on behalf of the new organization – Danfoss Drives – which is part of the Danfoss Group.



VACON® 100 X installed outdoors. To turn the paddle agitator and ensure optimal operation, a VACON® 100 X AC drive and an automatic central lubrication unit are used.

Photos courtesy of Thöni.

