



A new energy policy for warehousing technology:
DSE, DAMBACH Smart Energy Management
for rail-guided stacker cranes

DAMBACH
LAGERSYSTEME

DSE, the DAMBACH Smart Energy Management system for rail-guided stacker cranes, considerably improves the economics of an automated warehousing system. Rail-guided stacker cranes are therefore much more efficient – and achieve that without a loss in performance.

- Peak currents from the mains reduced by a factor of five
- Smaller mains supply points and energy infrastructure
- Reduced energy consumption without complicated feeding into the mains

- No idle power compensation system
- Automatic compensation for mains fluctuations
- Can also be retrofitted to some existing controls

**Efficiency:
well-conceived energy management**

By using the existing mains supply, rail-guided stacker cranes can increase their performance. The additional energy needed for improved performance is gained from the power caps. The power caps are charged by recovering energy from the rail-guided stacker cranes as they lower their loads and/or brake.

A smaller mains supply is possible with new systems.

**Benefits:
proved in practice**

A system equipped with DSE reveals the possibilities:

System: 4 stacker cranes each 32 m high
Year of installation: 2015
Goods stored: 1000 kg pallets

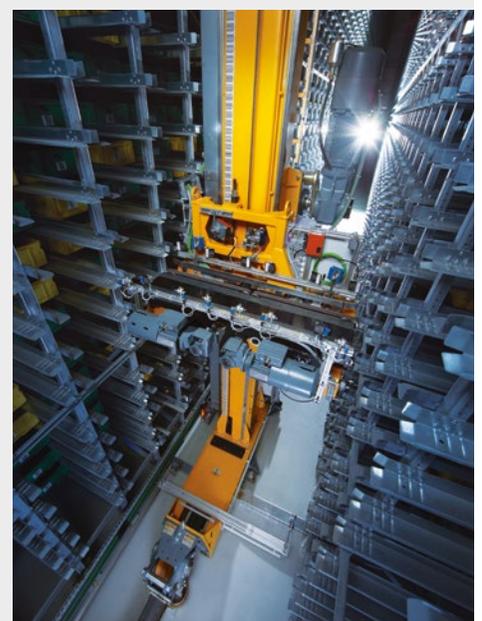
Performance figures with DSE:

- Travelling speed: 3.5 m/s
- Raising/lowering speed: 1 m/s
- Travelling acceleration: 0.5 m/s²
- Raising/lowering acceleration: 0.8 m/s²
- Current consumption: max. 24 A
- Connected load: 16 KW
- Power caps: 361 Wh

**Results:
much better economics**

The energy balance with DSE speaks for itself. The power peak required from the mains drops to just one-fifth. The energy consumption is reduced by a third.

The mains supply can be much smaller. The investment costs are lower.



High dynamics and less consumption:
DAMBACH energy management for
rail-guided stacker cranes



The energy recovered during braking and lowering is stored in power caps. Feeding energy back into the mains is unnecessary. This energy is then made available directly and efficiently. That improves the degree of efficiency.



**High-performance power caps:
the basis for efficient energy
management**

Power caps are high-performance energy storage elements and form the heart of DAMBACH DSE. They store the energy recovered from rail-guided stacker cranes while lowering loads or braking. This energy is then used to supplement energy from the mains for powering drive units. The power caps also provide energy reserves for power peaks, e.g. while raising loads and accelerating. No energy is fed back into the mains.

If the power caps cannot be fully charged by energy recovery, then DSE ensures recharging from the mains. Times of low activity in the facility are exploited and power peaks from the mains avoided. It is also unnecessary to configure the mains supply hardware to cover brief power peaks.

The basis for this extra efficiency is the intelligent synchronisation and connections between power caps, energy recovery and power supply network – all brought together in DAMBACH DSE.

**Power caps:
a long-standing, proven system
guarantees maximum reliability**

Years of experience with the use of power caps to store energy ensure trouble-free, efficient operations. Power caps are already used successfully in the DAMBACH shuttle system, where they replace cables or batteries and constitute the shuttle's energy supply.

In the shuttle, the very fast recharging time (within a minimum of 8 seconds) of the power caps enable 24/7 working without changing the batteries or long downtimes for recharging. Furthermore, power caps are very long-lasting, zero-maintenance units.

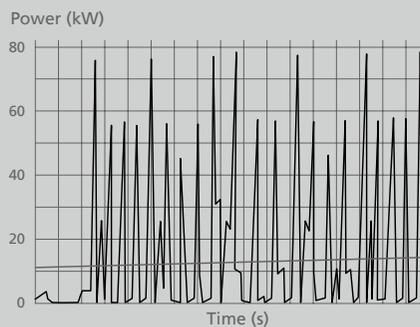
**Green logistics:
sustainability is not just a trend, instead an
important competitive factor**

Reducing energy consumption is the challenge facing technology and operation. For in the end, cutting energy consumption is not only an issue for operating costs, but also for the environment. But reducing the throughput of a facility is not the right answer here.

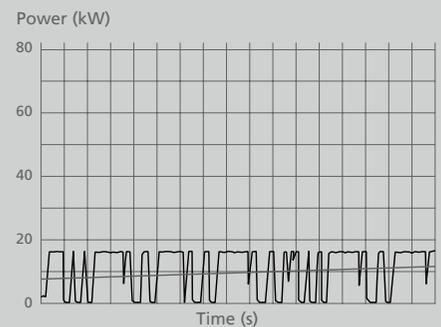
Implementing DSE in DAMBACH rail-guided stacker cranes shows that environmental thinking and economic efficiency are not mutually exclusive. On the contrary, they complement each other. Because DSE not only reduces energy consumption, it also maintains current throughput, indeed can even increase it.

Peak currents for energy supplies from the mains are compensated for. So the hardware needed for the mains connection for the facility can be smaller. The energy consumption is reduced.

Mains supply without DSE



Mains supply with DSE



Warehouse expansion: DSE optimises the energy supply

When expanding existing automated warehouse systems, the existing energy supply and subdistribution often constitute a bottleneck. It is then necessary to modify supply and distribution. That is also the case when the throughput of an existing system needs to be improved, when slow rail-guided stacker cranes are to be replaced by faster units or when more efficient drives are to be installed.

In these cases, DSE optimises the energy supply and reduces the costs and the work involved. Expanding the energy system or installing an additional energy system is then often unnecessary.

Intelligent energy management: DSE cushions power peaks efficiently

The energy stored temporarily in the DSE system is made available for brief power peaks, e.g. for raising loads and accelerating. DSE regulates the recharging of the power caps either from energy recovery or from the mains during times of low activity as well as the buffering of the energy.

The mains installations otherwise necessary for power peaks are therefore unnecessary. Installations already in place can be used for additional equipment or to improve performance.

If DSE is considered right from the start when planning a new system, the effect of the smaller mains supply is especially efficient.

Poor energy infrastructure: DSE is the reliable answer

Even if there is a poor energy infrastructure at the location or the mains is only designed for low power peaks and is prone to failure, efficient warehouses need good power supplies with good availability. Brief mains failures should not lead to malfunctions and voltage peaks must be smoothed out. And if the main supply fails completely, then all equipment must come to a controlled stop.

Through smart recharging of the power caps, partly from the mains, partly from energy recovery, the peak current taken from the mains is reduced by a factor of five – and without this having a negative effect on warehouse throughput.

The recovered energy is not fed back into the mains, instead is reused locally. There is no need for complicated mains synchronisation and the associated hardware. That improves the degree of efficiency, which in turn improves the energy balance. Energy consumption is cut by a third.

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