

Compliance with safety regulations through active energy management

# PxTRX active energy manager separates plastic smoothing rolls despite power failure

Safety regulations for flatfilm and sheetlines require the smoothing rolls to be moved apart by at least 30mm in the event of a power failure. In order to comply with these safety regulations and to additionally prevent the rolls from sticking to the hot plastic film, an energy source is required that enables the rolls to be moved apart without any problems. The solution for this are the active energy management devices for electric drives from Michael Koch GmbH.

## Ensuring machine safety

In the production of modern films and sheets, such as food packaging (margarine, drinking cups, microwave trays, etc.), medical packaging (barrier films), office films (file covers), etc., certain safety regulations must be observed. For example, the regulation DIN EN 12301 for plastics and rubber machines, so-called calenders, requires compliance with certain safety opening distances and opening speeds. If

an emergency stop occurs, the rolls must move apart. This is to ensure that neither the machine nor the employee, who is in danger, comes to any harm. The German machine builder Kuhne offers, among other things, customized flatfilm and sheetlines for a wide range of applications. To comply with the DIN EN 12301 directive, Kuhne uses the PxTRX active energy management devices for electric drives from Michael Koch GmbH based also in Germany. In the event of a power



The PxTRX active energy management device from Michael Koch GmbH for electric drives:  
Ensures controlled stops.

failure, the PxtRX energy managers immediately return the previously stored energy to the machine, making controlled stops and compliance with safety regulations uncomplicated at all times.

### Controlled stops and smooth restarts

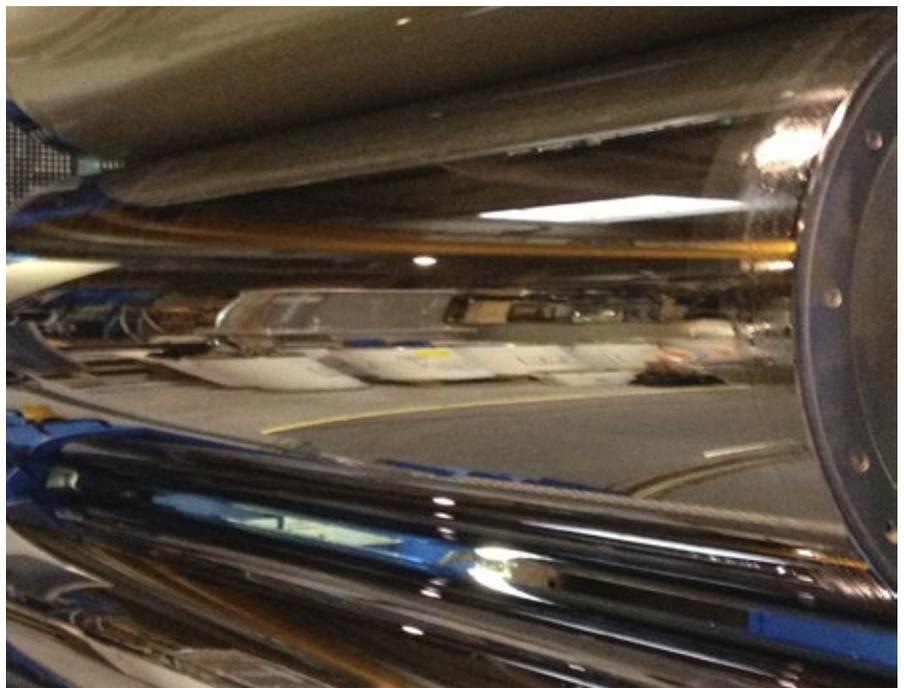
The PxtRX ensures that the rolls quickly move apart to the required safety distance, so that there is no damage to man, machine or the workpiece. The machine manufacturer Kuhne is dealing with machines in which the rolls are operated constantly - i.e. not dynamically. The complete power therefore only has to be buffered in a few exceptional cases. However, if these situations occur, everything has to happen very quickly and reliably so that no damage occurs. The lower roll is less of a problem here, since on the one hand it can be moved downwards by its own weight. However, since the infeed takes place via motor-driven spindle lifting elements, energy is still required to move the rolls apart. In this case, it is precisely the lower roll that is the most important element, since in conjunction with the roll fixed above it, it forms the infeed gap where the plastic melt is applied to the calender. Since hydraulic solutions are inconvenient, Kuhne looked around for alternatives. Kuhne quickly came across the easy-to-connect plug-and-play solution PxtRX from Koch, the specialist for energy management of electric drives.

### Customized design

If the power supply from the mains fails, the machine requires power immediately for a short time. In the customized application engineering, Koch started from the given scenario and calculated a peak power of 20 kW for the network of frequency converters used. The en-

ergy required is 100 kJ for a short period of 5 s to bring the rolls to a controlled stop - and in such a way that it runs smoothly for both machine and man.

In this application, the active energy management device respectively complete system consists of 3 PxtRX energy management devices and 3 PxtEX storage units. With this solution, Koch ensures that the required energy



Despite the lack of power supply, in the event of a mains failure, all rolls are supplied with the necessary energy to bring the line to a controlled stop with the required roller gap, thanks to Koch's active energy management system.

of 100 kJ is constantly available. Despite the lack of power supply, in the event of a mains failure, the lower roll is supplied with the necessary energy to bring the machine to a controlled stop, thanks to Koch's active energy management system. After the energy from the mains is available again, the machine must be restarted. By opening the roll nip, it is then positioned again at the previously set roll nip, meaning the previously set material thickness. At the same time, Koch's active energy management system is gently recharged for the next power failure so as not to overload

the charging connection of the frequency converter system.

### Connection between storage and frequency inverter

Frequency converters or servo controllers are the commanding entity in an electric drive system. Since such devices first convert the alternating current from the mains into direct current and then into the appropriate alter-

nating current for the motor, they are called frequency converters. Subsequently, this "converted alternating current" then generates the desired direction and speed in the drive. The management of the energy level or balance is therefore of great importance for the functionality of the inverter. This is precisely where Koch's active energy management system comes in.

The PxtRX is the heart of the whole system and the active link between electrical storage units and the inverter's internal DC-network. In every situation, it

ensures that the optimum power is available over time. And it does so in both directions: Driving or braking.

### The application decides on the storage medium and sizing

If the frequency converter is no longer sufficiently supplied with energy due to the mains failure, the PxtRX takes over this function and keeps the drive running from its storage devices according to the defined specification. In the application described, double-layer capacitors are the most suitable storage medium. In other cases, storage media such as batteries or electrolytic capacitors can also be used. The application requirements in terms of performance and time duration are decisive. The active energy manager PxtRX masters the energetic tasks and the corresponding storage types equally well.

Furthermore, the PxtRX neutralizes voltage fluctuations as well as unplanned or also planned mains interruptions. In the application described, the active energy management systems from Koch thus surprisingly simply ensure what the smoothing rolls need to perform their tasks even in the event of a voltage dip: The necessary amount of energy that is always appropriate. A relatively small investment in an active energy management system pays off in a short time in view of the avoidable failures.

Koch's experienced sales team puts together the configuration for the specific application and delivers it complete with storage units. In close cooperation with the customer Kuhne, the final system configuration was determined on the basis of various scenarios that were extensively studied and analyzed. In the specific case, the requirements that the smoothing rolls come to

a controlled standstill in the event of a power interruption, that safety regulations are complied with, and that they then start operating again without any problems are met in every situation.

### Plug & Play at its best

The energy management devices are delivered in such a way that they only need to be electrically connected on site during instal-

lation and they are ready for operation. This means that neither time-consuming commissioning nor programming is necessary. Long story short: real plug & play! In addition, the operation of Koch's active energy management devices is maintenance-free. However, if a problem should unexpectedly arise in the system or in a component, the PxtRX will alert you to possible upcoming risks in an Industrie 4.0-compliant manner.



## What we offer:

- Tested product quality
- Certified processes
- Individual application support
- Machine specific design and sizing
- Rapid reaction
- Quick delivery times
- On-time delivery
- Reliable partner
- Long-term business relationship
- Direct customer relations

Use our communication channels:



## Your specialist for:

- Active energy management devices and systems
- Safe braking resistors

We look forward to hearing from you!



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