



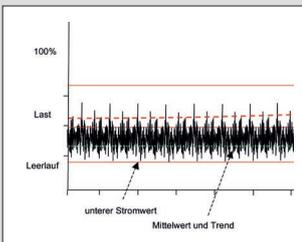
energy and efficiency

energy control systems by Dr. Tanneberger GmbH – partner for power optimisation, power-based production planning and avoiding breakdowns in key drive systems

ISO 50001



„ This is how we could melt part of our energy costs at Siemens – with an ROI in under 1 year! “



NEWS

New development:

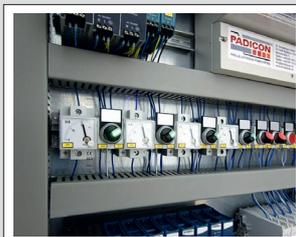
The „power ECG“ by Dr. Tanneberger



SUCCESS STORIES

References:

Reduction in peak capacity



PRODUCT PORTRAIT

It has proved itself:

Practical experience with PADICON®

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Dr. Tanneberger GmbH

energy-control-systems



Siemens uses Dr. Tanneberger!



As the leading supplier of industrial drive components, Siemens Gusstechnik GmbH [casting technology] from Chemnitz manufactures couplings, wheel set and oil supply systems for universal standard gear units. Manufacturing these products requires a considerable amount of energy. The peak capacity when calculating energy requirements is of great importance for these kinds of production processes. Exceeding the fixed maximum power often leads to significant additional costs. To correct

this, a patented energy control system was installed at Siemens Gusstechnik GmbH. The Dr. Tanneberger parallel difference power control PADICON[®], which is based on trend values, intelligently controls the power supply and guarantees an even production process. The cost savings and the production optimisation that the system has given the company are explained in an interview by Uwe Junghans, head of maintenance/investment planning.

Which particular problems and tasks needed to be solved in the production area of your company by the PADICON[®] system?

The PADICON[®] was another huge step in terms of energy optimisation for us. The parallel difference power control system is used in the furnaces. The heart of the PADICON[®] is the Tanneberger IBK 800 which we were already using before and has now been further developed to control of the furnaces directly. The main concern was that to reduce the peak, this is a huge money factor. Above all, by using the PADICON[®], we wanted to use an intelligent alternative for the classic load shedding approach of conventional control of furnaces.



What effect does the PADICON[®] have on the production process?

The deciding advantage is that a trend is calculated as with the conventional load shedding circuit, but it is a lot more precise. This way, we don't have to switch off the furnace using load shedding whereby the affecting delay times are omitted technologically but it is aimed to shut it down parallel with the system. We can supply energy to individual furnaces in seconds using a priority circuit so that we can keep to the technological guidelines in order to complete batches on schedule. We chose the furnace which has priority using the priority circuit and the other furnaces are automatically lowered. Before, unproductive delay times have to be included because the trend calculation didn't predict for how long the furnace had to be switched off due to safety reasons. Parallel control of the furnace also provides the advantage that in theory, you can switch from one furnace to another every second. Expensive heater and waiting times are now a thing of the past for us thanks to the PADICON[®].



Uwe Junghans
Siemens
Gusstechnik GmbH

”PADICON® paid off after one year.“

Balancing power fluctuations and increased energy efficiency were surely the main reasons for working with PADICON®. Have you discovered any additional positive aspects about it?

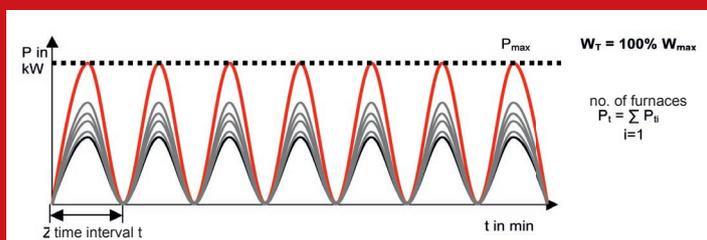
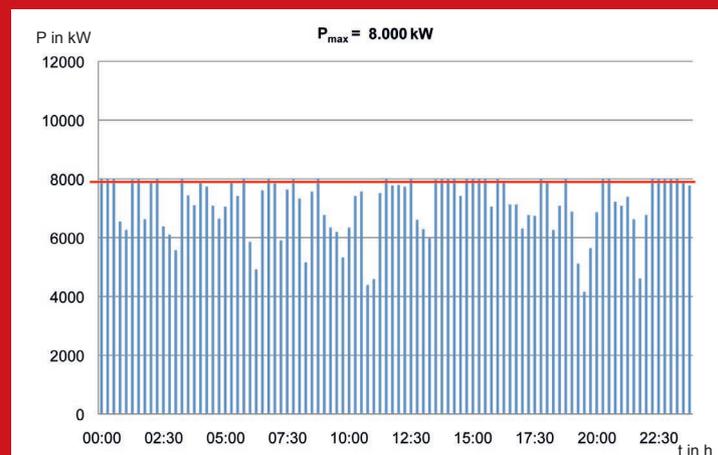
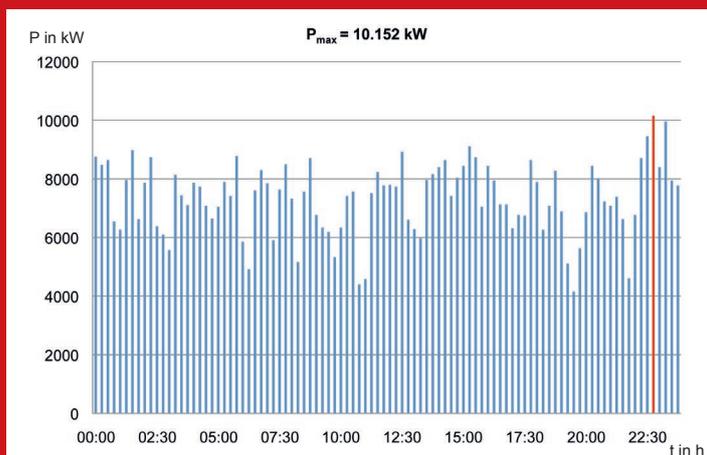
From the IBK 800, which precedes the PADICON®, we can draw conclusions in terms of the entire operating process and restructure the technological processes in order to achieve an optimum in terms of energy processes. The PADICON® itself is a self-sufficient unit which controls our furnaces. With the IBK 800, other energy sectors are also monitored in our company.

For example we can analyse our gas and water consumption.

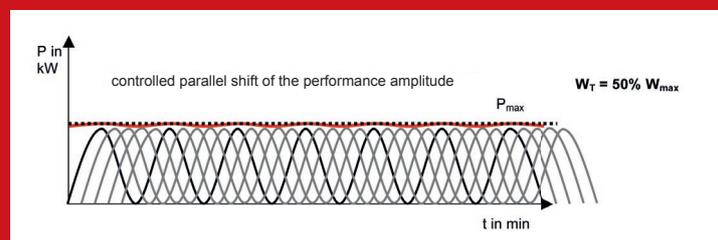
These factors can also be adjusted with the IBK 800 using free inputs and outputs. The control of the figures and the consumption is the advantage for us to be able to diagnose big leakages in time.

How much lower was the peak when using PADICON®?

With the PADICON® system, we could succeed in reducing the peak by 2 MW. We used to consume approx. 23 MW maximum power and now we operate with 21 MW power.



Performance not harmonised, multiple incidental simultaneity of the performance, schematised (e.g. melting plants)



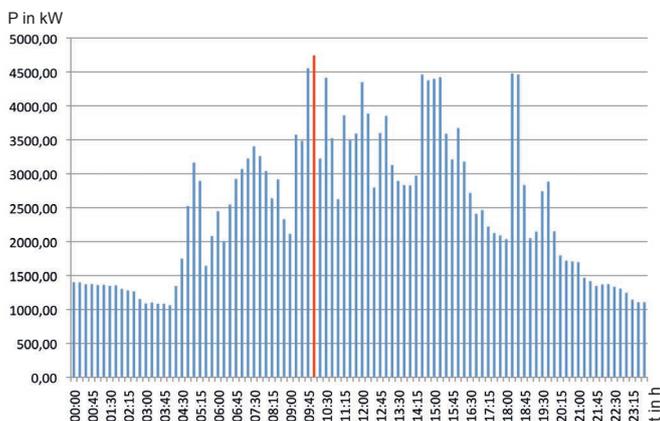
Harmonised and schematised performance (e.g. melting plants) using PADICON® parallel difference power control, schematised



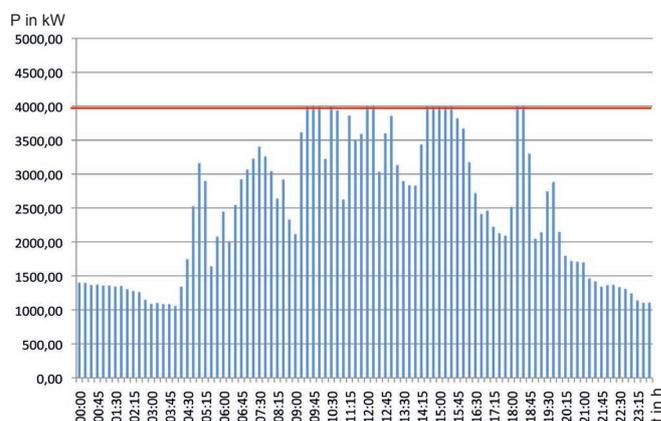
Make short shifts with high costs: PADICON[®]

With power-based production planning, operate at full power and still reduce costs.

A patent is pending for the PADICON[®] system and it has been approved by the TÜV RHEINLAND as well as many other reference customers. With PADICON[®], savings in energy costs of up to 20% can be made by avoiding cost-intensive peak consumption. Flawless monitoring reveals weak points and potential for improvement in production so that the work process improves and energy efficiency can be increased significantly.



output without optimising performance (electrically) in two-shift company



output after optimising performance (electrically) with PADICON[®]

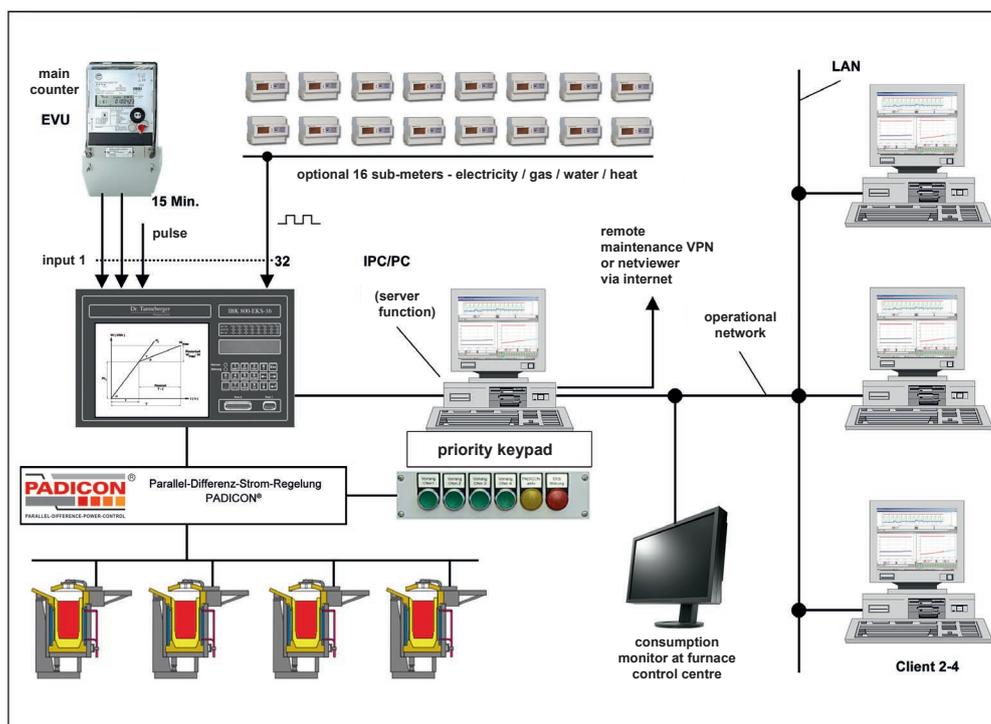
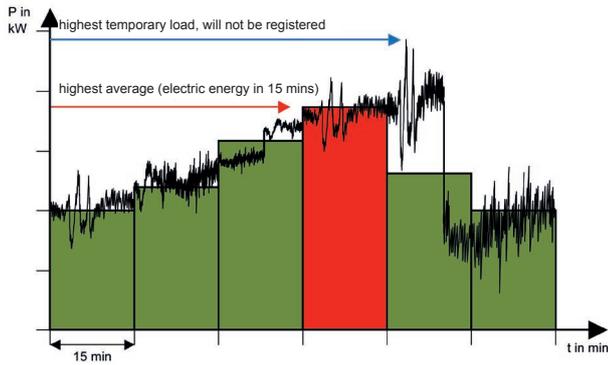


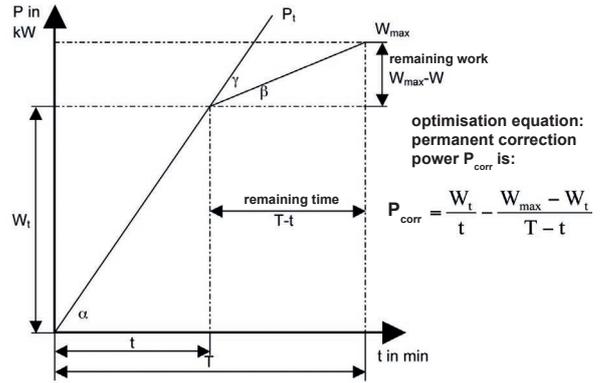
Diagram of PADICON[®] – Optimisation in a foundry



Partial view of the redundant optimisation unit



Ratio - temporary load value and 15 mins - average in kW
(15 Min - value = average of the performance in 15 mins)



Quotient from remaining work and time in the measuring period indicates the performance which is to be regulated and controlled.

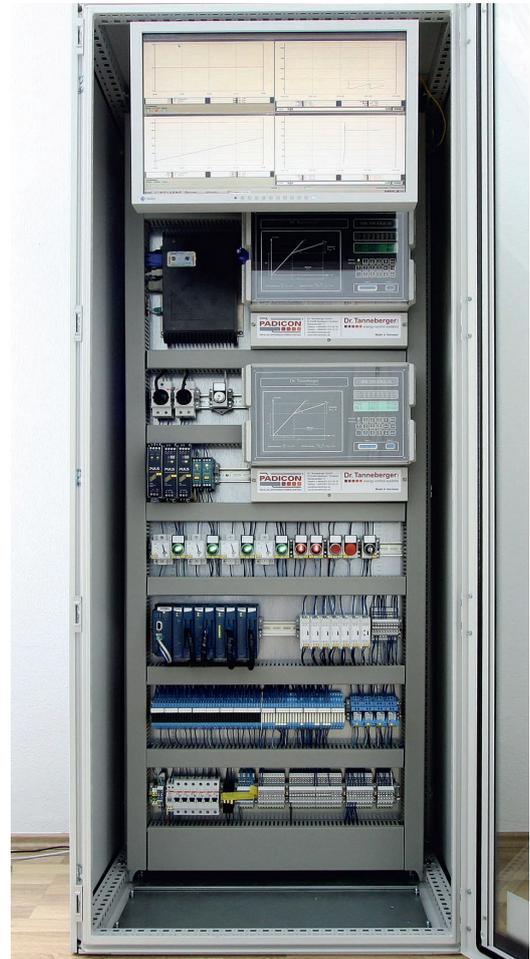
Energy costs are rising rapidly. Above all, energy intensive production processes, like in foundries and hardening plants, quickly come up against cost pressure because of their high energy demand. It is not just electrical energy which increases the costs in large companies. The price for electrical energy is calculated at only around 55% for electrical work. The second position which is also consequential is the price for power which makes up 45% of the energy price. Because the time in which the electrical energy is needed can be influenced much more easily than the required amount, these procedures are designed to optimise the capacity peak as quickly as possible and achieve the biggest savings in costs.

Control energy consumption – reduce costs

PADICON® the parallel difference power control is a world novelty which optimises operations in furnaces. This process is already in use in many renowned companies as an integrated part of their energy management system. Designed for all medium and main frequency furnaces, the process records the power and energy consumption and saves all the data which has been gathered. By repeating the work process, a characteristic curve occurs. Due to this characteristic, the process control computer can synchronise the individual intervals of all furnaces and ensure a balanced load profile without peak consumption. Energy intensive work processes therefore are not co-dependent but rather co-ordinated. Power peaks and reductions balance each other.

Groundbreaking new technology

Production planning and control systems that have been used up until now didn't have an energy consumption display. The energy consumption figure cannot be corrupted in order to make the process clear. The system harmonises itself by the PADICON® process. The melting process is not impaired as this no longer results in a load shedding. Therefore the furnaces are put under a lower thermal and electrical strain which increases durability and significantly reduces them wearing out.



PADICON® system control cabinet



Van Voorden foundry

saves 100 000 euros each year!

PADICON® reduces peak capacity by 39%!

A shift in melting times optimises the production process and reduces the peak capacity. With identical levels of production, PADICON® managed to save €100 000 each year.

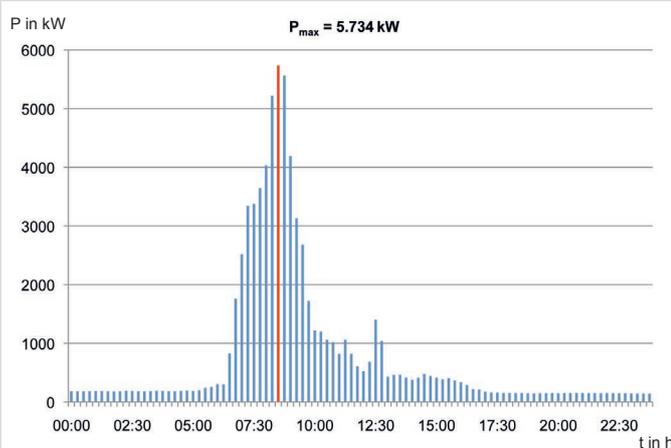
The foundry Van Voorden in the Netherlands produces ship propellers, nozzles and yacht propellers. Production plants with six coreless induction furnaces and automated systems form the basis of production. To produce heavy castings of up to 30 000 kg, a large amount is required to be melted at once. Until now, the peak capacities were a concern for the company. Exceeding the agreed maximum power costs Van Voorden approx. 85 000 Euros every year.

The solution is so simple.

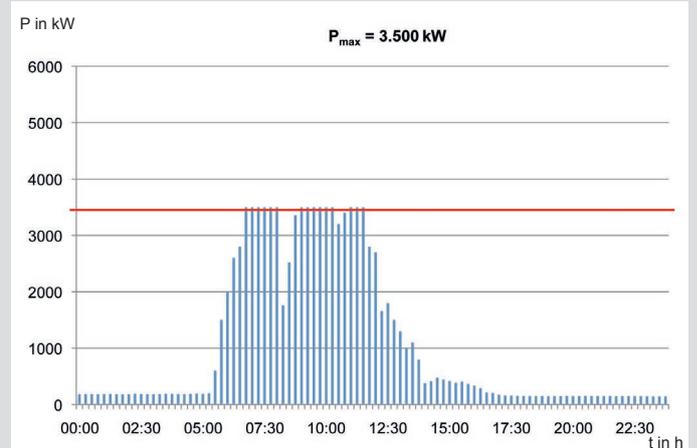
With Dr. Tanneberger, the tide has turned for this company. With the help of the parallel difference power control PADICON®, the furnaces at Van Voorden can now work effectively and efficiently. PADICON®, which is based on trend values, shifts the melting time and allows an even production process. The peak capacity and then the energy consumption will be reduced within the same level of production. Despite the reduction, the melting process is not impaired and exceeding the limit is practically impossible.

Balancing power fluctuations

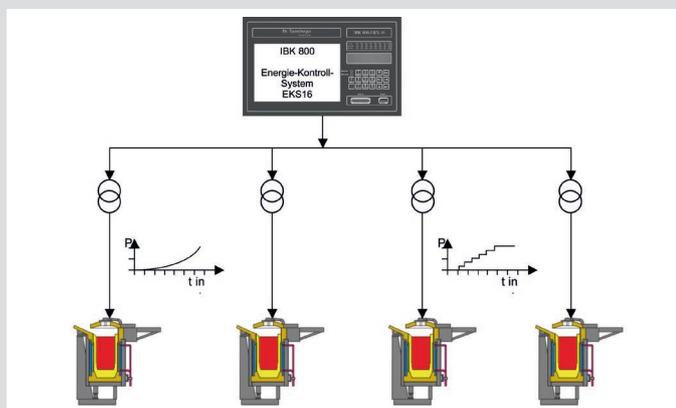
PADICON® improves the production process in the foundry. This means that energy intensive processes can run in a co-ordinated way instead of independent from each other. This way, the peak capacity and reductions balance each other. Fluctuations in energy demands are lowered.



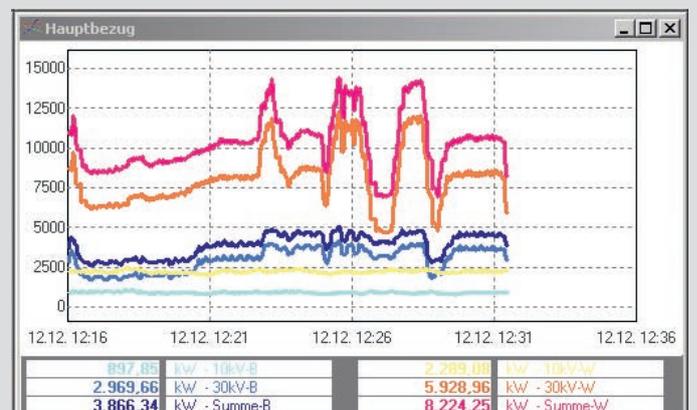
Performance (electrically) before PADICON® optimisation



Performance (electrically) after PADICON® optimisation



continuous or performance-based staged control of the induction unit in a foundry by PADICON®



Real-time representation of the production process (≥15)

The result:

Before using the parallel difference power control, the foundry operated with a peak capacity of 5.773 kW and now the system regulates to peak capacity to 3.500 kW.

Avoid accidents

Act instead of reacting: the „power ECG“ – Ampere Trend Control[®] permanent industry ECG (EKG)

Damages which lead to failure of a plant can have an affect on the whole system in different ways. In many cases, certain aspects about the power consumption of a motor can change e.g. increase in power consumption while operating at the same speed due to increased frictional and/or vibration losses.

Trend development of the wear condition

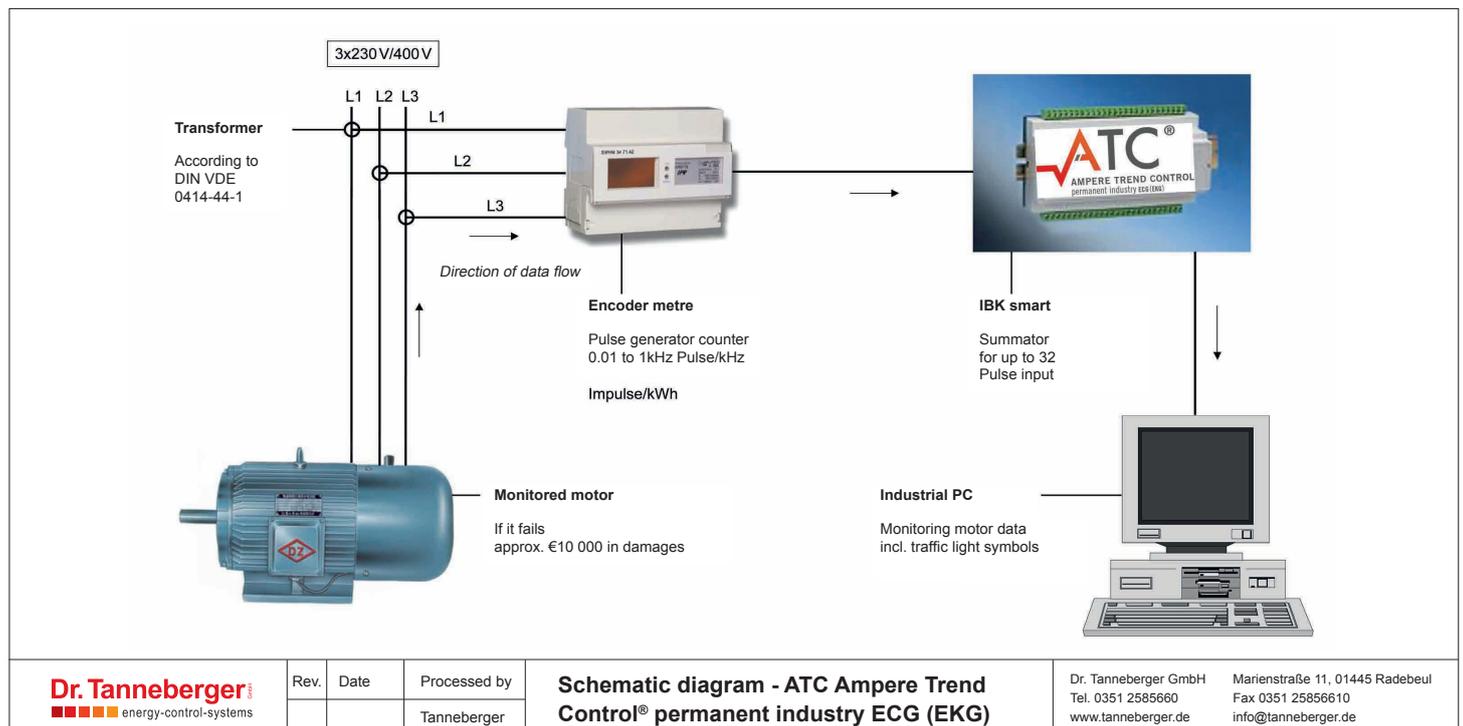
Wear frequently has an effect on the gradual increase in energy consumption or gradual change in the consumption patterns. In principle, the time remaining until the maximum load is exceeded, given by the motor circuit-breaker, can be predicted by the power consumption in combination with a statistical analysis.

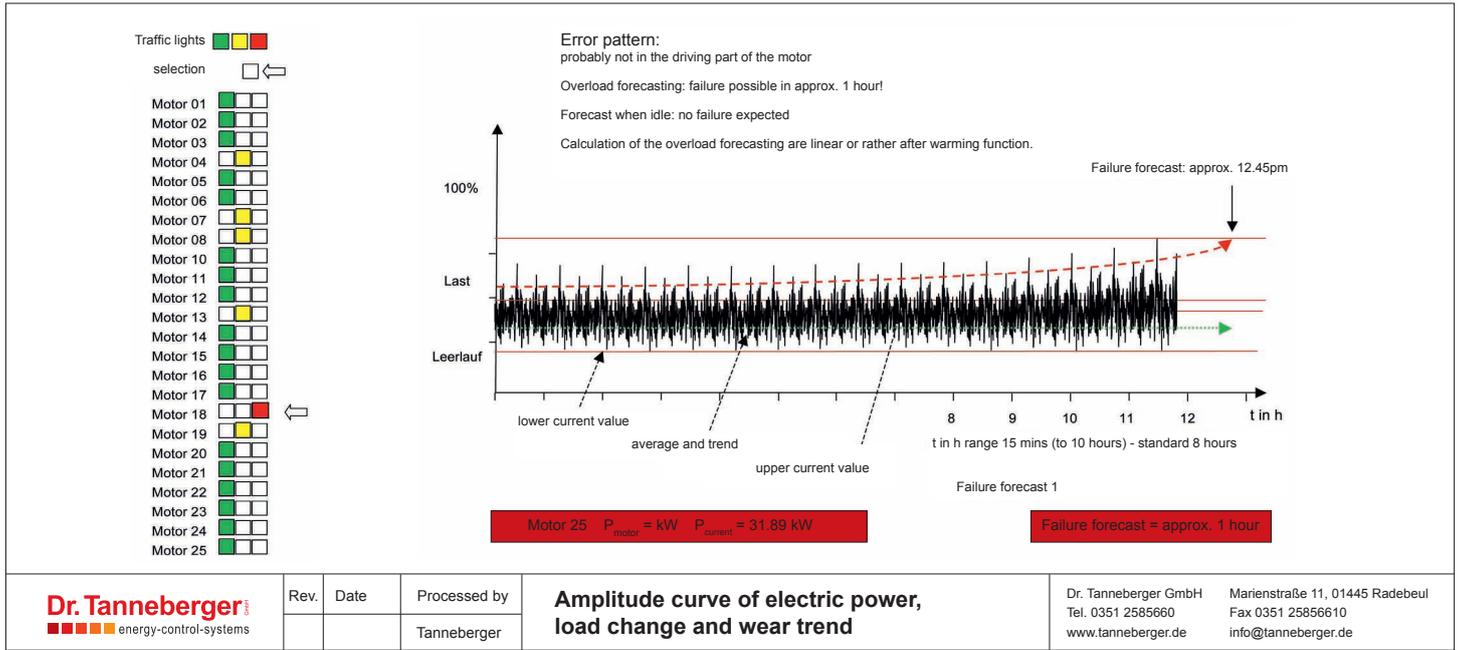
Warning of failure.

Depending on the time scale of the wear process, medium and long-term predictions can be made in the range of hours, days or months.

Motor circuit-breakers force the motor to switch off if the integral load limit is exceeded, in particular in order to avoid overheating and therefore the destruction of the motor itself. The ATC system allows for the corresponding load value to be included in the thermal trip range by integration on the basis of the whole power consumption in order to predict a possible trip of the motor circuit-breaker. Production could thereby be shut down before it suddenly switches off. Cost-intensive production failure and other further damages in plants are therefore avoided. Motors or damages equipment can be serviced and repaired in good time and before they fail by analysing the ATC data.

Find more information at: www.tanneberger.de





Confront rising energy costs by technical innovation.

Dear business partners and readers,

Rising energy costs, continuous cost pressure and the impact of the financial and economic crisis in recent years are the factors which are increasingly forcing companies to integrate solutions to reduce the company's expenditure in manufacturing technology.

Since 1992, Tanneberger GmbH, located in Radebeul, has successfully dedicated itself to exactly this aspect. The company is a skilful partner when it comes to energy control systems and energy optimisation processes. With the „tanneberger news“ you are always one of the first to be informed about the newest product development and industry trends. In the interview with the head of operation technology at a foundry of Siemens, you will discover how the parallel difference power control or PADICON® successfully and permanently reduces peak capacity in this specific case.

In particular, energy intensive industries have been benefiting from Dr. Tanneberger GmbH's innovative products for years. Since the energy management system is in use in the broad international spectrum, a Saxon and a Dutch company explain their motives for their investment in the PADICON® system in their progress reports, report on the results which they obtained and the repayment period. On the „Product portrait“, you will find information about how exactly and why PADICON® works so efficiently.

Best regards

Dr. Ralf Tanneberger



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