

Short Proving Times

Machines Knead Dough



Roman bakeries were already using simple dough kneading machines around 400 AD. A forerunner of the modern dough kneader dates back to 1850. Diosna, a leading company for bakery machines in Europe, presented its first dough kneading machine in 1911. These machines shorten the time required for the dough to prove. Kneading separates the flour particles that are stuck to each other so that water can be adsorbed. This process determines the quality of the starch agglutination process during baking. Dough temperature increases 1K/min during kneading due to rubbing and so short kneading times are advantageous. With its innovative kneading machines, Diosna consequently uses innovative Moeller components, such as the PKZ motor-protective circuit-breaker, the new generation of xStart and DILM contactors and N switch-disconnectors.



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INFO

The Company: www.diosna.de

Products: RMQ control circuit devices
PKZ motor-protective circuit-breakers
DIL contactors
P5 switch-disconnectors

Quicklink ID: MS1908 [www.moeller.net]

DIOSNA Dierks & Söhne GmbH was founded 120 years ago in Osnabrück as a company involved in machine building. Today it produces machines for the baking and food industry as well as for the pharmaceutical and chemical industry. Its development into a leading company for baking machines included two takeovers, in 1994 the takeover of OASE Pumpen Wübker Söhne

GmbH & Co and in 2001 the takeover of BOKU Maschinenfabrik GmbH. In addition to dough kneaders for baking, mixing plants for industrial bakeries, lifting and emptying stations, as well as kneaders and mixers for large kitchens, meat processing plants and other food manufacturing companies. Diosna is also a system supplier for chemical and pharmaceutical plants.

Depending on the process involved, the mixers are either stirrers for liquids, i.e. highly viscous media, and kneaders for low viscosity mixing material. The current dough kneader types are spiral, Wendel, L-shaped and eccentric worm kneaders for continuous kneading. As with most machines, the electrical equipment of a state-of-the-art kneader consists of a control system that is integrated in the switching area of the machine or in a separate switch cabinet, as well as HMI devices and sensors. Each control system requires protective devices for their function, in this case, PKZ motor-protective circuit-breakers and power actuators such as motor contactors for the drives. The main drive of a kneader or kneader arm is designed in the standard version for two speeds. The startup is always completed via a star/delta circuit at a low speed in order to provide a high torque during the startup. Four motor contactors are therefore needed for the main drive. Diosna uses here Moeller's DILM series that are now available in a new generation and have been completely updated. The two auxiliary drives for tub and hydraulic pump are started directly and therefore require two more motor contactors.

Next generation - xStart contactors

The new generation of xStart contactors stand out for the extremely low heat dissipation of their coils, their compact and identical dimensions for AC/DC versions and seamless DC actuation at 24V 50mA. The low sealing power of the contactors allows a higher packing density and enables the use of smaller power supply units for the control current. This firstly optimises the space requirements in the switch cabinet and secondly reduces the heat that has to be removed by means of fans or climatic units.

xStart switching devices replace conventional wiring with pluggable main and control current connections. While motor starters were previously connected with cumbersome cables or bridges between motor-protective circuit-breaker and contactor, contact is now implemented by means of mechanical plug-in modules – they combine motor-protective circuit-breakers and contactors into stable units. The tool-less connection technology offers fast and error-free wiring without the need for any tools.

xStart contactors offer other practical features in the series. For example, grooved contact surfaces with eight contact points ensure reliable contacting with auxiliary contacts, even with small loads. Motor filters and other auxiliary contacts, as well as accessories can be plugged onto the contactor from the top, and all the required openings are perfectly enclosed. Electronic circuits created by the user can also be positioned on the contactor using solder pin adapters.



Load-break switches offer flexibility

The main switch function with Emergency-stop functionality according to IEC/EN60204-1, VDE 0113 Part 1 is implemented with Moeller P5 and T6 switch-disconnectors, depending on machine rating. When the switch is disconnected, all main and auxiliary contact circuits are isolated by means of the undervoltage release with two integrated early-make auxiliary contacts. The proven spring switch system in the circuit-breakers ensures reliable switching of the switch-disconnectors under load. The switch can be mounted vertically or horizontally in the switch cabinet and can be switched easily with an ergonomically designed door coupling handle. The side wall operator also allows the switch to be operated from the left or the right hand side. The optimised mounting bracket for the load-break switch fully utilises the space in the switching cabinet. The wide range of connectivity products for round conductors with and without cable lugs, laminar copper strips or copper busbars offers a high level of flexibility and economy, depending on the different performance classes of the kneading machines concerned.

CONCLUSION

According to Dr. Theo Koch, head of sales at Diosna, kneading technology is an essential factor in efficient baking: "In earlier times kneading was hard work. Nowadays this is carried out with machines that also increase the quality. We are using Moeller components in our process lines and individual kneaders because we need a technology that is as innovative as it is robust and reliable. DIOSNA is continuously developing machines that take customer requirements into account. DIOSNA machines set new standards and are state-of-the-art, and so all the components used must meet these requirements as well."