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**Economizer –
Reduce operating costs and
create free capacities**

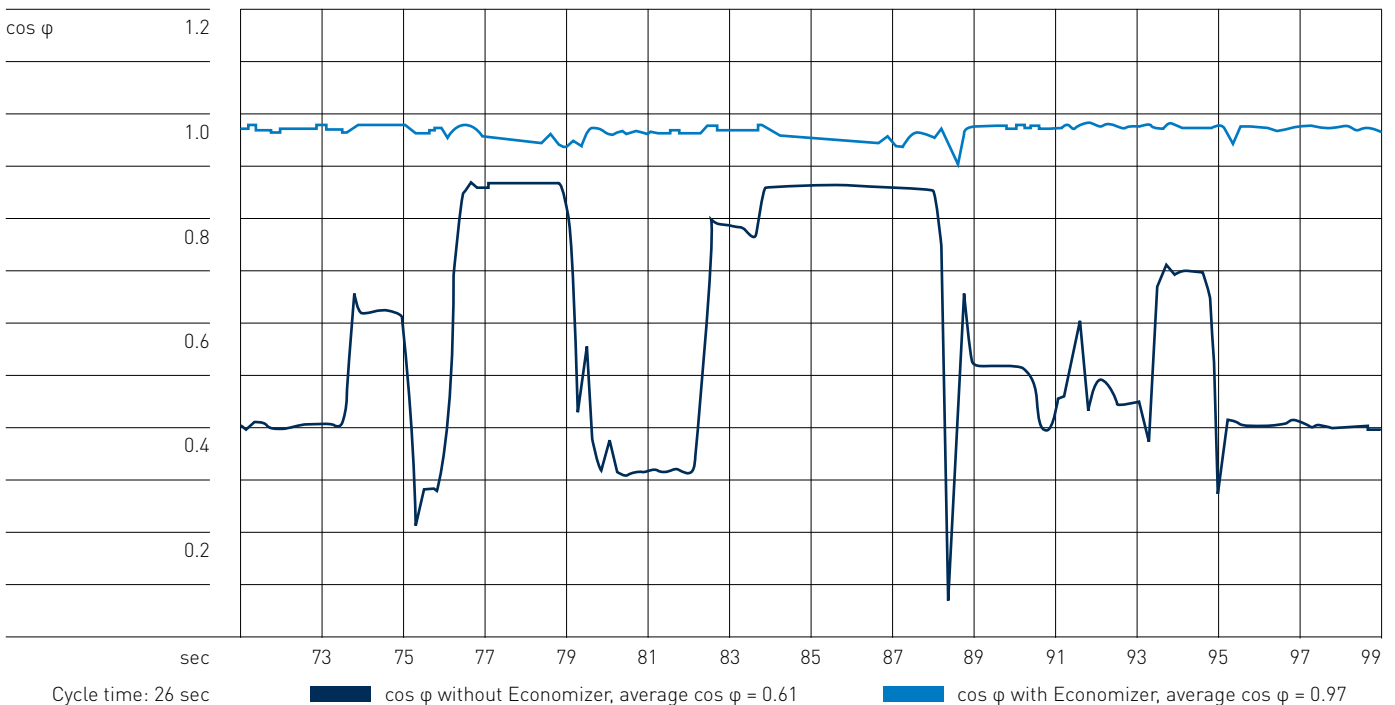
Engineering Passion

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Dynamic power factor correction

Free capacities and cost reduction in the electric energy supply

Comparative measurement on an injection molding machine with 55 kW drive power



Three-phase motors require reactive current for establishing magnetic fields. Particularly in injection molding machines, these reactive currents occur due to the fast and extreme load changes of the drives with strong fluctuations. Here, dynamic power factor correction is a tried-and-tested solution for increasing efficiency.

A fully electronic control system is used to activate the individual capacitor levels for compensation depending on the load. In this way, average values of up to 0.97 are achieved for the power factor $\cos \varphi$.

Reduce energy costs

The future procurement price for the electric power is defined in the power supply contracts. This price consists of various rates, for example for provision and grid access.

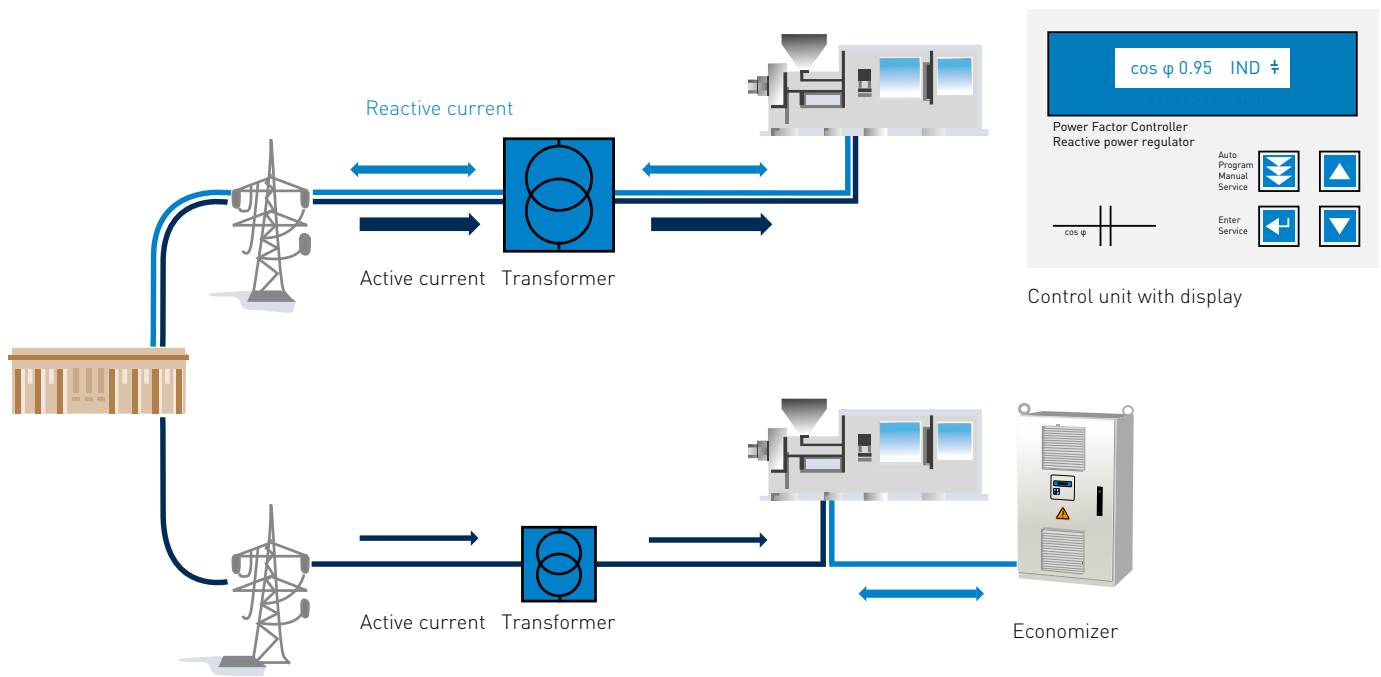
The apparent power is the most important basis for these calculations. Thus, a reduction in apparent power by the percentage of compensated reactive

power benefits the future energy price. The lower peak currents also improve the load profile and provide cost savings in the monthly electricity bills for actual consumption. The costs for reactive power to the energy provider can be largely avoided using dynamic compensation.

Reducing thermal stress

The high power factor ($\cos \varphi$) gives some indication of lower network losses, decreased current load and reduced thermal stress. These factors allow all electric components in the network to benefit from longer service life.

More efficient energy supply through power factor correction using the Economizer



Use transformer power effectively

The configuration of the required transformer power is based on the installed apparent power of the consumers. If the percentage of the reactive power is reduced here, more remains for the effective power.

For instance: An increase of the $\cos \varphi = 0.65$ to 0.95 through dynamic power factor correction leads to a 31% reduction in the apparent power rating of the transformer. In a 100 kW three-phase motor, this would allow an additional 45 kW to be connected to the transformer under the same requirements.

Cable network provides free capacities

The compensation of reactive power directly on the motor increases the available network capacity by 30% or more. This enables existing power supplies to avoid costly and extensive network upgrading when installing additional consumers. The advantage of reduced apparent power for new installations is that supply lines can be dimensioned at a more affordable price.

Avoiding unnecessary power losses

Reducing the reactive power also reduces network losses. Reduced line losses in the power supply line due to reduced heat buildup and reduced effective power losses at the transformer translate to absolute energy savings.

Your benefits:

- Reduced energy costs
- Transformer power with free reserves through improved $\cos \phi$
- Cable network with additional capacity of over 30%
- Reduction of network (line) losses and peak currents
- Autonomous unit, easy installation without interference in the machine control system
- Product range for motors of 11-260 kW for nominal voltages of 380-420 V 50 Hz and 440-480 V 60 Hz

Economizer – Reduce operating costs and create free capacities

The Economizer is installed directly on the motor of the injection molding machine. Through quick electronic switching of the capacitor levels, it compensates the reactive current dynamically and autonomously. This significantly reduces the apparent power to the effective power, thereby reducing energy bills. Simultaneously, free capacities are created immediately in the internal power supply and at the transformer station.