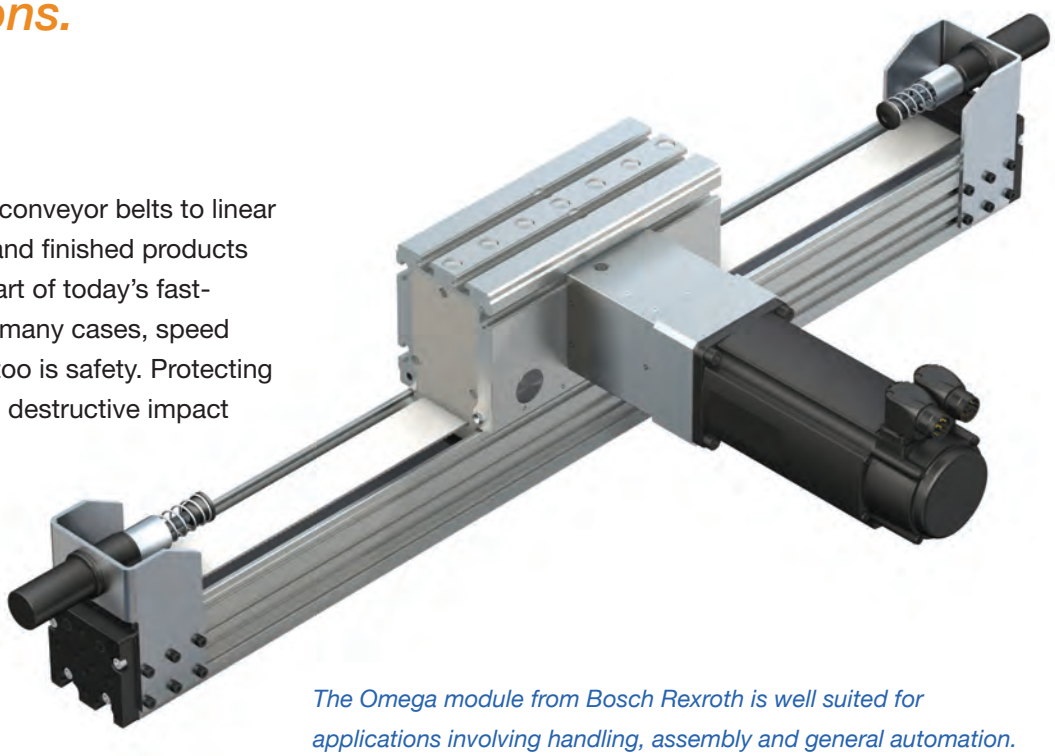
Safety Dampers Protect Linear Modules From Runaway Motion

Specialized shock absorbers guard against damage in dynamic applications.

From pick-and-place equipment to conveyor belts to linear transfer lines, moving work pieces and finished products from point A to point B is a major part of today's fast-paced production environments. In many cases, speed and precision are top priorities. So too is safety. Protecting both operators and equipment from destructive impact forces is a critical task—one that is often accomplished with shock absorbers and safety dampers. In the case of linear modules that must endure high speeds and loads, well-designed safety dampers provide reliable insurance against impact damage at an affordable cost.



The Omega module from Bosch Rexroth is well suited for applications involving handling, assembly and general automation. Safety dampers from ACE are used in the end positions.

Designed to protect people and equipment in runaway motion situations, safety shock absorbers from ACE offer a cost effective method of safeguarding vital machinery in emergency stop situations. An optimized orifice design provides extremely high capacity in a compact size, making these safety dampers ideal for critical applications on automatic transfer machines, robot systems and other applications where uncontrolled motion could result in expensive damage or danger. With up to 300% higher capacity than traditional shock absorber designs, ACE's SCS33 to SCS64 safety dampers enable true linear deceleration to protect vital machinery at an economical cost.

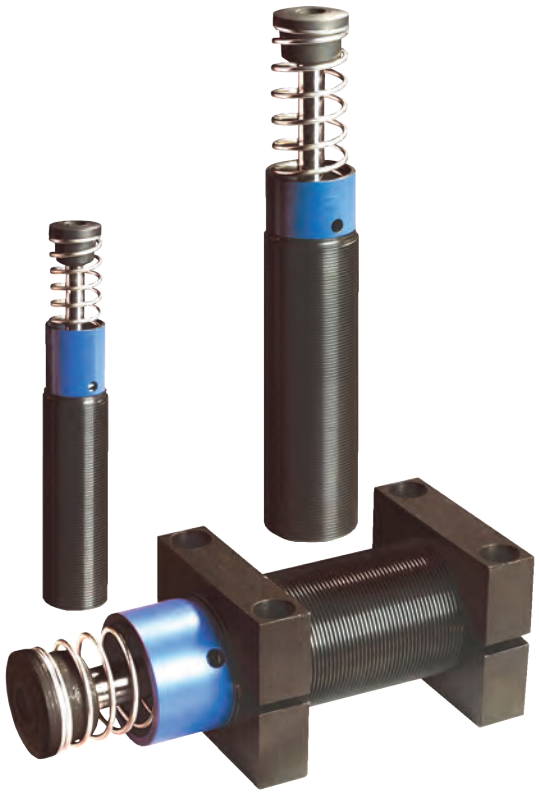
These safety dampers were recently chosen to provide extra insurance for a widely used linear module assembly.

The Bosch Rexroth Omega modules feature drive components on the carriage, enabling a variety of configurations that are especially beneficial for long strokes in either a vertical or horizontal position. In this particular module, three sizes with main body widths of 55-, 85- and 120-mm and lengths to 5500 mm are available. Excellent repeatability and high rigidity make this module well suited to long strokes with speeds to 5 m/s and accelerations to 50 m/s2.

However, some end users of this linear module system require extra insurance against runaway motion should an unforeseen emergency occur.

Due to the loads and speeds involved in many of these linear motion applications, the module's design engineers wanted to offer customers an optional industrial impact damper to protect the Z-axis against uncontrolled motion. Working together with engineers from ACE, safety dampers were carefully designed over a nine-month period to work perfectly with the linear modules. Compared to standard hydraulic industrial impact dampers, ACE safety dampers are specifically designed for emergency use only and offer reliable protection at an affordable cost. In this scenario, three load ranges from 20 to 90 kg, at impact speeds to 5 m/s, had to be accounted for.

Several hydraulic safety dampers were considered, based on ACE's online calculator that makes it easy to enter the relevant applications parameters. A slightly elevated impact speed was assumed in all cases to give the linear modules some flexibility. While ACE's SCS33-50 impact damper with maximum energy absorptions of 620 Nm per stroke would have worked for the lower load ranges, the calculation showed that the larger SCS45-75 would



SCS-series from ACE: Safety impact dampers from ACE are an affordable alternative to industrial impact dampers for reliable protection of linear modules and systems.

be required to handle the higher moving mass (maximum 90 kg) for the 1654.6 Nm per stroke. The result is that the linear modules are now more than capable of providing reliable service in an emergency.

Since 2011, these compact safety dampers have been successfully installed in high-end linear modules with zero problems reported to date.

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