

# DRIVE SYSTEMS FOR MALTING PLANT

CASE STUDY: MOPOS



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



Continuous operation.



Acid-resistant drive units.



Parallel shaft gear unit block with smooth motor controlled with NORDAC *PRO SK 500E*.



#### FOOD INDUSTRY Malting plant



#### GEARED MOTORS Parallel shaft gear with smooth surface motor.



#### FREQUENCY INVERTERS NORDAC PRO SK 500E

### PROJECT CHALLENGE

Hops and malt – cold beer is almost essential for a convivial gathering. The taste of the beer is determined by the malt which is added. Countless nuances of taste are created in a complex production process for which the machinery is in almost continuous use. One of the Czech Republic's leading manufacturers of malting equipment is Moravske potravinarske strojirny, abbreviated as MOPOS. For one of its customers, it replaced the malting plant turning machines and their drive units in 2015. During the entire production process the turning machines turn the grain in enormous troughs, so-called Saladin vats.

**Stamina 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.

**Production with steam.** – 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. If 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 production environments.

### FOCUS ON THE CUSTOMER



Moravské potravinářské strojirny, 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 turning machines of the MOPOS malting plant are each equipped with 14 parallel shaft gear units. These were provided with a special surface treatment to ensure reliable operation in this special operating environment. This protects the smooth, ribless 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.** – The machine is moved by a 7 metre wide and more than 7,500 kg drive unit with multi-stage NORD parallel shaft gear units. This requires constant cooling. 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 at a moderate speed on rails above the 53 metre long and 2 metre deep saladin vats. NORDAC *PRO SK 500E* series frequency inverters control the speed changes of the motors during the various phases of the malting process.

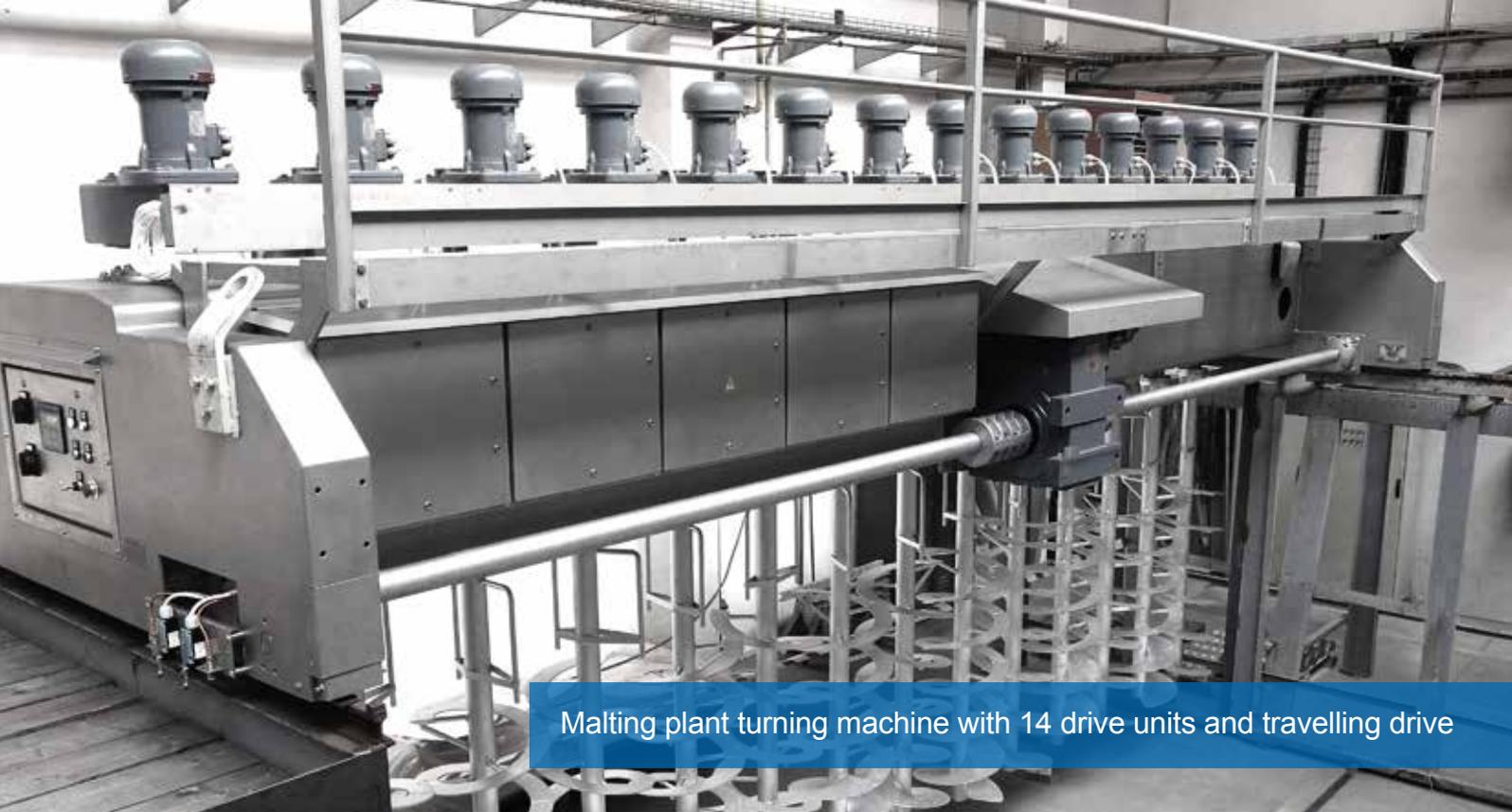


**Travelling drive.** – The BLOCK parallel shaft gear unit with helical gear first stage moves the turning machine over the saladin vat.

## FOCUS ON THE PROJECT

To cater for the special operating environment, MOPOS equipped the 8 turning machines of this malting plant with 112 parallel shaft gear units with smooth motors and 8 state-of-the-art drive units. The components which are used are extremely well-protected against corrosion. NORDAC *PRO SK 500E* series frequency inverters enable motor speeds which are matched to the various phases of the malting process.





Malting plant turning machine with 14 drive units and travelling drive



Continuous operation at condensation level

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