

Shock Absorbers Reduce Vibration in Compact Sorting System

Christmas is around the corner. Due to the popularity of online shopping, the volume of packages is increasing. To take Germany as an example, the country saw 330 million gift deliveries in 2018, according to the Federal Association of Parcel and Express Logistics. Sorting plants have to cope with these rising quantities—especially at peak times of the year. This demand places more pressure on sorting machines, which must be able to move at high speeds without losing packages.

In this case study, we explore how a new, high-end sorting system was experiencing vibration, which increased the risk that packages would fall off the conveyor. ACE miniature shock absorbers put a stop to this problem—ensuring fast, accurate deliveries.



The calm before the storm. Christmas isn't the only time when sorting facilities process thousands of packages. (Credit: Equinox MHE)

A Leader in Sorting Machines

Not far from the North Sea is the Dutch municipality, Hillegom. At first glance, it's hard to imagine that one of Europe's largest manufacturers of sorting systems is based in this picturesque environment.

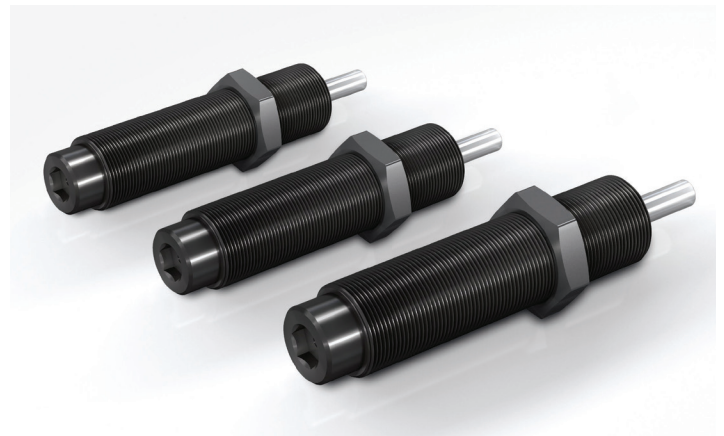
The company, Equinox MHE, provides turnkey logistic automation systems, including manual sorting, picking and warehouse management systems. Users can select their own sorting parameters, including postal code, shipping route and order—the last of which is an important factor for e-commerce companies, especially during the holidays.

Equinox MHE sorting machines integrate trays to transport products. When a product enters the machine, the system identifies it by scanning the barcode. A tray then transports the product to another station, where it is sorted, packed and eventually shipped.

Troublesome Vibration Due to Tight Curves

Equinox MHE manufactures many kinds of sorting machines, including split tray sorters, which have a characteristic oval-shaped conveyor on which the trays circulate. To save on space, company engineers had designed a split tray sorter with a smaller curve radius. As a result of this design, the transported containers moved close together along the curves—causing vibration. In a worst-case scenario, this vibration could cause valuable cargo to fall off the conveyor.

To avoid this outcome, Equinox MHE contacted ACE, which was already a well-known supplier of damping technology in the company's in-house design department. "It's always a positive experience to work with ACE on a project," says Tjalling Dolman, project manager at Equinox MHE. "They are dedicated partners who do whatever they can to get the best results."



The self-adjusting, maintenance-free MC150EUM series of miniature shock absorbers. (Credit: ACE Stoßdämpfer GmbH)

Because the speed on the conveyor belt inside the sorting system was much slower on the inside than on the outside, Han Titulaer, ACE technical consultant, initially wanted to use several different types of miniature shock absorbers for the inside and outside of the oval. The Equinox MHE team, however, preferred to use a single product type to facilitate maintenance.

ACE Mini Shock Absorbers Stop Centrifugal Forces

To meet these requirements, ACE engineers determined the best solution was their MC150EUM miniature shock absorbers. These maintenance-free, ready-to-install devices feature a hermetically sealed rolling diaphragm, which completely separates the damping fluid from the surrounding air and also delivers low return forces. Users can install these absorbers directly in a pressure chamber for end-stop damping in pneumatic cylinders up to 100 psi.

Other notable features include integrated positive stop, a wide range of effective weight and a side load adapter that allows impact angles up to 25 degrees. Despite their small size, the shock absorbers have an energy capacity of 20 Nm per cycle—or 34,000 Nm per hour with a stroke of just 150 mm.



Equinox MHE manufactures sorting machines and other turnkey logistic automation systems. (Credit: Equinox MHE)

In addition to their superior damping performance, the MC150EUM series features a service life up to 25 million cycles—four times that of traditional shock absorbers. Units are also available in stainless steel and include a variety of accessories for quick, simple installation. In addition to packaging equipment, the miniature shock absorbers are suitable for a variety of automated applications, including material handling equipment, robotics and machine tools.

When installed in the split tray sorter, the shock absorbers instantly smoothed out the movements of the trays traveling along the curves—successfully reducing the troublesome vibration and eliminating the risk that packages would topple out. “The ACE miniature shock absorbers fit perfectly with our requirements,” Dolman says. “As expected, the components work smoothly.”

To learn more, please visit: www.acecontrols.com