



## Innovations Damping technology

Industrial shock absorbers  
PowerStop

- + Mini Energy series
- + Standard Energy series
- + High Energy series
- + Adjustable Energy series

**THE KNOW HOW FACTORY**

# INDUSTRIAL SHOCK ABSORBERS POWERSTOP

## SUPERIOR TECHNOLOGY IN PERFECTION

**ZIMMER TRIUMPHS WITH THE SIGNIFICANT UPGRADE OF THE POWERSTOP INDUSTRIAL SHOCK ABSORBERS, WHICH ARE FAMOUS FOR THEIR QUALITY AND DURABILITY. MAXIMUM DAMPING PERFORMANCE IS WHAT THE VIBRATION-FREE SPIRAL GROOVE TECHNOLOGY HAS REPRESENTED SINCE THE BEGINNING. A MODULAR SYSTEM WITH IDEAL PROTECTION FOR ANY ENVIRONMENT AND AN INNOVATIVE ORGANIC OIL ARE JUST TWO OF THE NEW FEATURES THAT AWAIT YOU.**

With the introduction of the High Energy series, the PowerStop industrial shock absorbers' commitment to quality has represented the highest standard in performance for over 20 years. Their proven features have been enhanced even further with the underlying optimization. The shock absorbers use an innovative, organic oil that can be used in the food industry with H1 certification and is even biodegradable. The

highest in corrosion protection is achieved thanks to the use of stainless steel for the housing and piston rod.

In addition, a new fixed stop with a longer piston rod guide length has been developed to increase the PowerStop's well-known robustness even more. The product line is completed by an extensive range of accessories.

### 1 Oil reserve

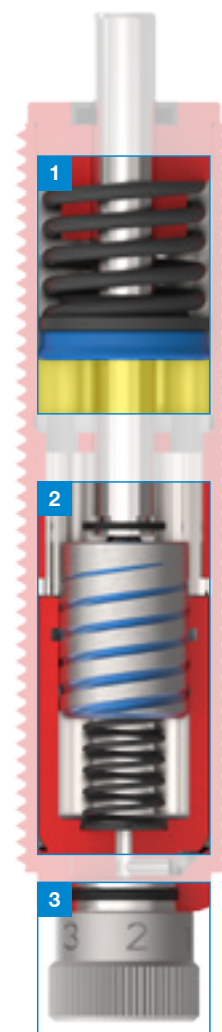
Alongside volume compensation during retraction, an additional volume reservoir can be implemented by the combination of a dynamic seal and a spring with the organic oil. This results in the longest running times. These are regularly verified in internal worst-case scenario endurance tests in overhead applications.

### 2 Spiral groove technology

The unique spiral groove technology is a defining feature of PowerStop industrial shock absorbers. In contrast with conventional industrial shock absorbers with throttle bores, the continuously tapering spiral groove provides precise and low-vibration damping absorption. Optimized loads at every piston position enable maximum energy absorption with the smallest footprint. In addition, a longer service life and performance capacity of the organic oil is achieved.

### 3 New Adjustable Energy series

With the Adjustable Energy series, the adjustment of the energy absorption has once again been optimized, producing the softest possible damping. This is attained by means of a spiral on the bottom of the damper, through which the flow can be adjusted steplessly via a bypass.



# PRODUCT FINDER

## A HIGH-PERFORMANCE TOOL

### Clearly arranged selection guide

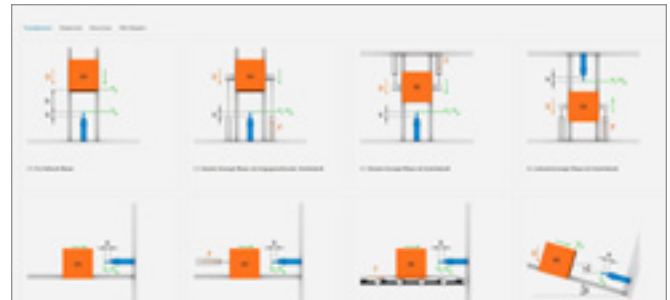
The available dampers that meet these specifications are shown to the user in an overview table. The energy absorption for each damper is individually calculated in the table and its load is displayed.

### Advanced search using a filter

Using filters, additional marginal conditions can be entered. These include especially high or low temperatures, use in the pressure chamber, contaminated environments or large angles for the impact of the load. The software returns suitable versions and necessary accessories or equipment options based on the selected filter.

### Convenient calculation delivers fast results

A choice between a large number of different load cases appropriate to the case can be selected very easily. The procedure is very simple: All one has to do is select the right load case and then specify the required values to obtain a reliable result.



*Users receive a high-performance tool that allows them to make wellfounded selection decisions quickly and combines calculation, selection guide and configurator functions in one tool.*

### Smart solution, available on mobile devices

Since the calculation program is available online, customers do not have to install any software and can access it using any computer or laptop, as well as with any smartphone or tablet.

**FINDING  
YOUR PRODUCT  
FASTER**

#### ▶ PRODUCT FINDER

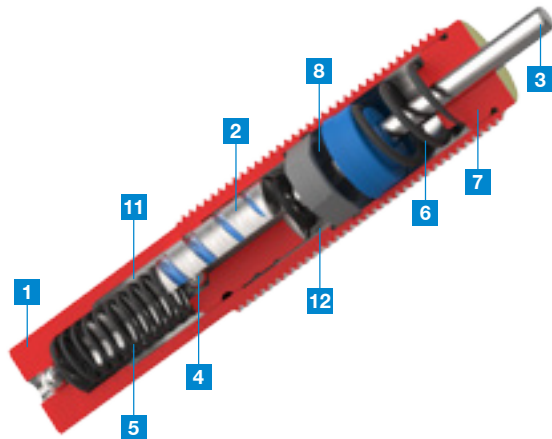
- ▶ Calculate and select shock absorbers more quickly
- ▶ Convenient calculation delivers fast results
- ▶ Clearly arranged selection guide
- ▶ Advanced search using a filter
- ▶ Smart solution, available on mobile devices



# INDUSTRIAL SHOCK ABSORBERS POWERSTOP SERIES AT A GLANCE

## Mini Energy – the slender

The Mini Energy provides a high rate of energy absorption when it comes to precision damping in miniature areas. Also installed in the cylinder for even greater space savings.



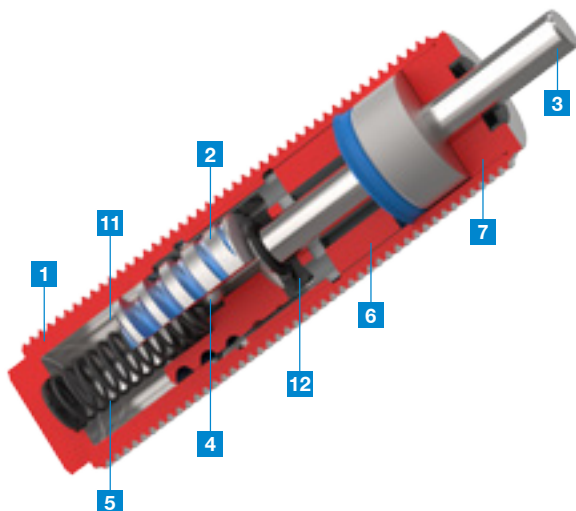
### PRODUCT ADVANTAGES

- ▶ Highest performance in a minimal space
- ▶ Integrated oil volume reservoir
- ▶ Increased guide length

	▶ Technical data
Series	<b>Mini Energy</b>
Thread	M4 - M6
Max. pressure (abs.)	10 bar
Stroke versions	Normal
Protection	Without protection, wiper

## Standard Energy – the economical

The market leader among standard dampers. Efficient damping at common energy absorption levels. This makes the Standard Energy series the winner in price/performance value.



### PRODUCT ADVANTAGES

- ▶ Price/performance winner
- ▶ Low-vibration damping thanks to spiral groove
- ▶ Low supporting force

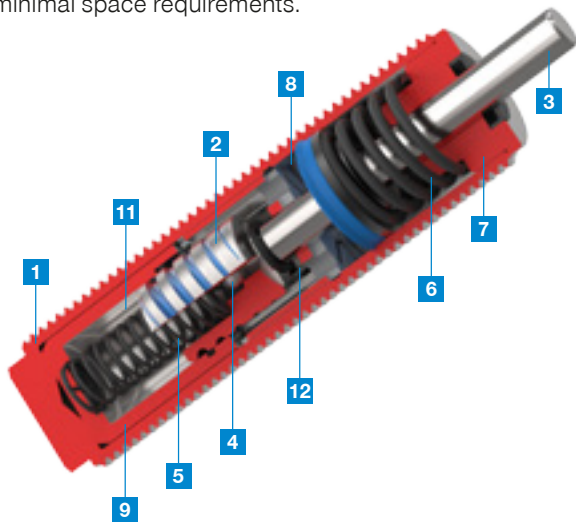
	▶ Technical data
Series	<b>Standard Energy</b>
Thread	M8 - M36
Max. pressure (abs.)	1 bar
Stroke versions	Normal
Protection	Without protection, wiper, felt ring, bellows

- 1** Housing (stainless steel)
- 2** Damping piston with spiral groove
- 3** Piston rod (stainless steel)

- 4** Return valve
- 5** Return spring
- 6** Volume compensation

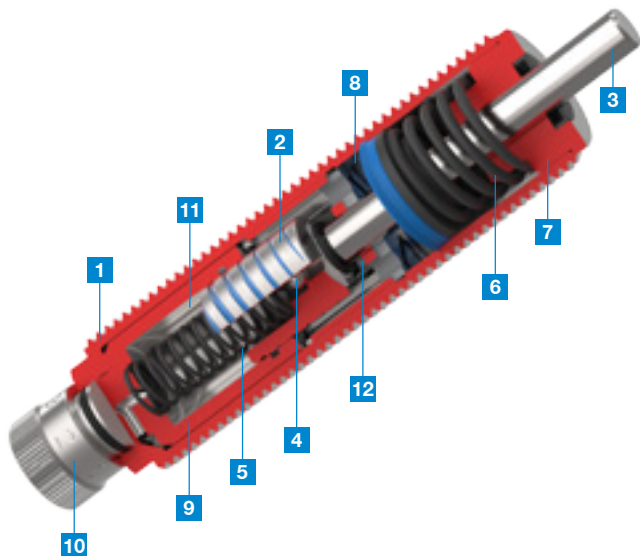
## High Energy – the high performer

The high-end damper for the most stringent requirements. Thanks to the spiral groove in combination with the pressure sleeve and the oil volume reservoir, the High Energy series achieves a number of cycles that exceeds everything else on the market, with extreme energy absorption levels. All this with minimal space requirements.



## Adjustable Energy – the adjustable

Can the High End series be surpassed? Yes, with the new adjustable series, the high energy absorption levels can be precisely adjusted to the entire stroke. Thus, the force is reduced and the damping is even gentler.



- 7** Fixed stop
- 8** Oil reserve storage
- 9** Pressure sleeve

### ▶ PRODUCT ADVANTAGES

- ▶ For the most stringent requirements and maximum energy absorption
- ▶ Integrated oil volume reservoir
- ▶ Hardened and precision-ground guide
- ▶ Cycle counts that outperform everything else on the market

	▶ Technical data
Series	<b>High Energy</b>
Thread	M8 - M36
Max. pressure (abs.)	10 bar
Stroke versions	Normal / long
Protection	Without protection, wiper, felt ring, bellow

### ▶ PRODUCT ADVANTAGES

- ▶ Optimally adjustable damping across the entire stroke
- ▶ Reduced supporting force — decreased load on the design
- ▶ For the most stringent requirements and maximum energy absorption
- ▶ Hardened and precision-ground guide

	▶ Technical data
Series	<b>Adjustable Energy</b>
Thread	M8 - M36
Max. pressure (abs.)	10 bar
Stroke versions	Normal / long
Protection	Without protection, wiper, felt ring, bellow

- 10** Adjustment screw
- 11** High-pressure chamber
- 12** Low-pressure chamber

# INDUSTRIAL SHOCK ABSORBERS POWERSTOP

## MAXIMUM FLEXIBILITY

### A modular system that leaves nothing to be desired

The new assembly set makes it possible to combine highly versatile application-specific variants from four series, each with a stroke variant, speed range, protection and head. Everything comes from standard elements, delivering the

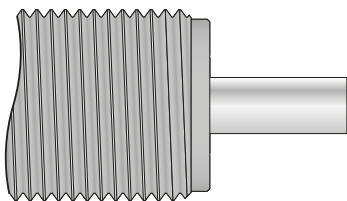
shortest time to availability and ideal pricing. The new Mini Energy, Standard Energy, High Energy and Adjustable Energy series offer a number of refinements, significant improvements and enhancements.

### Stroke variants

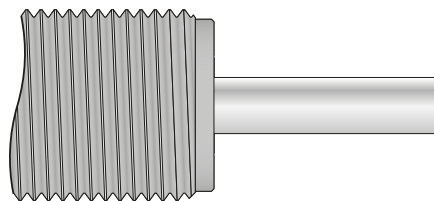
Thanks to the stepless taper, the invention of the spiral groove enabled the highest energy absorption levels in the smallest installation space and thus the smallest **N** strokes. However, not every machine is equipped for these kinds of loads, and not every design can handle such decelerations.

With the long stroke versions **L** the same respective energy absorption levels can be decelerated over a longer damping stroke, whereby the supporting force is reduced significantly for the softest possible damping.

#### **N** Normal stroke



#### **L** Long stroke



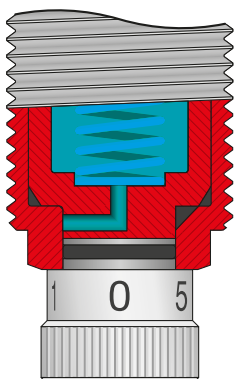
### Degree of hardness – optimal damping adapted to speed

The flow of the organic oil from the high-pressure chamber to the low-pressure chamber is determined by the depth and width of the spiral groove, and the desired throttling is achieved. Therefore, the flow starts at very high speeds in order to reduce the impact power. At low speeds, the flow is

low in order to achieve high energy absorption. For the Adjustable Energy series, the flow can be steplessly adjusted by means of an additional bypass. Thus, the damping can be optimally adapted to the speed.

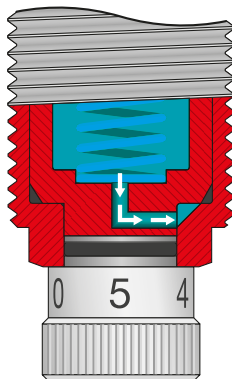
#### **1** Closed position

0% flow/  
Hard

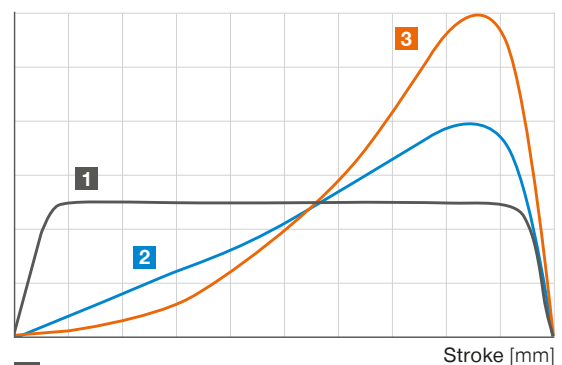


#### **3** Open position

100% flow/  
Supersoft



Force [N]



- 1** Hard
- 2** Medium
- 3** Soft/Supersoft

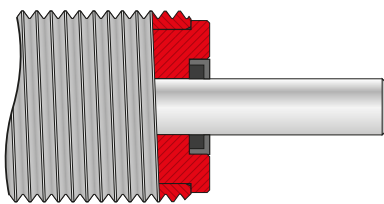


## Ideal protection in any environment

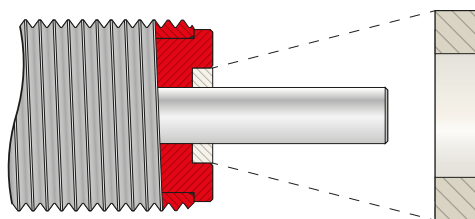
Thanks to the broad-ranging modular system, the PowerStop offers the right protection for any condition. In a clean environment, such as that of an assembly process, the damper does its job cost-effectively without any special protection **D**. With the optional wiper **A** made of NBR, it is resistant to any kind of liquid or oil. The best way to keep dust and chips

outside the damper, even when working with wood, is with a felt ring **F**. Last but not least, the bellows **B** made of TPC provides the ultimate protection against adverse conditions such as grinding dust or use within a liquid. At the same time, it does not allow any particles to escape from the damper and can thus be used in cleanrooms and the food industry.

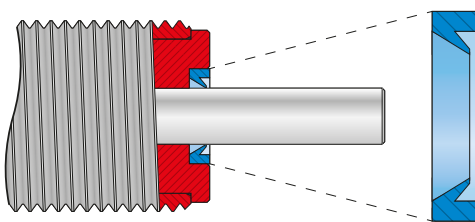
**D Without protection**  
*in a clean environment*



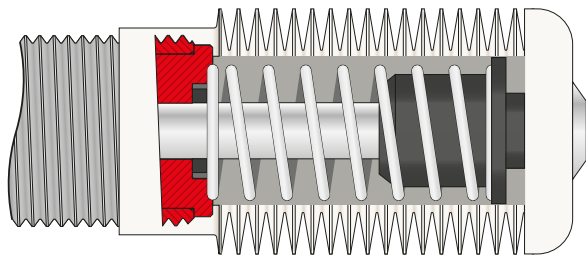
**F Felt ring**  
*against dust and chips*



**A Wiper (NBR)**  
*against liquid and oil*



**B Bellows (TPC)**  
*sealed*

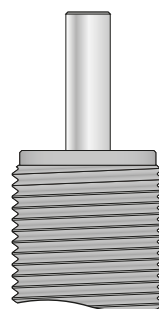


## Heads

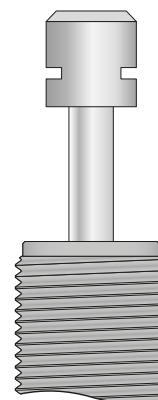
For even greater durability at oblique angles of impact, all heads including the piston rod **D** are rounded in order to absorb loads with reduced transverse force. A longer fastener for the heads ensures a firm support. In addition, these are crimped via lateral recesses for tight fitting.

Whether with head or without, the new PowerStop features an integrated fixed stop that can absorb any residual energy or static force in the end position. Thanks to the enlarged steel head area **S**, the surface pressure upon impact is reduced, which is ideal for soft opposing materials. Using a plastic head is recommended for additionally reducing the amount of noise that is generated **K**.

**D**



**S**



**K**

