

KONE regenerative solution

ECO-EFFICIENT SOLUTIONS FOR ENERGY-SAVING, MID-RANGE ELEVATOR TRAFFIC

Advanced elevator technology for today's complex building requirements

Advanced elevator technology provides big opportunities to save energy. In order to keep costs as low as possible, building managers need to keep an eye on energy consumption. The installed elevator equipment not only needs to be energy efficient, it must also be capable of handling power surges. It must also not be affected by, or have an effect on, other electrical equipment.

KONE regenerative drives: designed for an energy-hungry world

KONE regenerative drives are high-speed, high-capacity drives offering maximum performance for mid-rise buildings. The range covers all types of applications – new or renovated – such as residential, office, or public buildings.

KONE regenerative drives are designed to work with KONE EcoDisc® machines. They provide speeds up to 3 m/s with loads up to 1600 kg and the capacity to handle up to 240 starts/h. Energy regeneration is a standard feature, and Electromagnetic Interference and Harmonic Distortion are kept well below code requirements. At the same time, KONE drives offer extremely accurate stopping to improve safety. The accuracy can also be programmed to fit the acceleration/jerk values and the ride comfort can be adjusted to meet levels specified by the building/customer.

Developed by a world leader in energy efficiency

KONE was the first elevator company to focus on the importance of energy efficiency with the introduction of its permanent magnet synchronous motor series. These motors consume up to 70% less energy than conventional elevator solutions, with 30-40% lower peak starting current requirements. KONE was also the first company to offer regenerative systems, which recover up to 30% of the elevator system's total energy consumption. KONE set the standard in energy efficiency for high-speed elevator traffic, resulting in lower operating costs.

Economical operation thanks to energy regeneration

The KONE drive uses Modulated Line Bridge technology to continuously supply energy back to the power network during the braking phase. With the KONE EcoDisc motor acting as a generator, the car, counterweight and braking system generate energy that is converted into electrical current that can be used elsewhere in the building or to drive other elevators (see the motor input power curves to clarify the different phases of the drive). The regenerated power is 'clean' with low harmonic distortions. Up to 30% of the total electricity used by an elevator can be recovered, resulting in lower net electricity consumption in the building. Over the lifetime of the equipment, the cost savings can be considerable.

In order for this electricity to be used in the building, the energy regeneration system has to be linked back to the building's electrical network.



KEY BENEFITS

Economy in operation & installation

- Up to 30% energy savings with regeneration and permanent magnet motor
- Low Amps (A) for starting power
- Low kWh in operational use

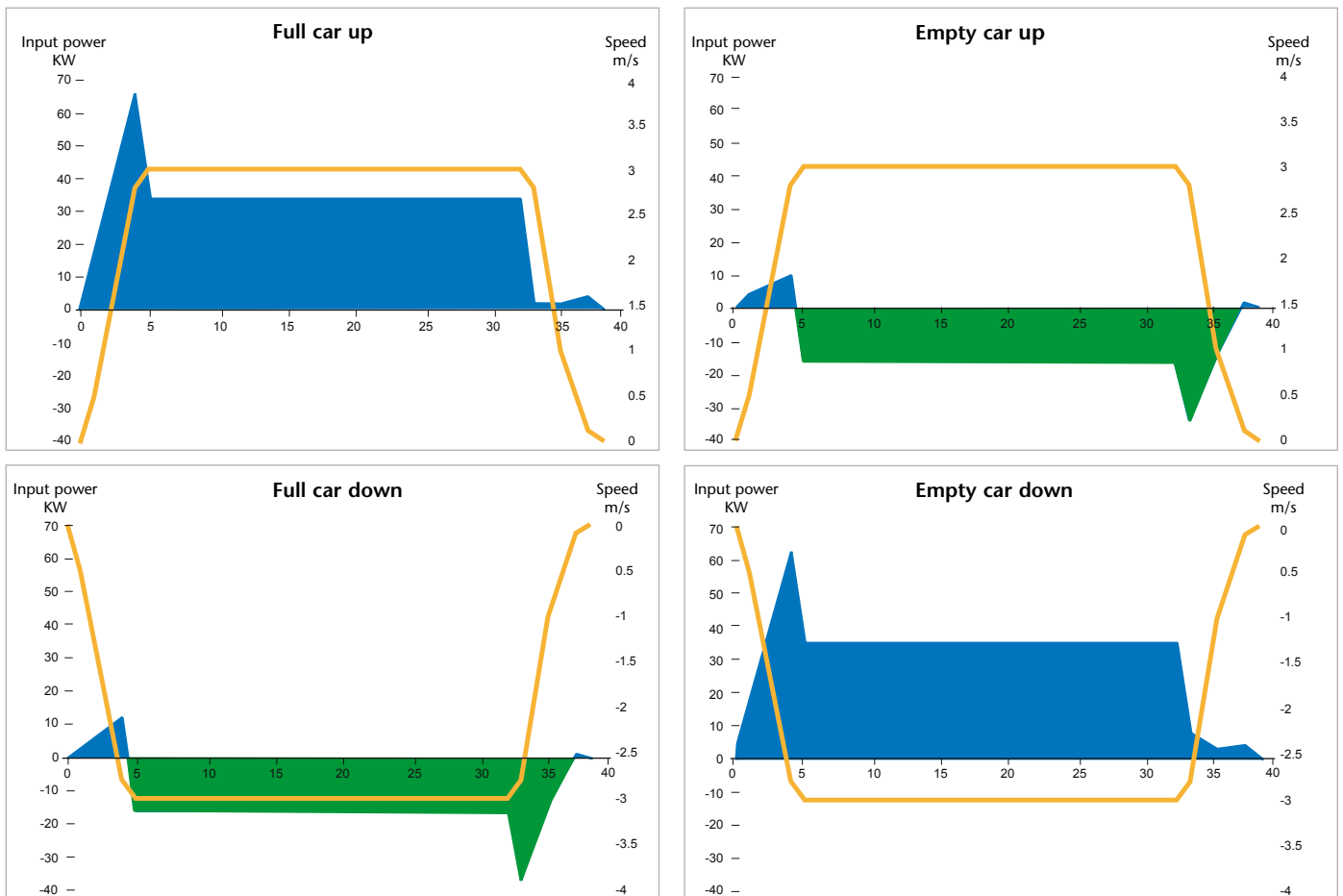
Seamless integration with power supply

- Low harmonic distortion
- Low electromagnetic interference
- High undervoltage tolerance
- Good power factor: 0.95 or better

Top quality ride comfort

- Optimum speed curves
- Reduced in-car vibration

Savings up to 30% with KONE regenerative solution



Car size: 1600 kg | Speed: 3m/s, 0.8m/s | Travel: 100 m | Machinery: MX18 + MLB

When a full car is going down or an empty car is going up, the system is regenerating energy into the building's power network. So, for most of the elevator's travel time, the system generates energy.

Economical in operation

The use of a sophisticated converter allows for a line current power factor of 0.95 or better. This enables a reduction in peak power demand by 30-40% during acceleration. Fuses, cables and generators can therefore be smaller, resulting in lower installation and operational costs.

Lifetime savings

A KONE drive with a KONE EcoDisc motor provides less costly installation and reduced power consumption in operation. When the value of energy regeneration is added to this, prospective owners can look forward to significant savings over many years of reliable operation.

Low harmonic distortion and electromagnetic interference

The KONE drive makes use of a sophisticated modular line bridge featuring true four quadrant operation to minimize disruption of this wave. Total Harmonic Distortion is kept to less than 8%, well within the limits of the building code, and electromagnetic interference is kept to a minimum.

Undervoltage tolerance

The KONE drive allows up to -15% undervoltage. So it can deal seamlessly with voltage drops when the network is overused.

Non-standard circumstances

In CTU (Construction Time Use) or emergency operation, power requirements are reduced to less than 50% of full power by decreasing the nominal speed.

Top quality ride comfort

Optimum Speed Curves

The KONE drive system features adjustable acceleration and deceleration profiles. This allows the speed and acceleration curves to be 'programmed' to meet local expectations while optimizing the system's energy performance.

Reduced in-car vibration

Elevator motor torque and speed are controlled through the machine's electromagnetic state. This feature practically eliminates the torque ripple of the motor. This results in a low vibration level in the car, providing a more comfortable ride.