

# DRIVE SOLUTIONS FOR MALTING PLANTS

CASE STUDY: MOPOS



Latest generation drives for turning machines in the box malting plant.



Continuous duty operation.



100% humidity.

Acid-resistant drive units.



UNICASE parallel shaft gearboxes with smooth surface motors controlled by NORDAC *PRO SK 500E* inverters.



#### FOOD INDUSTRY Malting plants



#### GEARED MOTORS Parallel shaft gear units with smooth surface motors.



#### FREQUENCY INVERTERS NORDAC PRO SK 500E

### PROJECT REQUIREMENTS

**Hops and malt.** – Cold beer is essential for almost any social gathering. The taste of the beer is determined by the malt which is added. Various flavor nuances are created in a complex production process by machinery in continuous operation. One of the Czech Republic's leading manufacturers of malting equipment is Moravské potravinářské strojířny, abbreviated as MOPOS. For one of their customers, MOPOS replaced the malting plant turning machines and the corresponding drive units in 2015. During the entire production process, the machines turn the grain in enormous troughs called Saladin boxes.

**Durability required.** – Smooth operation of the malting process requires durable drive technology, because the malting process takes several days for each batch. The machinery is in continuous use for many years.

**Steam Production.** – The barley first has to be moistened so that it can germinate. The next step is a series of drying stages. This results in a production environment with a humidity of 100%. For operation at the condensation limit, the mechanical components require special corrosion protection and the electrical components require special insulation.

**Acid-resistant housing.** – The carbon dioxide which is produced during drying can slow down the malting process. Because of this, it is extracted during drying. When it escapes into the operating environment it reacts with the steam.  $H_2CO_3$ , is continually produced, which acts on the machines. NORD drive units with smooth, self-draining surfaces and special surface protection systems offer the optimum solution for such demanding environments.

### CUSTOMER PROFILE



Moravské potravinářské strojířny, a.s. Olomouc, abbreviated as MOPOS, is one of Europe's leading machinery manufacturers. In the food industry, the Czech company is regarded as a trendsetter for state-of-the-art production lines and complete manufacturing plants, especially for the malting and bakery industries. At present, more than 120 employees generate an annual turnover of more than 7 million EURO.







## APPLICATION SOLUTION

**Weatherproof equipment.** – The MOPOS malting plant's turning machines are each equipped with 14 parallel shaft gear units. To ensure reliable operation in this special operating environment, these drives were provided with a special surface treatment that protects the smooth surface of the machinery against both the ambient atmosphere as well as against the high pressure jets of chemical cleaning agents. Thanks to the washdown design, these liquids drain off quickly and completely. The drives are protected with a high quality, chemical resistant paint system. Because they are installed vertically, the gear units only offer a small exposed surface.

The energy efficient NORD electric motors were designed with protection class IP66 to withstand the very high humidity; the temperature sensors and terminal boxes

were encapsulated in resin and a moisture-resistant insulating paint protects the rotors and stators.

**Stay cool.** – Multi-stage NORD parallel shaft gear units move the machine's 23 foot wide drive unit weighing more than 16,535 lbs. Constant cooling is required. Due to the highly acidic humidity and the controlled movement of air for the process, fans were not an option. Instead, the drives are cooled entirely via their surfaces.

Thanks to a high reduction ratio in the gear units, the 8 turning machines travel on rails across the 174 foot long and 6.5 feet deep Saladin boxes at a moderate speed. NORDAC *PRO* SK 500E series frequency inverters control the speed changes of the motors during the various phases of the malting process.



**Traveling drive.** – The UNICASE parallel shaft gear unit with a helical gear first stage moves the turning machine across the Saladin box.

## THE PROJECT AT A GLANCE

To cater to the special ambient conditions, MOPOS equipped the 8 turning machines with 112 parallel shaft gear units with smooth surface motors and 8 state-of-the-art travel drives. The components used are extremely corrosion resistant. NORDAC *PRO* SK 500E series frequency inverters enable motor speeds which are matched to the various phases of the malting process.





Malt house turner with 14 drives and traveling drive



Continuous operation at condensation level

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