



HIGH-TECH IN THE COW STALL

Innovative milking robot with automation from Bachmann

Robots are increasingly being used for daily tasks in dairy farming. This obviously reduces the work for the farmer. However, it also gives the cows as natural a life as possible: For example, the use of milking robots enables them to determine the milking time for themselves. BouMatic Robotics from Emmeloord, Netherlands, develops and produces the relevant systems and relies here on the automation system from Bachmann electronic.

The Dutch company, BouMatic Robotics, has specialized in the development of robots for dairy farming. It has gained its knowledge of all aspects of dairy farming from its affiliate US company BouMatic, which has more than 80 years of experience in this field.

Successful with a special technology

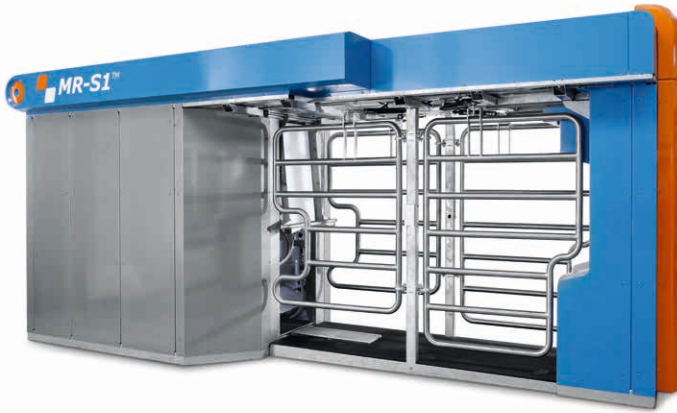
"BouMatic has been producing huge rotary milking systems for the automatic milking of cows for a long time. Everything beyond the actual milking process, however, was

previously done by hand," explains Ebel Hidding, responsible for development, sales and services at BouMatic Robotics. "We considered how we could change this." The development of the first prototypes showed that the field of robotics is a completely separate area which presents applications in the dairy industry with completely new challenges in terms of development and service. BouMatic Robotics was therefore founded in April 2011. "We first of all launched a spray robot on the market, which cleans and disinfects the teats of the cows before and after milking in ►►



The Dutch company BouMatic Robotics B.V. specializes in robotics in the dairy industry. It was founded in 2011 in order to bring together the experience of its affiliated company BouMatic in innovative milking robotics. The robot systems are developed, produced and assembled at the company's headquarters in Emmeloord.

► www.boumaticrobotics.com



▲ The US affiliated company BouMatic has decades of experience in the dairy industry. BouMatic Robotics uses this for the development of highly innovative milking robots.

▶▶ order to prevent inflammation," Ebel Hidding recalls the beginnings. Directly afterwards, the first MR-S1 milking robot and the MR-D1 for two cows were presented.

Maximum functionality for the entire system

"The idea behind the milking robots is actually quite simple," Ebel Hidding states. "The cows come to the milking stand of their own accord since they know that they will be relieved of the pressure from the milk and will naturally also get fed." The gate closes and the robot identifies the cow by means of a transmitter on the cow's neck band. It is first determined whether milking is at all necessary at this

time. "If the process can start, a robot arm moves underneath the cow from the rear. This cleans the cow's teats automatically as well as placing the teat cups on the udder, performing the milking and subsequent disinfection," Ebel Hidding describes the process. "The gate then reopens and the cow is happy," says Ebel Hidding with a smile.

Varied tasks

However, the technical effort behind this concept is enormous. BouMatic Robotics developed the robot arm itself: Besides horizontal and vertical movements, it also performs rotations, since the teat cups hang with the opening facing downward in the milking stand for hygiene reasons. The greatest challenge was the fitting of the teat cups. This requires maximum precision. "Naturally, not every cow is the same, and the udders can point in very different directions," Ebel Hidding explains. First of all, the position of the legs and the udder is determined using a camera and the result compared with the database in which the teat coordinates of the cow are also recorded. A 2D camera and laser technology are then used to find the exact position of the teats.



▶ Today Boumatic Robotics uses three imaging systems to precisely locate the position of teats.



▲ The SR-1 spray robot precisely cleans the udder of the cow straight after milking and prevents the growth of infections. The robot is integrated in the rotary milking system, but functions completely independently.

The milk is continuously analyzed during the milking process. In this way, it is immediately possible to separate any milk that is contaminated with blood. "In addition to this, we have to separate the milk from cows that have been given medicine. Or if a cow has just had a calf, we need the colostrum for it," Ebel Hidding describes some of the factors that have to be taken into account.

» **The controller from Bachmann is robust, fast and reliable.** «

*Ebel Hidding,
Development, sales and service*

Fast, robust and reliable

In order to manage the varied tasks of a milking robot, a reliable and robust automation solution is needed at the core of the system. "We had already relied on Bachmann for the spray robot. We were totally impressed and so we also used the Bachmann automation system for our milking systems," Ebel Hidding confirms. "The Bachmann controller is robust, fast and reliable," Ebel Hidding emphasizes the benefits. "As the robot arm performs

only minute and precise movements in a very short time, the automation also has to offer a high level of performance. With the Bachmann controller this is not a problem."

Promising future

BouMatic Robotics develops all the components for its robots itself: "For the automation we need an open system with all the necessary interfaces, as provided by Bachmann's controller," Ebel

Hidding confirms. "It can be programmed in C++ and we can make adaptations at any time." New functions could thus already be added to the development of the MR-D1, by which two cows can be milked simultaneously. The developers at BouMatic Robotics are happy. "The Bachmann automation system meets our requirements perfectly. In future it will thus also allow us to develop innovative robots that operate reliably," a delighted Hidding states.