

Miniature Shock Absorbers

Tuning for almost any design

Miniature shock absorbers from ACE are tried-and-tested quality products used in millions of industrial designs throughout the world. They optimize machines in an equally reliable and effective way by decelerating loads quickly and without recoil.

The compact, maintenance-free, hydraulic machine elements can be easily and quickly integrated in any design and certain models can be directly integrated in pneumatic cylinders. They reduce the load and increase the efficiency for handling devices, rotary and pivoting actuators, linear cylinders and many other industrial applications. ACE ensures a long service life with innovative sealing techniques, shock absorber and inner pressure chambers fully machined from solid high tensile alloy steel.

Easy, inexpensive construction

Large variety of models for every purpose

Less stress on the machine

Reduced operating costs

Maintenance-free



Miniature Shock Absorbers



MC5 to MC75 Page 18

Self-Compensating

Shock absorbers in miniature format

Miniature slides, Pneumatic cylinders, Handling modules, Copiers

MC150 to MC600 Page 20

Self-Compensating, Rolling Diaphragm Technology

Exceptionally high endurance and with the lowest resetting force

Linear slides, Pneumatic cylinders, Swivel units, Handling modules

MC150-V4A to MC600-V4A Page 22

Self-Compensating, Stainless Steel, Rolling Diaphragm Technology

Exceptionally high endurance with stainless steel corrosion protection

Clean room areas, Pharmaceutical industry, Medical technology, Food industry

PMCN150 to PMCN600 Page 24

Self-Compensating, Rolling Diaphragm Technology, TPU Bellow

Reliable protection from fluids and particulate

Finishing and processing centers, Clean room areas, Pharmaceutical industry

PMCN150-V4A to PMCN600-V4A Page 26

Self-Compensating, Rolling Diaphragm Technology, TPU Bellow

Optimum corrosion protection

Finishing and processing centers, Clean room areas, Pharmaceutical industry

SC190 to SC925 Page 28

Self-Compensating, Soft-Contact

Long stroke and soft impact

Linear slides, Pneumatic cylinders, Handling modules, Machines and plants

SC²25 to SC²190 Page 30

Self-Compensating, Piston Tube Technology

Piston tube design for maximum energy absorption

Linear slides, Pneumatic cylinders, Swivel units, Handling modules

SC²300 to SC²650 Page 32

Self-Compensating, Piston Tube Technology

Piston tube design for maximum energy absorption

Turntables, Swivel units, Robot arms, Linear slides, Pneumatic

SC25-HC to SC650-HC Page 34

Self-Compensating

Miniature self compensating shocks for high-speed applications

Linear slides, Tool machines, Handling modules, Production plants

MA30 to MA900 Page 36

Adjustable

Stepless adjustment

Linear slides, Pneumatic cylinders, Swivel units, Handling modules

3/8x1 Page 38

Adjustable

Miniature adjustable shock delivers convenience

Linear slides, Transport industry, Tool machines, Handling modules

MC5 to MC75

Shock absorbers in miniature format

Self-Compensating

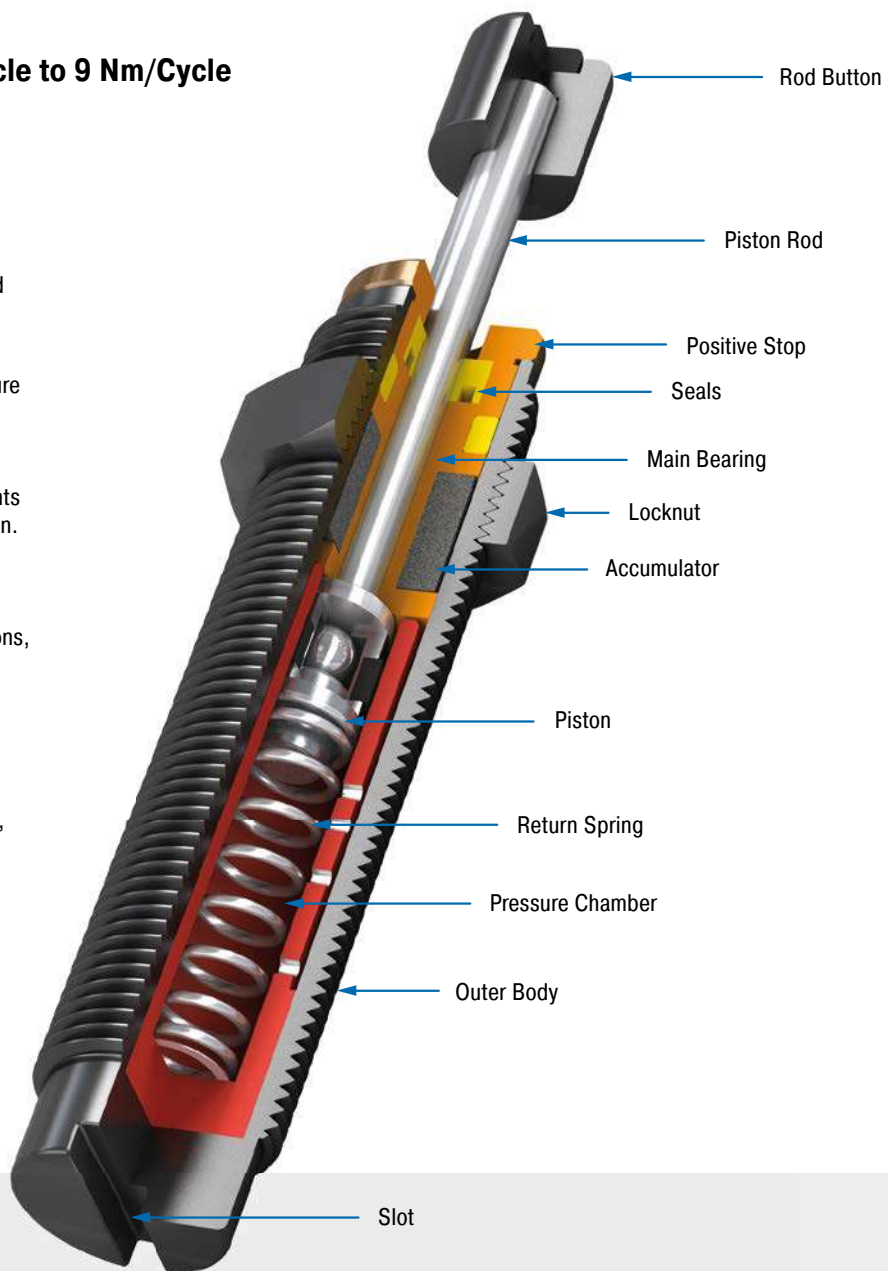
Energy capacity 0.68 Nm/Cycle to 9 Nm/Cycle

Stroke 4 mm to 10 mm

Ideal for compact, efficient designs: The miniature size of the product family MC5 to MC75 delivers very short overall lengths and low return forces.

The outer body of each shock, produced from one solid piece, is filled with temperature stable oil, offers a continuous outer body thread including a supplied lock nut and also has an integrated positive stop. These maintenance-free hydraulic machine elements from ACE are ready for immediate installation. A wide range of energy absorption and effective weight are further benefits in these compact units. Self-compensating shock absorbers react to changing energy conditions, without adjustment.

These self-compensating miniature shock absorbers are perfectly suited to use in applications such as rotary actuators, automation, light industrial manufacturing, material handling and packaging equipment, medical, electronics and robotics.



Technical Data

Energy capacity: 0.68 Nm/Cycle to 9 Nm/Cycle

Impact velocity range: 0.15 m/s to 4 m/s

Operating temperature range: -10 °C to 66 °C

Mounting: In any position

Positive stop: Integrated

Material: Outer body, Accessories: Steel corrosion-resistant coating; Piston rod: Hardened stainless steel; Rod end button: Steel, MC25 and MC75: Elastomer Insert; Locknut: Steel, MC5 and MC9: Aluminium

Damping medium: Oil, temperature stable

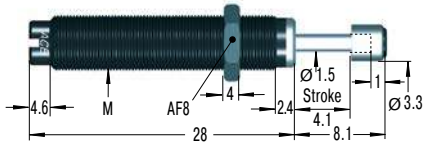
Application field: Miniature slides, Pneumatic cylinders, Handling modules, Copiers, Measuring tables, Machines and plants, Locking systems

Note: If precise end position data is required consider use of a stop collar.

Safety information: External materials in the surrounding area can attack the seal components and lead to a shorter service life. Please contact ACE for appropriate solution suggestions. Do not paint the shock absorbers due to heat emission.

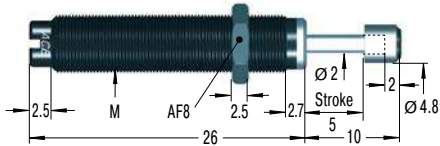
On request: Increased corrosion protection. Special finishes. Models without rod end button also available on request.

MC5M



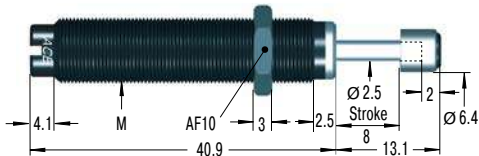
Standard version without button for MC5, MC9 and MC10

MC9M

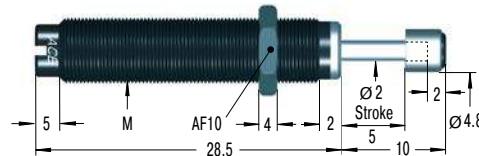


Standard version without button for MC5, MC9 and MC10

MC30M

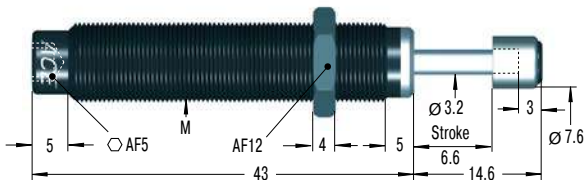


MC10M



Standard version without button for MC5, MC9 and MC10
M8x0.75 also available to order

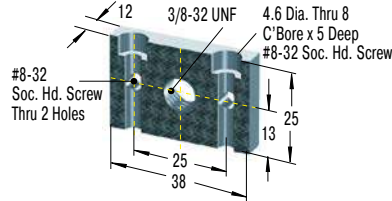
MC25



Product available for UNF and metric thread (for metric add suffix -M from part number)

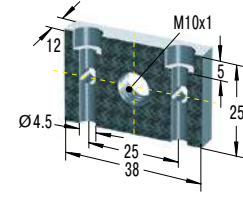
250-0306

Mounting Block

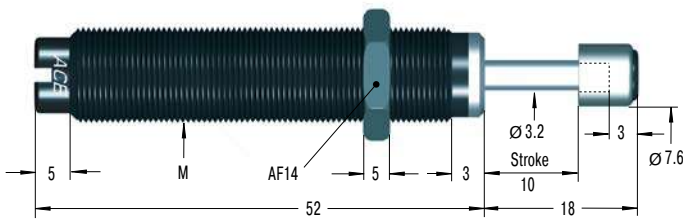


250-0307

Mounting Block



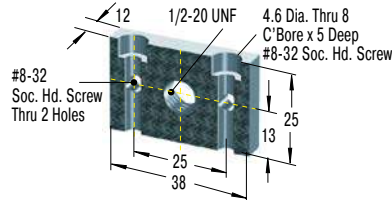
MC75



Product available for UNF and metric thread (for metric add suffix -M from part number)

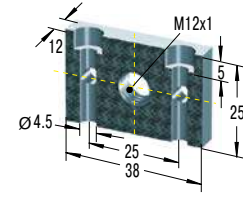
250-0308

Mounting Block



250-0309

Mounting Block



Additional accessories, mounting, installation ... starting on page 40.

Performance

TYPES	Max. Energy Capacity		Effective Weight		Return Force min.	Return Force max.	Return Time	Side Load Angle max. °	M	Weight kg
	E ₃ Nm/cycle	E ₄ Nm/h	We min. kg	We max. kg						
MC5M-1-B	0.68	2,040	0.5	4.4	1	5	0.2	2	M5x0.5	0.003
MC5M-2-B	0.68	2,040	3.8	10.8	1	5	0.2	2	M5x0.5	0.003
MC5M-3-B	0.68	2,040	9.7	18.7	1	5	0.2	2	M5x0.5	0.003
MC9M-1-B	1.00	2,000	0.6	3.2	2	4	0.3	2	M6x0.5	0.004
MC9M-2-B	1.00	2,000	0.8	4.1	2	4	0.3	2	M6x0.5	0.004
MC10MH-B	1.25	4,000	0.7	5.0	2	4	0.3	3	M8x1	0.008
MC10ML-B	1.25	4,000	0.3	2.7	2	4	0.3	3	M8x1	0.008
MC30M-1	3.50	5,600	0.4	1.9	2	6	0.3	2	M8x1	0.010
MC30M-2	3.50	5,600	1.8	5.4	2	6	0.3	2	M8x1	0.010
MC30M-3	3.50	5,600	5.0	15.0	2	6	0.3	2	M8x1	0.010
MC25	2.80	22,600	1.8	5.4	3	6	0.3	2	3/8-32 UNF / M10x1	0.020
MC25H	2.80	22,600	4.6	13.6	3	6	0.3	2	3/8-32 UNF / M10x1	0.020
MC25L	2.80	22,600	0.7	2.2	3	6	0.3	2	3/8-32 UNF / M10x1	0.020
MC75-1	9.00	28,200	0.3	1.1	4	9	0.3	2	1/2-20 UNF / M12x1	0.040
MC75-2	9.00	28,200	0.9	4.8	4	9	0.3	2	1/2-20 UNF / M12x1	0.040
MC75-3	9.00	28,200	2.7	36.2	4	9	0.3	2	1/2-20 UNF / M12x1	0.040
MC75-4	9.00	28,200	25	72	4	9	0.3	2	1/2-20 UNF / M12x1	0.040

¹ For applications with higher side load angles consider using the side load adaptor, pages 44 to 49.

MC150 to MC600

Exceptionally high endurance and with the lowest resetting force

Self-Compensating, Rolling Diaphragm Technology

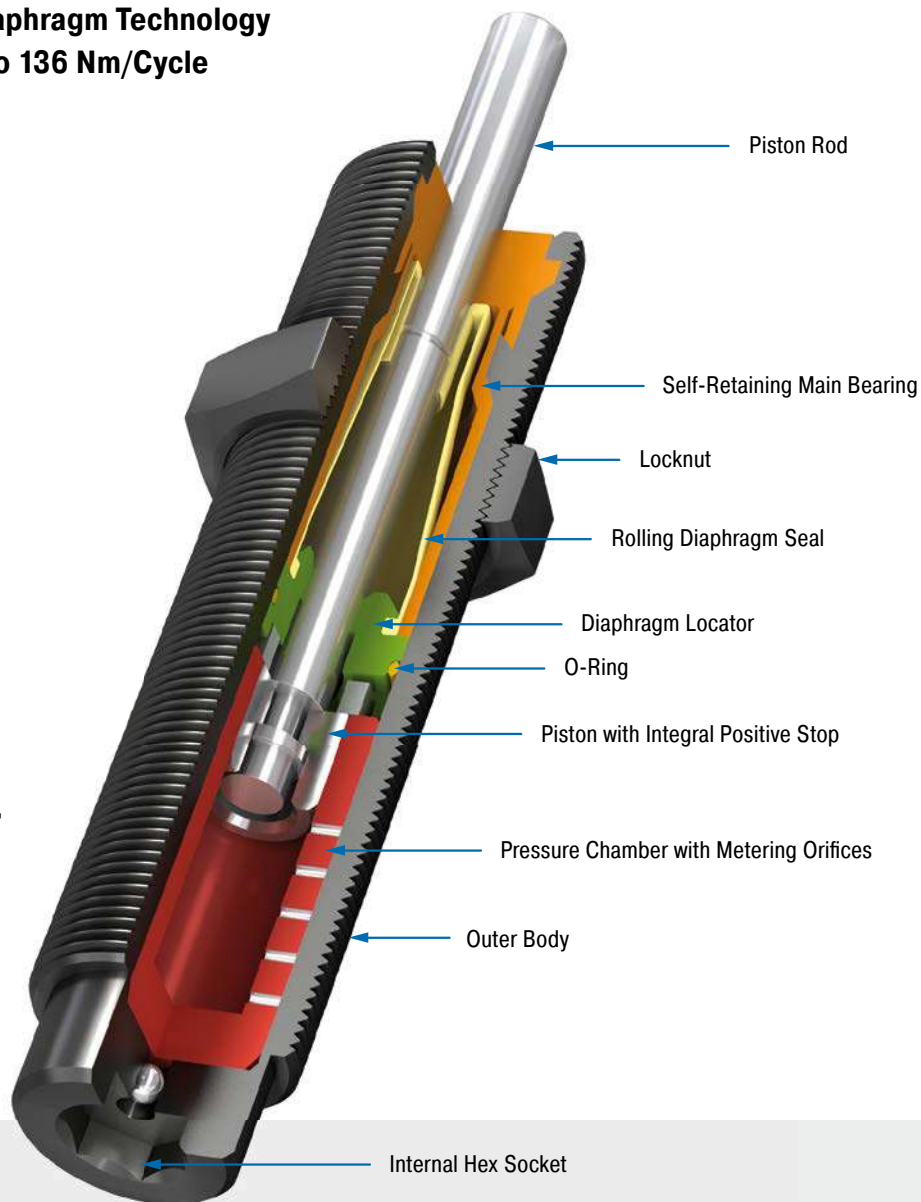
Energy capacity 20 Nm/Cycle to 136 Nm/Cycle

Stroke 12 mm to 25 mm

Tried-and-tested and durable: With a hermetically sealed rolling diaphragm in each absorber, the MC150 to MC600 product family is suitable for an exceptionally high lifetime of use with up to 25 million cycles. The rolling diaphragm technology perfected by ACE ensures complete separation of the damping fluid from the surrounding air. This makes it possible for direct installation in a pressure chamber to provide end stop damping in pneumatic cylinders up to approximately 7 bar (100 psi).

The rolling diaphragm delivers very low return forces for these maintenance-free, ready-to-install absorbers. An integrated positive stop and progressive energy capacities, with a wide range of effective weight, make these miniature shock absorbers a winner. Furthermore, the use of a side load adapter allows impact angles of up to 25°. Stainless steel options are available for greater environmental compatibility. Self-compensating shock absorbers react to changing energy conditions, without adjustment.

These self compensating miniature shock absorbers are capable of universal mounting even inside a cylinder. These shocks are ideal for use in multitude of applications including material handling equipment, packaging equipment, medium robotics and machine tools.



Technical Data

Energy capacity: 20 Nm/Cycle to 136 Nm/Cycle

Impact velocity range: 0.06 m/s to 6 m/s.
Other speeds on request.

Operating temperature range: 0 °C to 66 °C

Mounting: In any position

Positive stop: Integrated

Material: Outer body, Accessories: Steel corrosion-resistant coating; Main bearing: Plastic; Piston rod: Hardened stainless steel (1.4125, AISI 440C); Rolling diaphragm: EPDM

Damping medium: Oil, temperature stable

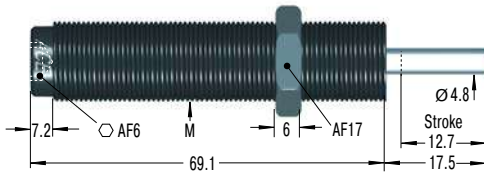
Application field: Linear slides, Pneumatic cylinders, Swivel units, Handling modules, Machines and plants, Finishing and processing centers, Measuring tables, Tool machines, Locking systems

Note: If precise end position data is required consider use of a stop collar.

Safety information: External materials in the surrounding area can attack the rolling seal and lead to a shorter service life. Please contact ACE for appropriate solution suggestions. Suitable for use in pressure chambers up to 7 bar.

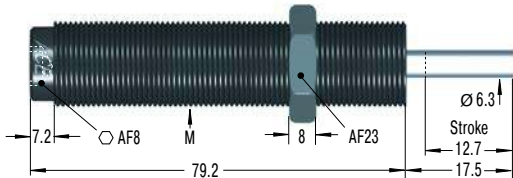
On request: Increased corrosion protection. Special threads or other special options.

MC150



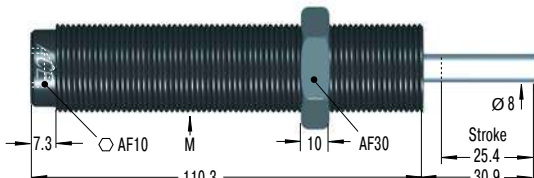
Product available for UNF and metric thread (for metric add suffix -M from part number)
M14x1 also available to special order

MC225



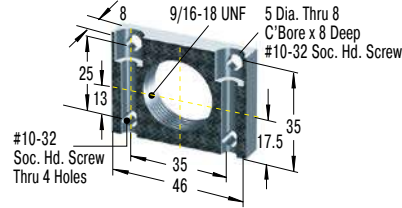
Product available for UNF and metric thread (for metric add suffix -M from part number)

MC600

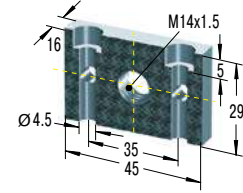


Product available for UNF and metric thread (for metric add suffix -M from part number)
M27x3 also available to special order

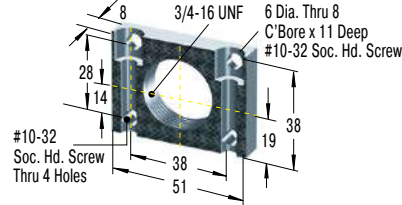
250-0318 Mounting Block



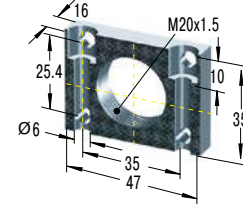
250-0352 Mounting Block



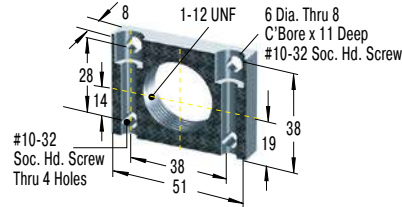
250-0401 Mounting Block



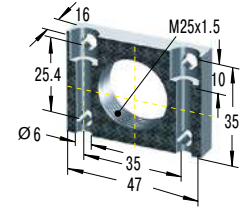
250-0353 Mounting Block



250-0402 Mounting Block



250-0044 Mounting Block



Additional accessories, mounting, installation ... starting on page 40.

Performance

TYPES	Max. Energy Capacity		Effective Weight		Return Force min.	Return Force max.	Return Time s	¹ Side Load Angle max.	M	Weight kg
	E ₃ Nm/cycle	E ₄ Nm/h	We min. kg	We max. kg						
MC150	20	34,000	0.9	10	3	8	0.4	4	9/16-18 UNF / M14x1.5	0.054
MC150H	20	34,000	8.6	86	3	8	0.4	4	9/16-18 UNF / M14x1.5	0.054
MC150H2	20	34,000	70	200	3	8	0.4	4	9/16-18 UNF / M14x1.5	0.054
MC150H3	20	34,000	181	408	3	8	1.0	4	9/16-18 UNF / M14x1.5	0.054
MC225	41	45,000	2.3	25	4	9	0.3	4	3/4-16 UNF / M20x1.5	0.154
MC225H	41	45,000	23	230	4	9	0.3	4	3/4-16 UNF / M20x1.5	0.154
MC225H2	41	45,000	180	910	4	9	0.3	4	3/4-16 UNF / M20x1.5	0.154
MC225H3	41	45,000	816	1,814	4	9	0.3	4	3/4-16 UNF / M20x1.5	0.154
MC600	136	68,000	9	136	5	10	0.6	2	1-12 UNF / M25x1.5	0.258
MC600H	136	68,000	113	1,130	5	10	0.6	2	1-12 UNF / M25x1.5	0.258
MC600H2	136	68,000	400	2,300	5	10	0.6	2	1-12 UNF / M25x1.5	0.258
MC600H3	136	68,000	2,177	4,536	5	10	0.6	2	1-12 UNF / M25x1.5	0.258

¹ For applications with higher side load angles consider using the side load adaptor, pages 44 to 49.

MC150-V4A to MC600-V4A

Exceptionally high endurance with stainless steel corrosion protection

Self-Compensating, Stainless Steel, Rolling Diaphragm Technology

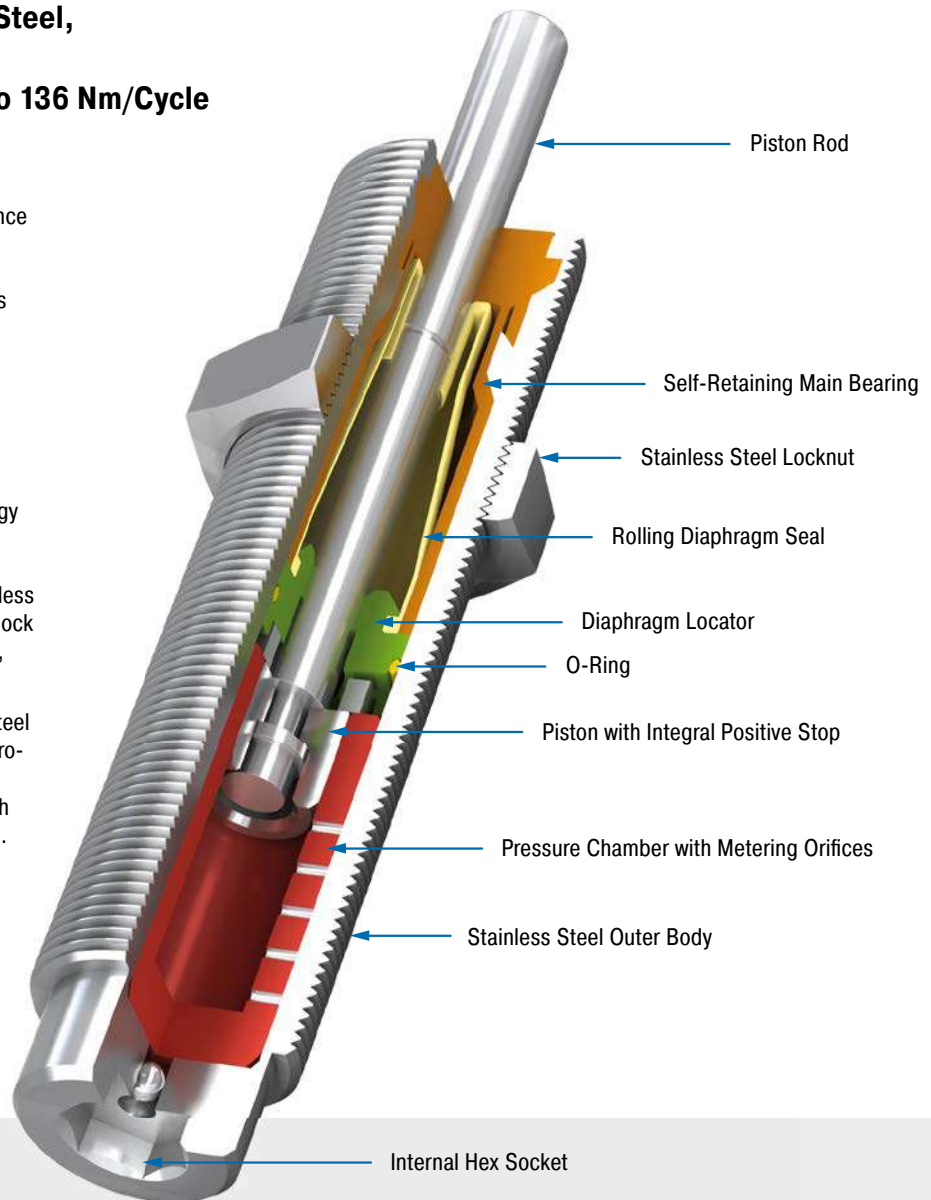
Energy capacity 20 Nm/Cycle to 136 Nm/Cycle

Stroke 12 mm to 25 mm

Brilliant in every respect: These high performance stainless steel miniature shock absorbers are based on the MC150 to MC600 product family and its proven damping technology. This means that these special absorbers offer all of the benefits of the standard units such as the ACE rolling diaphragm technology which delivers maximum service life and direct installation in a pressure chamber with up to approx. 100 psi (7 bar).

Thanks to perfectly progressive maximum energy absorption and effective weight potential, their use is augmented even further by the stainless steel outer body and a complete range of stainless steel accessories (AISI 316L). Self-compensating shock absorbers react to changing energy conditions, without adjustment.

These self-compensating miniature stainless steel shock absorbers are used in medical and electro-technology, as well as marine, packaging, and chemical applications. Shocks can be filled with food-grade oil for food processing applications.



Technical Data

Energy capacity: 20 Nm/Cycle to 136 Nm/Cycle

Impact velocity range: 0.06 m/s to 6 m/s.
Other speeds on request.

Operating temperature range: 0 °C to 66 °C

Mounting: In any position

Positive stop: Integrated

Material: Outer body, Locknut, Accessories: Stainless steel (1.4404, AISI 316L); Main bearing: Plastic; Piston rod: Hardened stainless steel (1.4125, AISI 440C); Rolling diaphragm: EPDM

Damping medium: Oil, temperature stable

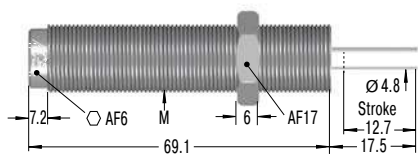
Application field: Clean room areas, Pharmaceutical industry, Medical technology, Food industry, Linear slides, Pneumatic cylinders, Handling modules, Machines and plants, Finishing and processing centers, Measuring tables

Note: If precise end position data is required consider use of a stop collar.

Safety information: External materials in the surrounding area can attack the rolling seal and lead to a shorter service life. Please contact ACE for appropriate solution suggestions. Suitable for use in pressure chambers up to 7 bar.

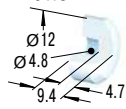
On request: Special oil with food approval. Special threads or other special options available on request.

MC150M-V4A



250-0753

Nylon Button



$E_3 \text{ max} = 14 \text{ Nm}$

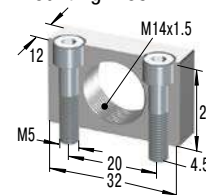
250-0441

Locknut

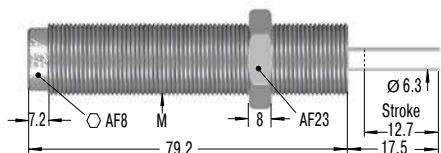


250-0255

Mounting Block

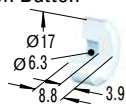


MC225M-V4A



250-0754

Nylon Button



$E_3 \text{ max} = 33 \text{ Nm}$

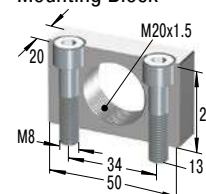
250-0442

Locknut

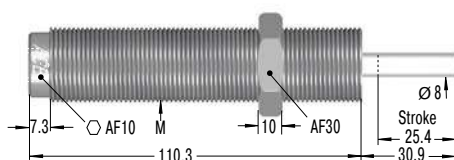


250-0434

Mounting Block

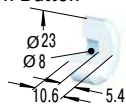


MC600M-V4A



250-0755

Nylon Button



$E_3 \text{ max} = 68 \text{ Nm}$

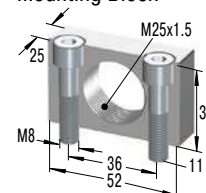
250-0443

Locknut



250-0436

Mounting Block



Additional accessories, mounting, installation ... starting on page 40.

Performance

TYPES	Max. Energy Capacity		Effective Weight		Return Force min. N	Return Force max. N	Return Time s	¹ Side Load Angle max. °	M	Weight kg
	E_3 Nm/cycle	E_4 Nm/h	We min. kg	We max. kg						
MC150M-V4A	20	34,000	0.9	10	3	5	0.4	4	M14x1.5	0.054
MC150MH-V4A	20	34,000	8.6	86	3	5	0.4	4	M14x1.5	0.054
MC150MH2-V4A	20	34,000	70	200	3	5	0.4	4	M14x1.5	0.054
MC150MH3-V4A	20	34,000	181	408	3	5	1.0	4	M14x1.5	0.054
MC225M-V4A	41	45,000	2.3	25	4	6	0.3	4	M20x1.5	0.154
MC225MH-V4A	41	45,000	23	230	4	6	0.3	4	M20x1.5	0.154
MC225MH2-V4A	41	45,000	180	910	4	6	0.3	4	M20x1.5	0.154
MC225MH3-V4A	41	45,000	816	1,814	4	6	0.3	4	M20x1.5	0.154
MC600M-V4A	136	68,000	9	136	5	9	0.6	2	M25x1.5	0.258
MC600MH-V4A	136	68,000	113	1,130	5	9	0.6	2	M25x1.5	0.258
MC600MH2-V4A	136	68,000	400	2,300	5	9	0.6	2	M25x1.5	0.258
MC600MH3-V4A	136	68,000	2,177	4,536	5	9	0.6	2	M25x1.5	0.258

¹ For applications with higher side load angles please contact ACE.

PMCN150 to PMCN600

Reliable protection from fluids and particulate

Self-Compensating, Rolling Diaphragm Technology, TPU Bellow

Energy capacity 20 Nm/Cycle to 136 Nm/Cycle

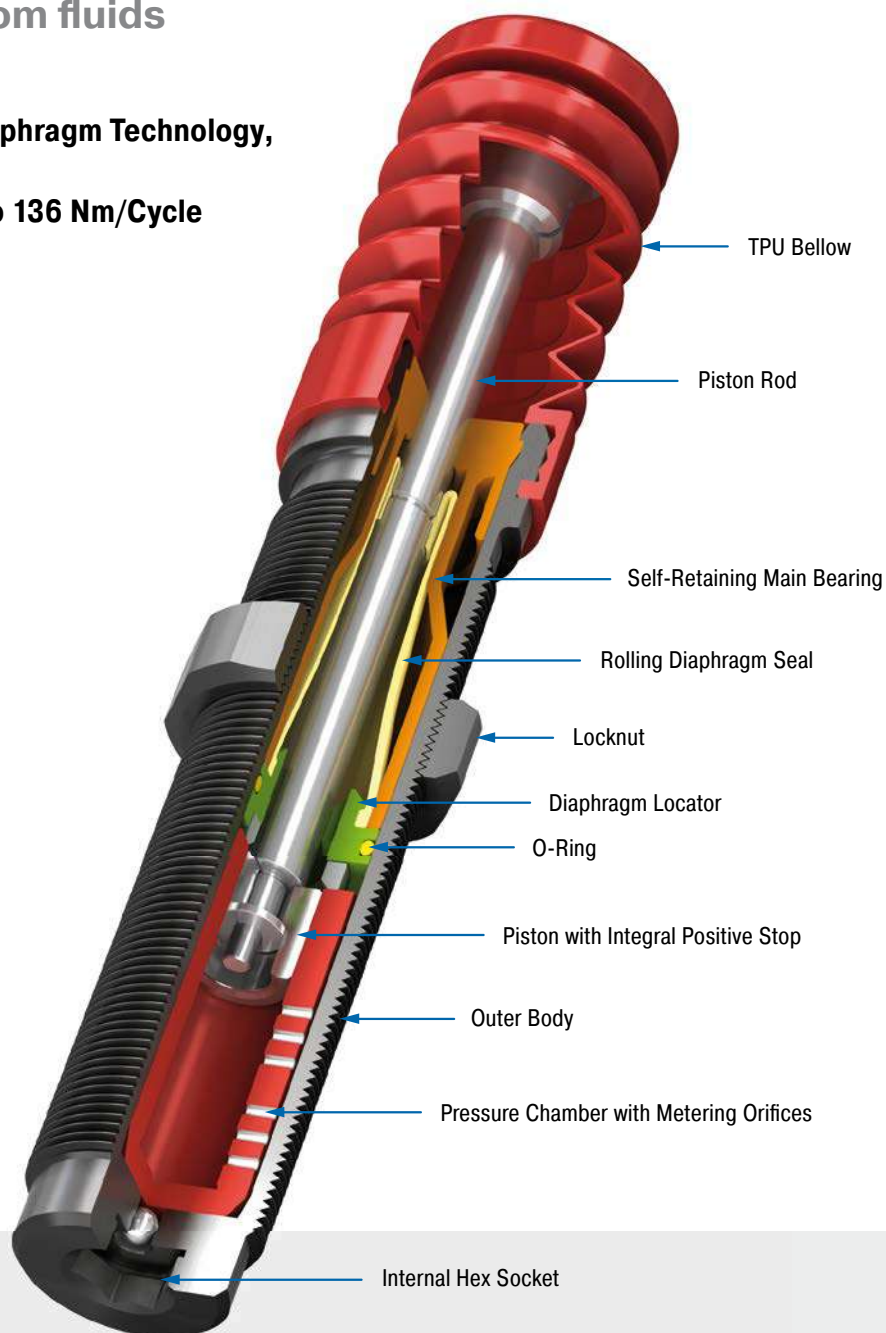
Stroke 12 mm to 25 mm

Hermetically sealed: The shock absorbers from the ACE Protection family PMCN have a compact, perfectly sealed cap as a special feature.

This protection bellows, made of TPU (thermoplastic polyurethane), safely encapsulates the proven ACE rolling diaphragm from the outside environment. Aggressive cutting, lubricating and cleaning agents don't stand a chance and the function of the maintenance-free, ready-to-install shock absorber is retained. They are also available in full stainless steel.

The PMCN range is a good alternative to the SP type air bleed collar if no compressed air is available on the machine or system.

Reliable protection against aggressive environments including fluids and abrasives, these self-compensating miniature shock absorbers are the first choice where conventional dampers wear out too quickly. Use them in harsh environments where cutting, cooling or cleaning agents can attack.



Technical Data

Energy capacity: 20 Nm/Cycle to 136 Nm/Cycle

Impact velocity range: 0.06 m/s to 6 m/s.
Other speeds on request.

Operating temperature range: 0 °C to 66 °C

Mounting: In any position

Positive stop: Integrated

Material: Outer body: Steel corrosion-resistant coating; Main bearing: Plastic; Piston rod: Hardened stainless steel (1.4125, AISI 440C); Bellow: TPU, steel insert: Stainless steel (1.4404/1.4571, AISI 316L/316Ti); Rolling diaphragm: EPDM

Damping medium: Oil, temperature stable

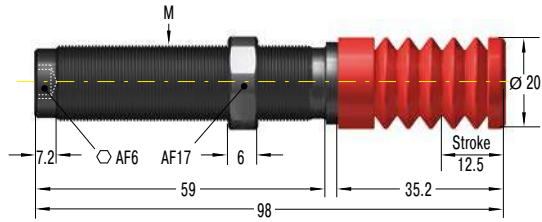
Application field: Finishing and processing centers, Clean room areas, Pharmaceutical industry, Medical technology, Food industry, Linear slides, Pneumatic cylinders, Machines and plants

Note: Final preliminary test must be done on the application.

Safety information: Do not paint the shock absorbers due to heat emission.

On request: Special accessories available on request.

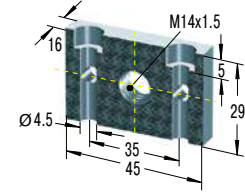
PMCN150M



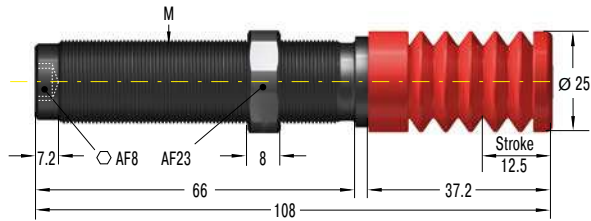
250-0233 Locknut



250-0352 Mounting Block



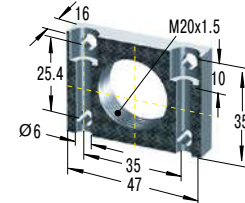
PMCN225M



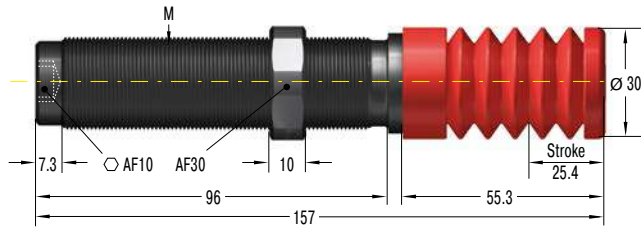
250-0207 Locknut



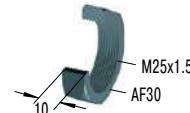
250-0353 Mounting Block



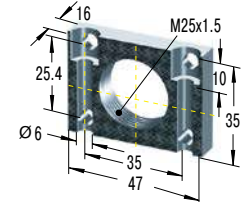
PMCN600M



250-0040 Locknut



250-0044 Mounting Block



Additional accessories, mounting, installation ... starting on page 40.

Performance

TYPES	Max. Energy Capacity		Effective Weight		Return Force min.	Return Force max.	Return Time	Side Load Angle max. °	M	Weight kg
	E ₃ Nm/cycle	E ₄ Nm/h	We min. kg	We max. kg						
PMCN150M	20	34,000	0.9	10	8	80	0.4	4	M14x1.5	0.067
PMCN150MH	20	34,000	8.6	86	8	80	0.4	4	M14x1.5	0.067
PMCN150MH2	20	34,000	70	200	8	80	0.4	4	M14x1.5	0.067
PMCN150MH3	20	34,000	181	408	8	80	1.0	4	M14x1.5	0.067
PMCN225M	41	45,000	2.3	25	8	85	0.3	4	M20x1.5	0.170
PMCN225MH	41	45,000	23	230	8	85	0.3	4	M20x1.5	0.170
PMCN225MH2	41	45,000	180	910	8	85	0.3	4	M20x1.5	0.170
PMCN225MH3	41	45,000	816	1,814	8	85	0.3	4	M20x1.5	0.170
PMCN600M	136	68,000	9	136	8	90	0.6	2	M25x1.5	0.317
PMCN600MH	136	68,000	113	1,130	8	90	0.6	2	M25x1.5	0.317
PMCN600MH2	136	68,000	400	1,043	8	90	0.6	2	M25x1.5	0.317
PMCN600MH3	136	68,000	2,177	4,536	8	90	0.6	2	M25x1.5	0.317

PMCN150-V4A to PMCN600-V4A

Optimum corrosion protection

Self-Compensating, Rolling Diaphragm Technology, TPU Bellow

Energy capacity 20 Nm/Cycle to 136 Nm/Cycle

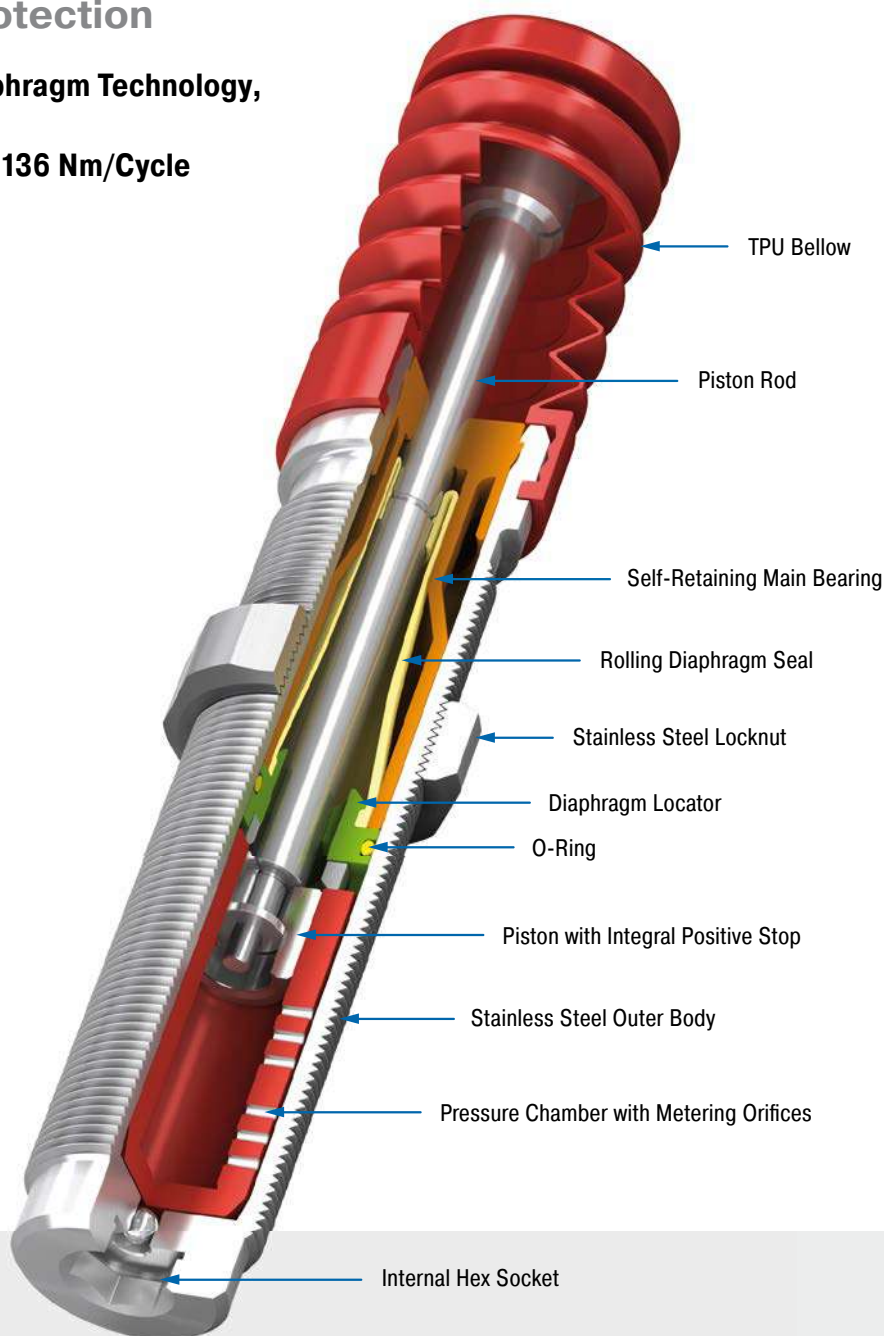
Stroke 12 mm to 25 mm

Hermetically sealed and rustproof: The Protection product family PMCN is also available in a stainless steel design. This is of particular interest to the food and packaging industries.

Their main feature is the compact, totally sealed bellow between the body and the cap made of TPU (thermoplastic polyurethane). This protection safely encapsulates the ACE rolling diaphragm from the outside environment. Aggressive fluids don't stand a chance.

The PMCN range is an excellent alternative if the accessory option of the SP type air bleed collar cannot be used due to a lack of compressed air.

The PMCN range self-compensating miniature shock absorbers, produced from stainless steel, are primarily suitable for use in the food industry, but are also wherever a high-quality appearance is important e.g. in shipbuilding.



Technical Data

Energy capacity: 20 Nm/Cycle to 136 Nm/Cycle

Impact velocity range: 0.06 m/s to 6 m/s.
Other speeds on request.

Operating temperature range: 0 °C to 66 °C

Mounting: In any position

Positive stop: Integrated

Material: Outer body: Stainless steel (1.4404, AISI 316L); Main bearing: Plastic; Piston rod: Hardened stainless steel (1.4125, AISI 440C); Bellow: TPU, steel insert: Stainless steel (1.4404/1.4571, AISI 316L/316Ti); Rolling diaphragm: EPDM

Damping medium: Oil, temperature stable

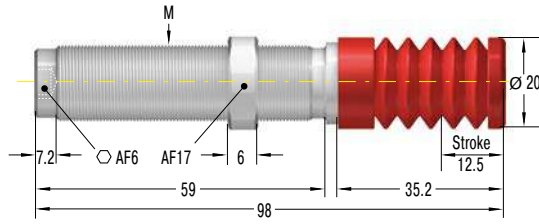
Application field: Finishing and processing centers, Clean room areas, Pharmaceutical industry, Medical technology, Food industry, Machines and plants

Note: Final preliminary test must be done on the application.

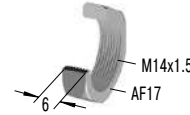
Safety information: Do not paint the shock absorbers due to heat emission.

On request: Special accessories available on request.

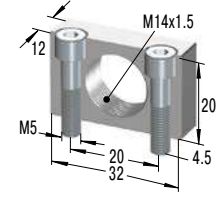
PMCN150M-V4A



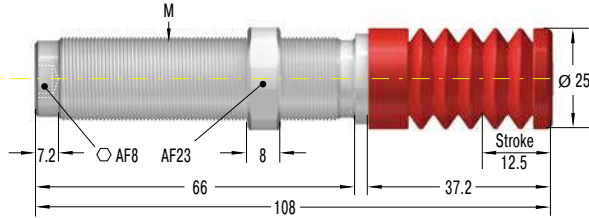
250-0441 Locknut



250-0255 Mounting Block



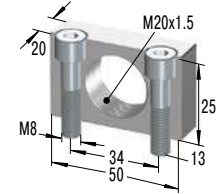
PMCN225M-V4A



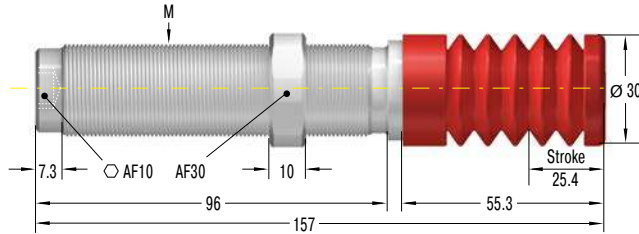
250-0442 Locknut



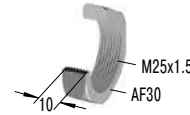
250-0434 Mounting Block



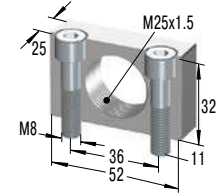
PMCN600M-V4A



250-0443 Locknut



250-0436 Mounting Block



Additional accessories, mounting, installation ... starting on page 40.

Performance

TYPES	Max. Energy Capacity		Effective Weight		Return Force min.	Return Force max.	Return Time s	Side Load Angle max. °	M	Weight kg
	E ₃ Nm/cycle	E ₄ Nm/h	We min. kg	We max. kg						
PMCN150M-V4A	20	34,000	0.9	10	8	80	0.4	4	M14x1.5	0.067
PMCN150MH-V4A	20	34,000	8.6	86	8	80	0.4	4	M14x1.5	0.067
PMCN150MH2-V4A	20	34,000	70	200	8	80	0.4	4	M14x1.5	0.067
PMCN150MH3-V4A	20	34,000	181	408	8	80	1.0	4	M14x1.5	0.067
PMCN225M-V4A	41	45,000	2.3	25	8	85	0.3	4	M20x1.5	0.170
PMCN225MH-V4A	41	45,000	23.0	230	8	85	0.3	4	M20x1.5	0.170
PMCN225MH2-V4A	41	45,000	180.0	910	8	85	0.3	4	M20x1.5	0.170
PMCN225MH3-V4A	41	45,000	816.0	1,814	8	85	0.3	4	M20x1.5	0.170
PMCN600M-V4A	136	68,000	9.0	136	8	90	0.6	2	M25x1.5	0.317
PMCN600MH-V4A	136	68,000	113.0	1,130	8	90	0.6	2	M25x1.5	0.317
PMCN600MH2-V4A	136	68,000	400	2,300	8	90	0.6	2	M25x1.5	0.317
PMCN600MH3-V4A	136	68,000	2,177.0	4,536	8	90	0.6	2	M25x1.5	0.317

SC190 to SC925

Long stroke and soft impact

Self-Compensating, Soft-Contact

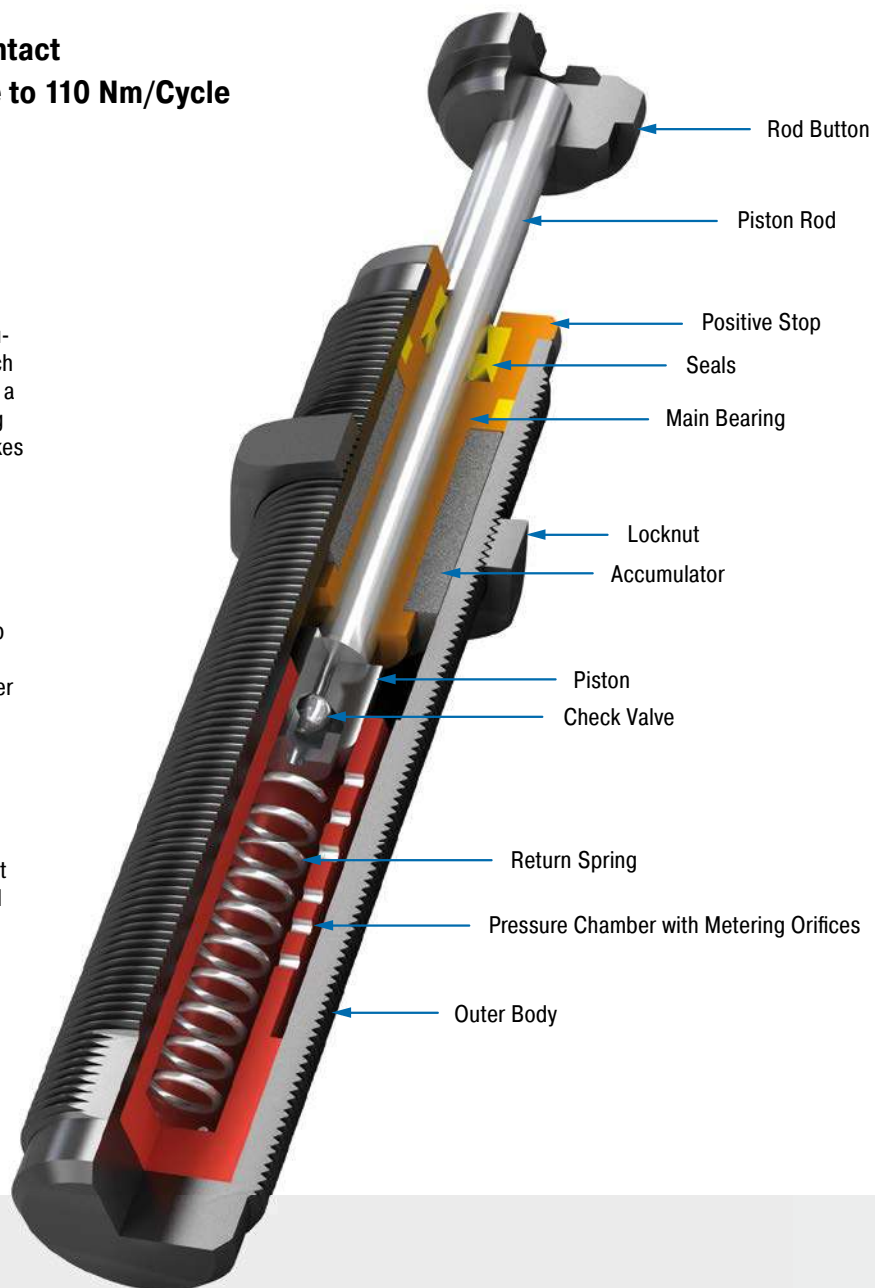
Energy capacity 25 Nm/Cycle to 110 Nm/Cycle

Stroke 16 mm to 40 mm

Ideal for soft damping: the SC found in the model code from the ACE product family SC190 to SC925 stands for 'soft contact'. These miniature shock absorbers manufactured from one solid piece are designed in such a way that they can be setup with a linear or a progressive braking curve. The soft damping character is thanks to the special, long strokes which produce smooth deceleration and low reaction forces.

These maintenance-free, ready-to-install hydraulic machine elements are equipped with an integrated positive stop. The use of side load adapter allows impact angles of up to 25°. Thanks to the designed overlapping effective weight ranges, these dampers cover an effective load range of 1 kg to 2,000 kg! Self-compensating shock absorbers react to changing energy conditions, without adjustment.

These miniature self-compensating shock absorbers from the SC190 to SC925 product family are used in industrial, automation and machine engineering and primarily in the areas of handling and automation.



Technical Data

Energy capacity: 25 Nm/Cycle to 110 Nm/Cycle

Impact velocity range: 0.15 m/s to 3.66 m/s. Other speeds on request.

Operating temperature range: 0 °C to 66 °C

Mounting: In any position

Positive stop: Integrated

Material: Outer body, Accessories: Steel corrosion-resistant coating; Piston rod: Hardened stainless steel

Damping medium: Oil, temperature stable

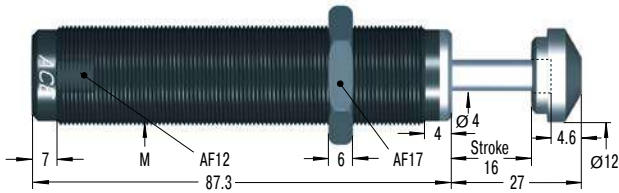
Application field: Linear slides, Pneumatic cylinders, Handling modules, Machines and plants, Finishing and processing centers, Measuring tables, Tool machines

Note: If precise end position data is required consider use of a stop collar.

Safety information: External materials in the surrounding area can attack the seal components and lead to a shorter service life. Please contact ACE for appropriate solution suggestions. Do not paint the shock absorbers due to heat emission.

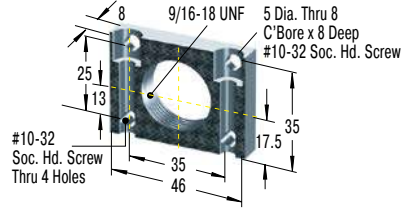
On request: Nickel-plated or weartec finish (seawater resistant) or other special finishes available to special order. Models without rod end button.

SC190; 0 to 4

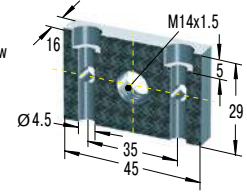


Product available for UNF and metric thread (for metric add suffix -M from part number)
M14x1 and M16x1 also available to special order

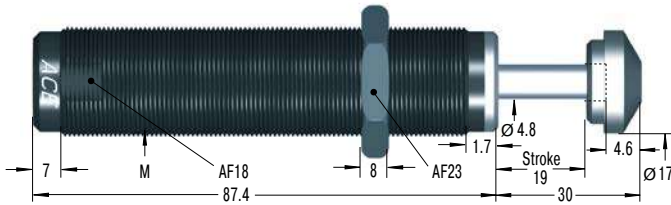
250-0318 Mounting Block



250-0352 Mounting Block

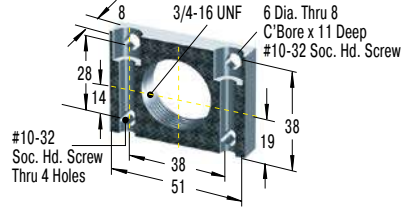


SC300; 0 to 4

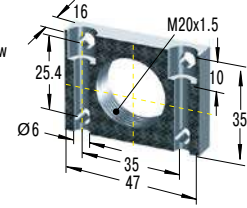


Product available for UNF and metric thread (for metric add suffix -M from part number)
M22x1.5 also available to special order

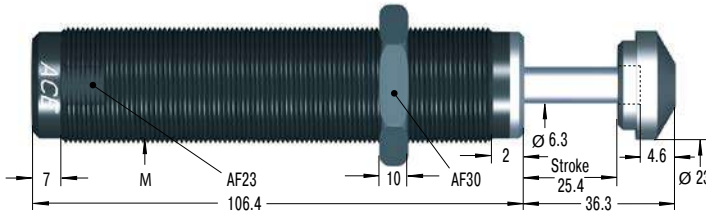
250-0401 Mounting Block



250-0353 Mounting Block

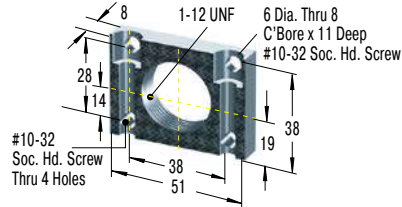


SC650; 0 to 4

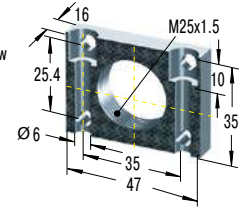


Product available for UNF and metric thread (for metric add suffix -M from part number)
M26x1.5 also available to special order

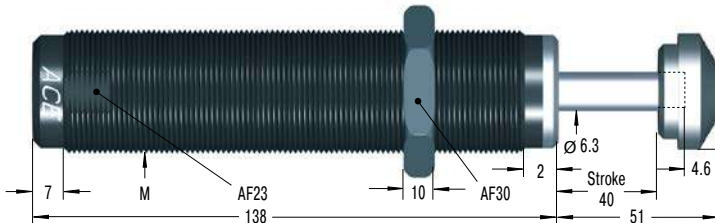
250-0402 Mounting Block



250-0044 Mounting Block

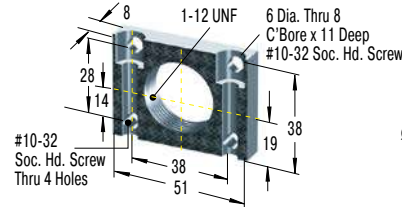


SC925; 0 to 4

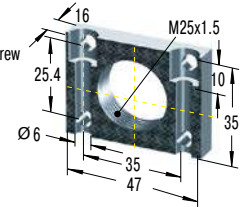


Product available for UNF and metric thread (for metric add suffix -M from part number)

250-0402 Mounting Block



250-0044 Mounting Block



Additional accessories, mounting, installation ... starting on page 40.

Performance

TYPES	Max. Energy Capacity		Effective Weight					Hardness	Return Force min. N	Return Force max. N	Return Time s	1 Side Load Angle max. °	M	Weight kg
	E ₃ Nm/cycle	E ₄ Nm/h	Soft-Contact		Self-Compensating									
			me min. kg	me max. kg	me min. kg	me max. kg								
SC190-0	25	34,000	-	-	0.7	4	-0	4	9	0.25	5	9/16-18 UNF / M14x1.5	0.080	
SC190-1	25	34,000	2.3	6	1.4	7	-1	4	9	0.25	5	9/16-18 UNF / M14x1.5	0.080	
SC190-2	25	34,000	5.5	16	3.6	18	-2	4	9	0.25	5	9/16-18 UNF / M14x1.5	0.080	
SC190-3	25	34,000	14	41	9	45	-3	4	9	0.25	5	9/16-18 UNF / M14x1.5	0.080	
SC190-4	25	34,000	34	91	23	102	-4	4	9	0.25	5	9/16-18 UNF / M14x1.5	0.080	
SC300-0	33	45,000	-	-	0.7	4	-0	5	10	0.1	5	3/4-16 UNF / M20x1.5	0.175	
SC300-1	33	45,000	2.3	7	1.4	8	-1	5	10	0.1	5	3/4-16 UNF / M20x1.5	0.175	
SC300-2	33	45,000	7	23	4.5	27	-2	5	10	0.1	5	3/4-16 UNF / M20x1.5	0.175	
SC300-3	33	45,000	23	68	14	82	-3	5	10	0.1	5	3/4-16 UNF / M20x1.5	0.175	
SC300-4	33	45,000	68	181	32	204	-4	5	10	0.1	5	3/4-16 UNF / M20x1.5	0.175	
SC650-0	73	68,000	-	-	2.3	14	-0	11	32	0.20	5	1-12 UNF / M25x1.5	0.335	
SC650-1	73	68,000	11	36	8	45	-1	11	32	0.20	5	1-12 UNF / M25x1.5	0.335	
SC650-2	73	68,000	34	113	23	136	-2	11	32	0.20	5	1-12 UNF / M25x1.5	0.335	
SC650-3	73	68,000	109	363	68	408	-3	11	32	0.20	5	1-12 UNF / M25x1.5	0.335	
SC650-4	73	68,000	363	1,089	204	1,180	-4	11	32	0.20	5	1-12 UNF / M25x1.5	0.335	
SC925-0	110	90,000	8	25	4.5	29	-0	11	32	0.40	5	1-12 UNF / M25x1.5	0.420	
SC925-1	110	90,000	22	72	14	90	-1	11	32	0.40	5	1-12 UNF / M25x1.5	0.420	
SC925-2	110	90,000	59	208	40	227	-2	11	32	0.40	5	1-12 UNF / M25x1.5	0.420	
SC925-3	110	90,000	181	612	113	726	-3	11	32	0.40	5	1-12 UNF / M25x1.5	0.420	
SC925-4	110	90,000	544	1,952	340	2,088	-4	11	32	0.40	5	1-12 UNF / M25x1.5	0.420	

¹ For applications with higher side load angles consider using the side load adaptor, pages 44 to 49.

SC²25 to SC²190

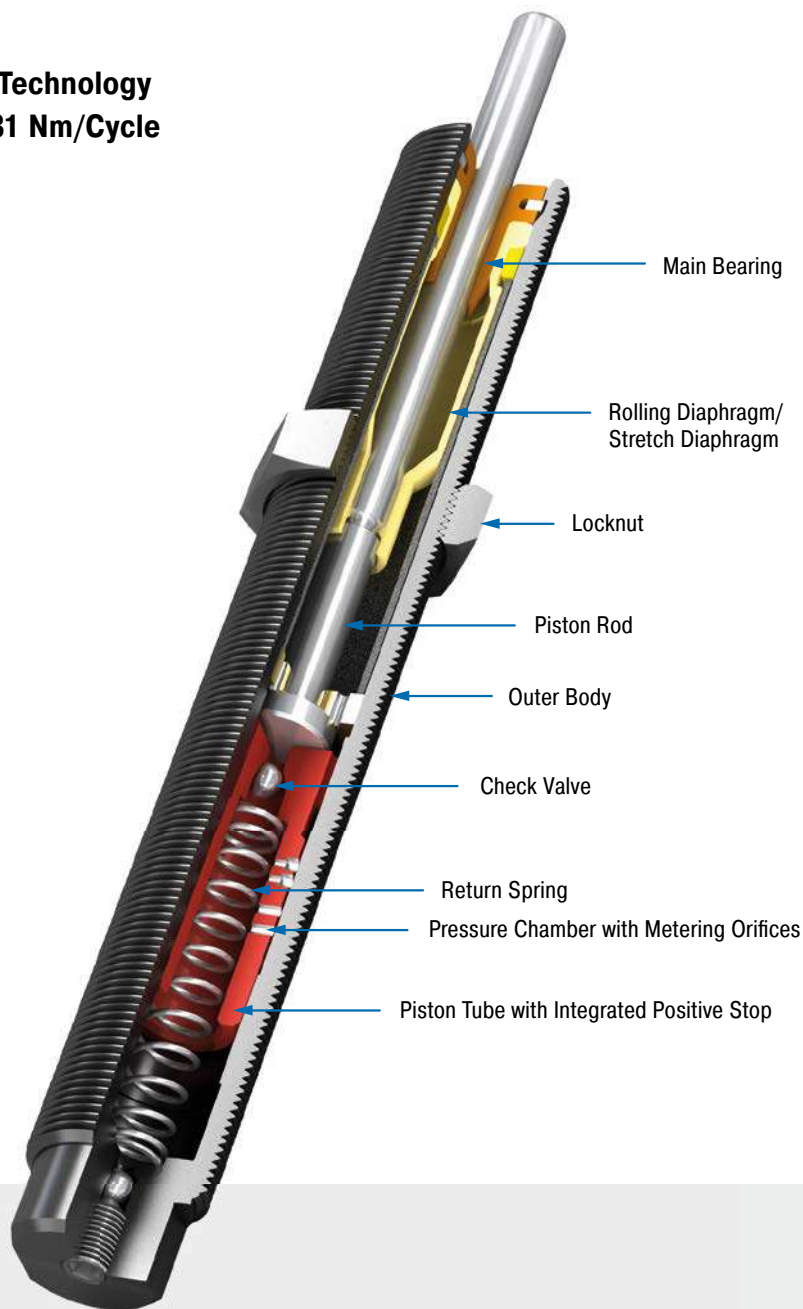
Piston tube design for maximum energy absorption

Self-Compensating, Piston Tube Technology Energy capacity 10 Nm/Cycle to 31 Nm/Cycle Stroke 8 mm to 12 mm

Soft damping, but enormous capacity: The range of 'soft contact' absorbers SC²25 to SC²190 extends from thread size M10 to M14 and covers effective weight ranges of 1 kg to 1,550 kg (2.2 to 3,400 lbs). All models are characterised by high energy absorption and they also unite the piston tube technology with the diaphragm seal perfected by ACE. This enables direct installation as end position damping in pneumatic cylinders at 5 to 7 bar (72 to 102 psi) or applications where deceleration needs to take place close to the pivot point.

They are maintenance-free, have an integrated positive stop and are mountable in any position. The option of a side load adapter allows impact angles of up to 25°. They offer soft contact deceleration where initial impact reaction forces are very low, with the advantages of self-compensation to react to changing energy conditions, without adjustment.

Thanks to their robust design and their durability, these miniature shock absorbers can be used for a wide range of applications. Designers mainly use them for pick and place systems, pneumatic rotary modules and in automation applications.



Technical Data

Energy capacity: 10 Nm/Cycle to 31 Nm/Cycle

Impact velocity range: 0.1 m/s to 5.7 m/s. Other speeds on request.

Operating temperature range: 0 °C to 66 °C

Mounting: In any position

Positive stop: Integrated

Material: Outer body, Accessories: Steel corrosion-resistant coating; Piston rod: Hardened stainless steel; Rolling diaphragm: SC²190: EPDM; Stretch diaphragm: SC²25 and SC²75: Nitrile

Damping medium: Oil, temperature stable

Application field: Linear slides, Pneumatic cylinders, Swivel units, Handling modules, Machines and plants, Finishing and processing centers, Measuring tables, Tool machines, Locking systems

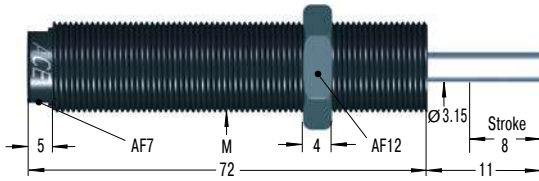
Note: If precise end position data is required consider use of a stop collar.

Safety information: External materials in the surrounding area can attack the rolling and stretch seals and lead to a shorter service life. Please contact ACE for appropriate solution suggestions.

On request: Increased corrosion protection. Special finishes.

Self-Compensating, Piston Tube Technology

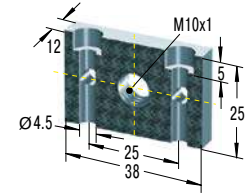
SC25M; 5 to 7



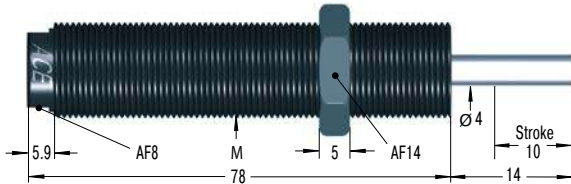
250-0315 Locknut



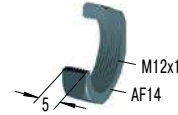
250-0307 Mounting Block



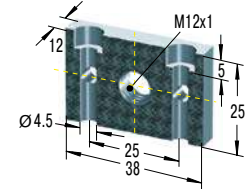
SC75M; 5 to 7



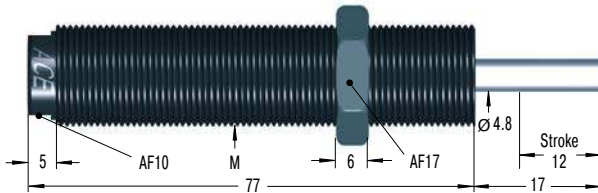
250-0317 Locknut



250-0309 Mounting Block

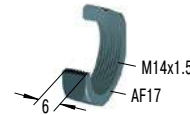


SC190M; 5 to 7

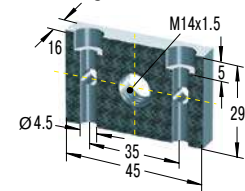


M14x1 also available to special order

250-0233 Locknut



250-0352 Mounting Block



Additional accessories, mounting, installation ... starting on page 40.

Performance

TYPES	Max. Energy Capacity		Effective Weight			Return Force min. N	Return Force max. N	Return Time s	Side Load Angle max. °	M	Weight kg
	E ₃ Nm/cycle	E ₄ Nm/h	We min. kg	We max. kg	Hardness						
SC25M-5	10	16,000	1	5	-5	4.5	14	0.3	2	M10x1	0.029
SC25M-6	10	16,000	4	44	-6	4.5	14	0.3	2	M10x1	0.029
SC25M-7	10	16,000	42	500	-7	4.5	14	0.3	2	M10x1	0.029
SC75M-5	16	30,000	1	8	-5	6	19	0.3	2	M12x1	0.047
SC75M-6	16	30,000	7	78	-6	6	19	0.3	2	M12x1	0.047
SC75M-7	16	30,000	75	800	-7	6	19	0.3	2	M12x1	0.047
SC190M-5	31	50,000	2	16	-5	6	19	0.4	2	M14x1.5	0.059
SC190M-6	31	50,000	13	140	-6	6	19	0.4	2	M14x1.5	0.059
SC190M-7	31	50,000	136	1,550	-7	6	19	0.4	2	M14x1.5	0.059

¹ For applications with higher side load angles consider using the side load adaptor, pages 44 to 49.

SC²300 to SC²650

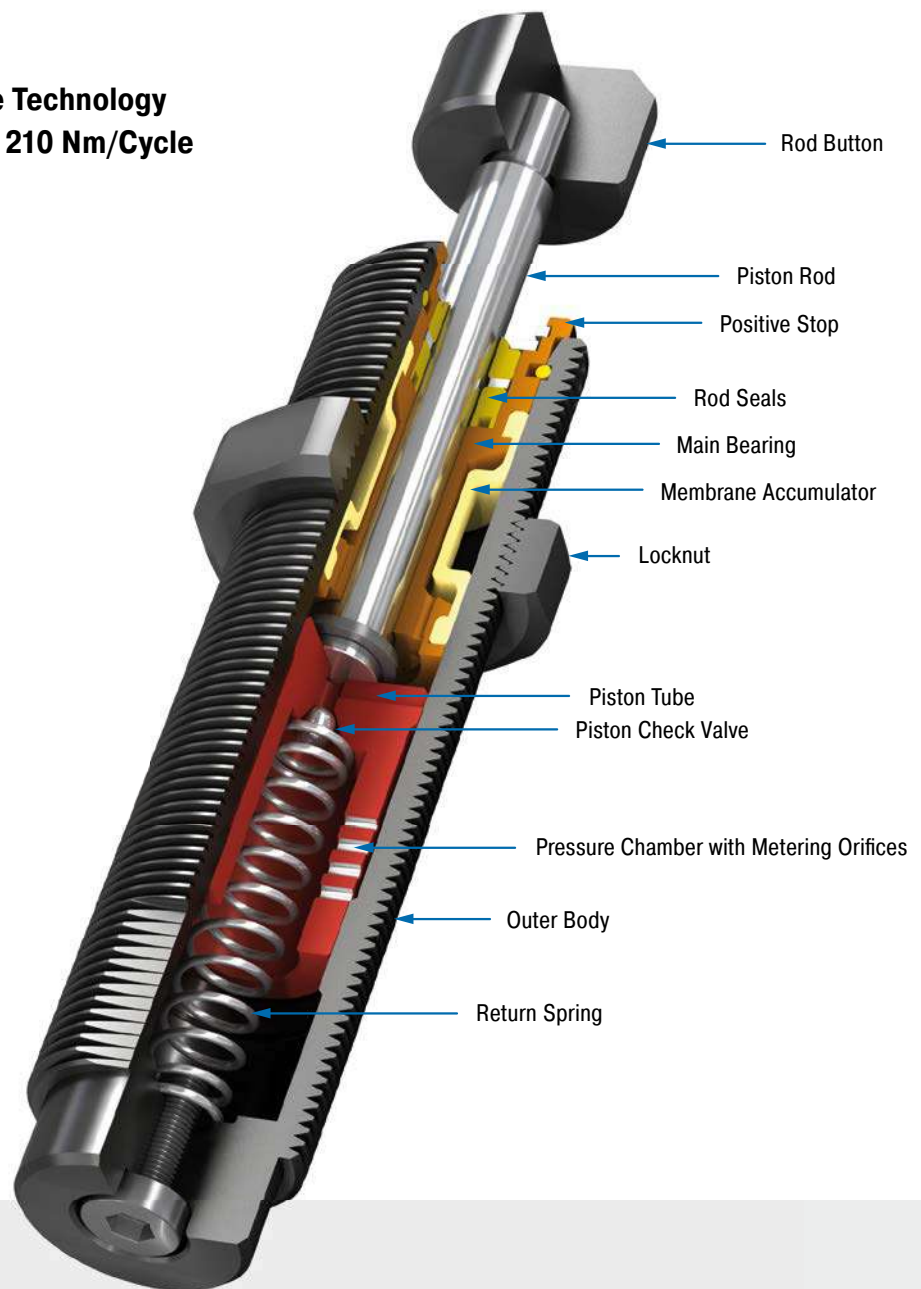
Piston tube design for maximum energy absorption

Self-Compensating, Piston Tube Technology
Energy capacity 73 Nm/Cycle to 210 Nm/Cycle
Stroke 15 mm to 23 mm

Added safety with accumulator technology: The larger 'soft contact' models from the SC²300 to SC²650 are available with up to three times the energy absorption compared to similar sizes of standard shock absorbers SC190 to SC925, due to the ACE piston tube specialty. Furthermore, the membrane accumulator serves as a compensation element for the oil displaced in the shock absorber and replaces the standard use of absorber materials. This increases process safety even further.

The shock absorbers, which are perfect for rotary actuators for example, are available in progressively stepped effective weight ranges with an integrated positive stop. They are maintenance-free and ready for direct installation. The side load adapter option allows impact angles of up to 25°. They offer soft contact deceleration where initial impact reaction forces are very low, with the advantages of self-compensation to react to changing energy conditions, without adjustment.

These miniature shock absorbers offer high performance levels with a long service life and are particularly popular for handling, mounting very close to pivots and automation tasks.



Technical Data

Energy capacity: 73 Nm/Cycle to 210 Nm/Cycle

Impact velocity range: 0.09 m/s to 3.66 m/s. Other speeds on request.

Operating temperature range: 0 °C to 66 °C

Mounting: In any position

Positive stop: Integrated

Material: Outer body: Steel corrosion-resistant coating; Piston rod: Hardened stainless steel; Accessories: Hardened steel and corrosion-resistant coating

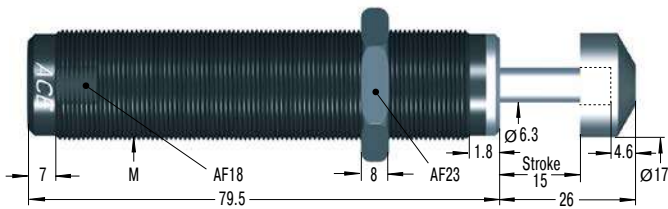
Damping medium: Oil, temperature stable

Application field: Turntables, Swivel units, Robot arms, Linear slides, Pneumatic cylinders, Handling modules, Machines and plants, Finishing and processing centers, Tool machines

Note: If precise end position data is required consider use of a stop collar.

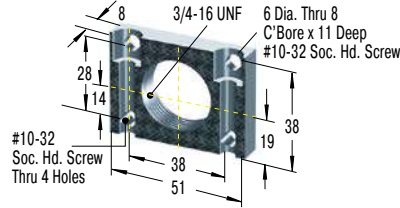
On request: Increased corrosion protection. Special finishes.

SC300; 5 to 9

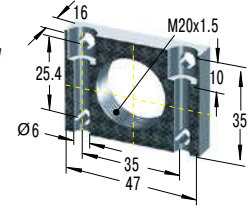


Product available for UNF and metric thread (for metric add suffix -M from part number)

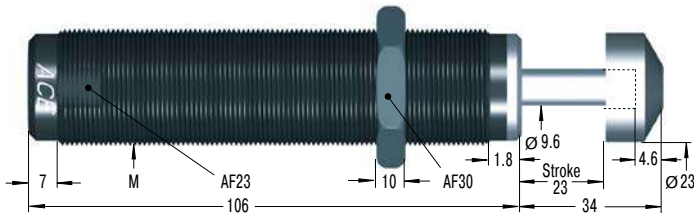
250-0401 Mounting Block



250-0353 Mounting Block

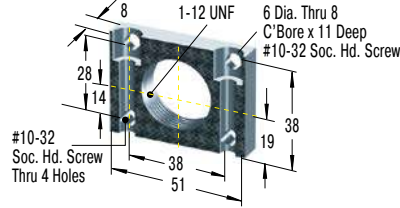


SC650; 5 to 9

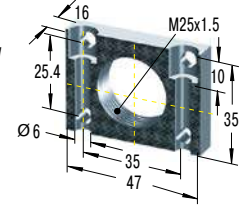


Product available for UNF and metric thread (for metric add suffix -M from part number)

250-0402 Mounting Block



250-0044 Mounting Block



Additional accessories, mounting, installation ... starting on page 40.

Performance

TYPES	Max. Energy Capacity		Effective Weight			Return Force min. N	Return Force max. N	Return Time s	1 Side Load Angle max. °	M	Weight kg
	E ₃ Nm/cycle	E ₄ Nm/h	We min. kg	We max. kg	Hardness						
SC300-5	73	45,000	11	45	-5	8	18	0.2	5	3/4-16 UNF / M20x1.5	0.150
SC300-6	73	45,000	34	136	-6	8	18	0.2	5	3/4-16 UNF / M20x1.5	0.150
SC300-7	73	45,000	91	181	-7	8	18	0.2	5	3/4-16 UNF / M20x1.5	0.150
SC300-8	73	45,000	135	680	-8	8	18	0.2	5	3/4-16 UNF / M20x1.5	0.150
SC300-9	73	45,000	320	1,950	-9	8	18	0.2	5	3/4-16 UNF / M20x1.5	0.150
SC650-5	210	68,000	23	113	-5	11	33	0.3	5	1-12 UNF / M25x1.5	0.310
SC650-6	210	68,000	90	360	-6	11	33	0.3	5	1-12 UNF / M25x1.5	0.310
SC650-7	210	68,000	320	1,090	-7	11	33	0.3	5	1-12 UNF / M25x1.5	0.310
SC650-8	210	68,000	770	2,630	-8	11	33	0.3	5	1-12 UNF / M25x1.5	0.310
SC650-9	210	68,000	1,800	6,350	-9	11	33	0.3	5	1-12 UNF / M25x1.5	0.310

¹ For applications with higher side load angles consider using the side load adaptor, pages 44 to 49.

SC25-HC to SC650-HC

Miniature self compensating shocks for high-speed applications

Self-Compensating

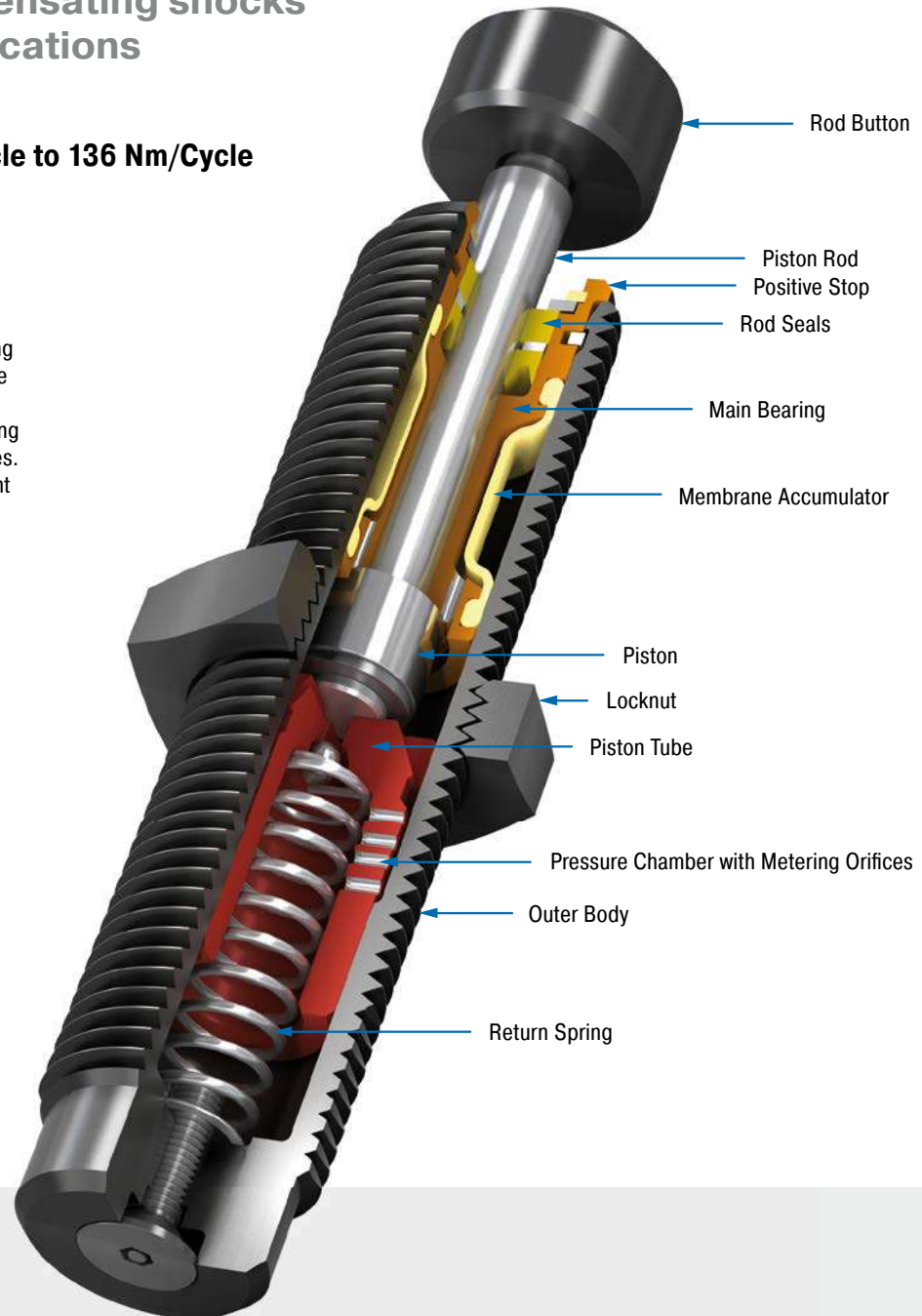
Energy capacity 2.25 Nm/Cycle to 136 Nm/Cycle

Stroke 4 mm to 15 mm

ACE Controls SC25-HC to SC650-HC High-Cycle shock absorbers are engineered for high-speed equipment applications. These rugged performers are ideal for the packaging industry. They offer a short stroke, quick time through stroke and quick rod-ready time. In addition, these dependable self-compensating miniatures are capable of rapid repeat strokes. The result is faster cycling for your equipment and gains in production time for you.

Self-compensating shock absorbers react to changing energy conditions, without adjustment.

These miniature, self-compensating shock absorbers provide high-speed performance and reliability in a compact footprint. Applications include: Packaging equipment, slides, rotary actuators, small and medium robotics, machine tools, pick and place operations and more.



Technical Data

Energy capacity: 2.25 Nm/Cycle to 136 Nm/Cycle

Impact velocity range: 0.03 m/s to 4.5 m/s.

Operating temperature range: 0 °C to 66 °C

Mounting: In any position

Positive stop: Integrated

Material: Outer body: Steel corrosion-resistant coating; Main bearing: Brass; Piston rod: Steel hardened; Locknut, Accessories: Steel; Rolling diaphragm: Rubber (EPDM); Stretch diaphragm: Rubber (nitrile)

Damping medium: SF 96-500 and others

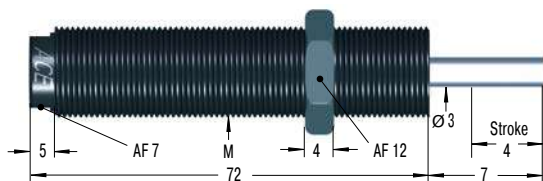
Application field: Linear slides, Tool machines, Handling modules, Production plants

Note: If precise end position is required, consider use of the optional stop collar.

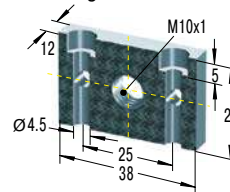
Safety information: External materials in the surrounding area can attack the accumulator and lead to a shorter service life. Please contact ACE for appropriate solution suggestions. Suitable for use in pressure chambers up to 102 psi.

On request: Food grade oils, special threads available on request.

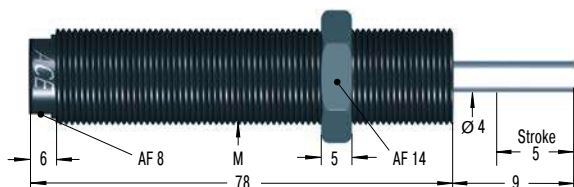
SC25M-HC



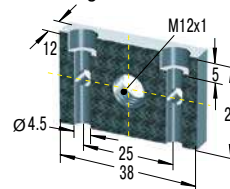
250-0307 Mounting Block



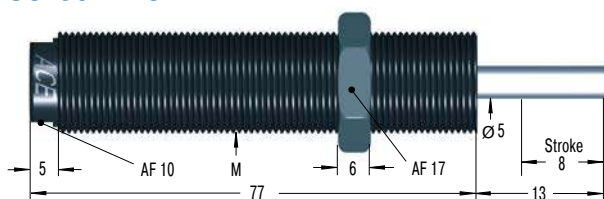
SC75M-HC



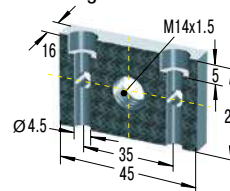
250-0309 Mounting Block



SC190M-HC

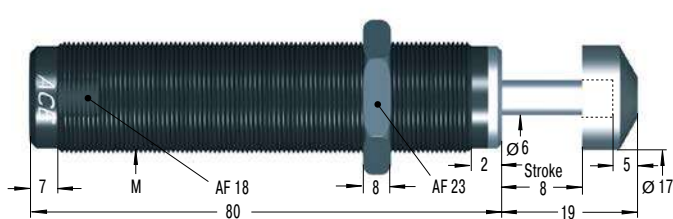


250-0352 Mounting Block

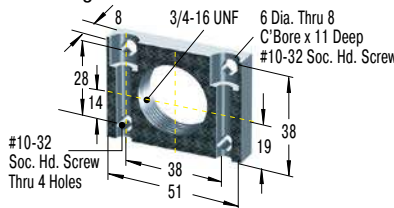


M14x1 also available to special order

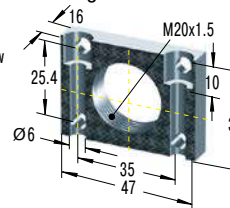
SC300-HC



250-0401 Mounting Block

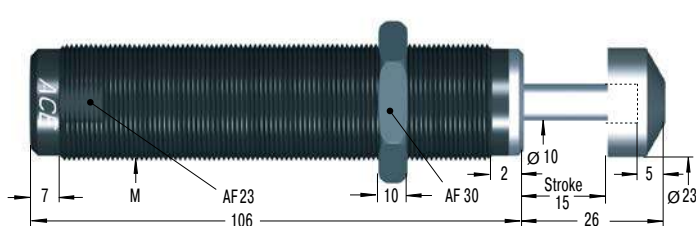


250-0353 Mounting Block

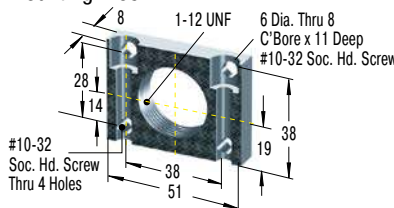


Product available for UNF and metric thread (for metric add suffix -M from part number)

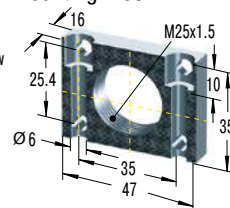
SC650-HC



250-0402 Mounting Block



250-0044 Mounting Block



Product available for UNF and metric thread (for metric add suffix -M from part number)

Additional accessories, mounting, installation ... starting on page 40.

Performance

TYPES	Max. Energy Capacity		Effective Weight		Return Force min.	Return Force max.	Return Time	Side Load Angle max.	M	Weight
	E ₃ Nm/cycle	Energy capacity Nm/h	We min. kg	We max. kg						
SC25M-5-HC	2.25	16,000	1	5	9	14	0.3	2	M10x1	0.030
SC25M-6-HC	2.25	16,000	4	44	9	14	0.3	2	M10x1	0.030
SC25M-7-HC	2.25	16,000	42	500	9	14	0.3	2	M10x1	0.030
SC75M-5-HC	8.5	30,000	1	8	8.5	15	0.3	2	M12x1	0.045
SC75M-6-HC	8.5	30,000	7	124	8.5	15	0.3	2	M12x1	0.045
SC75M-7-HC	8.5	30,000	75	800	8.5	15	0.3	2	M12x1	0.045
SC190M-5-HC	20	50,000	2	16	12	25	0.4	2	M14x1.5	0.059
SC190M-6-HC	20	50,000	13	140	12	25	0.4	2	M14x1.5	0.059
SC190M-7-HC	20	50,000	136	1,540	12	25	0.4	2	M14x1.5	0.059
SC300-5-HC	73	45,000	11	45	12	17	0.2	5	3/4-16 UNF / M20x1.5	0.164
SC300-6-HC	73	45,000	34	136	12	17	0.2	5	3/4-16 UNF / M20x1.5	0.164
SC300-7-HC	73	45,000	91	181	12	17	0.2	5	3/4-16 UNF / M20x1.5	0.164
SC300-8-HC	73	45,000	135	680	12	17	0.2	5	3/4-16 UNF / M20x1.5	0.164
SC300-9-HC	73	45,000	318	885	12	17	0.2	5	3/4-16 UNF / M20x1.5	0.164
SC650-5-HC	136	68,000	23	113	22	37	0.3	5	1-12 UNF / M25x1.5	0.315
SC650-6-HC	136	68,000	91	363	22	37	0.3	5	1-12 UNF / M25x1.5	0.315
SC650-7-HC	136	68,000	318	1,090	22	37	0.3	5	1-12 UNF / M25x1.5	0.315
SC650-8-HC	136	68,000	770	2,630	22	37	0.3	5	1-12 UNF / M25x1.5	0.315
SC650-9-HC	136	68,000	1,800	6,350	22	37	0.3	5	1-12 UNF / M25x1.5	0.315

¹ For applications with higher side load angles consider using the side load adaptor, pages 44 to 49.

MA30 to MA900

Stepless adjustment

Adjustable

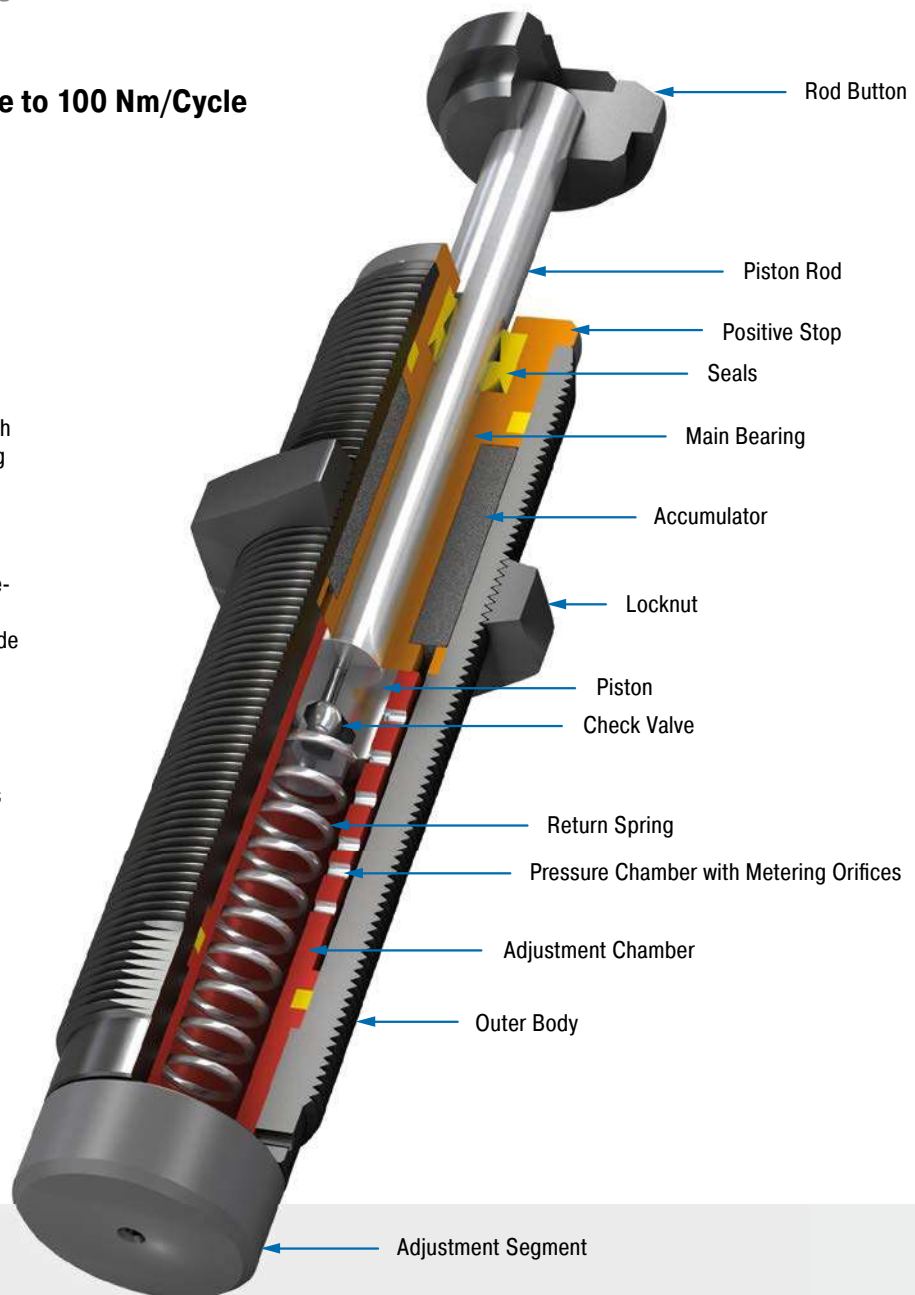
Energy capacity 3.5 Nm/Cycle to 100 Nm/Cycle

Stroke 8 mm to 40 mm

The miniature shock absorbers from the MA30 to MA900 product family can be adjusted and precisely adapted to your requirements. For example, the MA150 displays the rolling diaphragm technology from the MC150 to MC600 family and offers all of the advantages of this technology, such as use in pressure chambers. Thanks to long strokes (including 40 mm on the MA900) lower reaction forces result, which provide a soft damping characteristic.

All variations of these units are maintenance-free, ready-to-install machine elements and have an integrated positive stop. They provide the best service where application data changes, where the calculation parameters are not clear or where maximum flexibility in the possible usage is required.

These adjustable miniature shock absorbers from ACE can be used to precisely meet the customer's application needs and are therefore found everywhere in industrial, automation and machine engineering and many other applications.



Technical Data

Energy capacity: 3.5 Nm/Cycle to 100 Nm/Cycle

Impact velocity range: 0.15 m/s to 4.5 m/s. Other speeds on request.

Operating temperature range: 0 °C to 66 °C

Mounting: In any position

Positive stop: Integrated

Adjustment: Hard impact at the start of stroke, adjust the ring towards 9 or PLUS. Hard impact at the end of stroke, adjust the ring towards 0 or MINUS.

Material: Outer body, Accessories: Steel corrosion-resistant coating; Piston rod: Hardened stainless steel

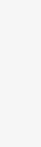
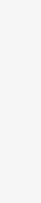
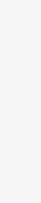
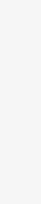
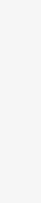
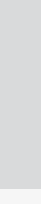
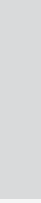
Damping medium: Oil, temperature stable

Application field: Linear slides, Pneumatic cylinders, Swivel units, Handling modules, Machines and plants, Finishing and processing centers, Automatic machinery, Tool machines, Locking systems

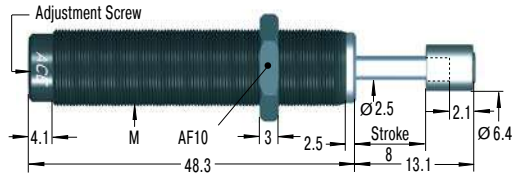
Note: If precise end position data is required consider use of a stop collar. Shock absorber is preset at delivery in a neutral position between hard and soft.

Safety information: External materials in the surrounding area can attack the seal components and lead to a shorter service life. Please contact ACE for appropriate solution suggestions. Do not paint the shock absorbers due to heat emission.

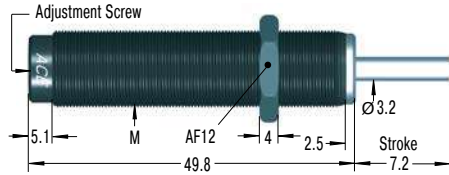
On request: Nickel-plated or other special options available to special order. Models without rod end button.



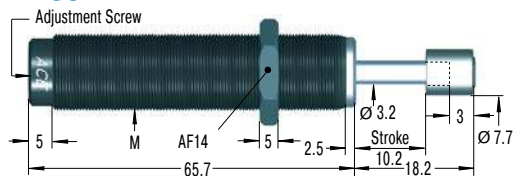
MA30M



MA50M

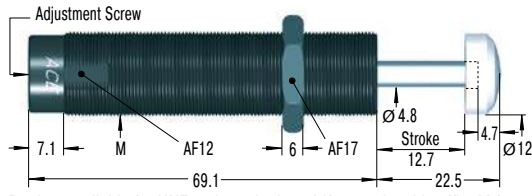


MA35



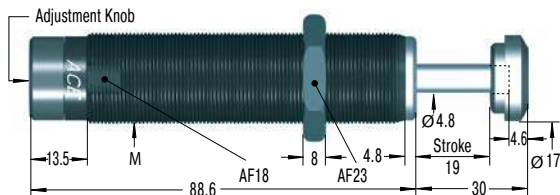
Product available for UNF and metric thread (for metric add suffix -M from part number)

MA150



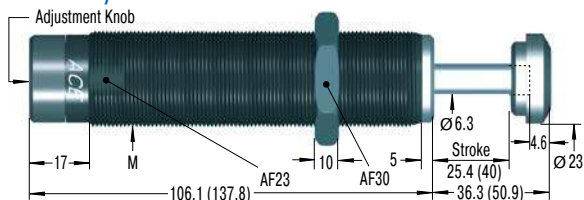
Product available for UNF and metric thread (for metric add suffix -M from part number)
M14x1 also available to special order

MA225



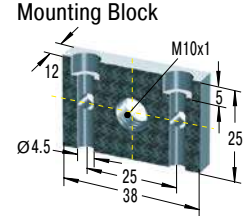
Product available for UNF and metric thread (for metric add suffix -M from part number)

MA600 / MA900

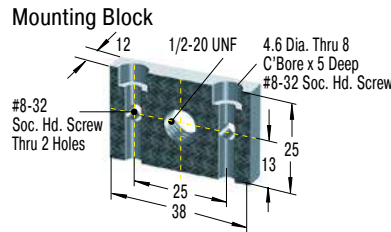


Product available for UNF and metric thread (for metric add suffix -M from part number)
Dimensions for MA900M in ().

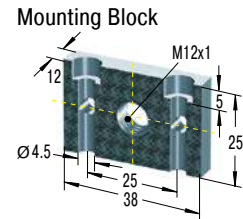
250-0307



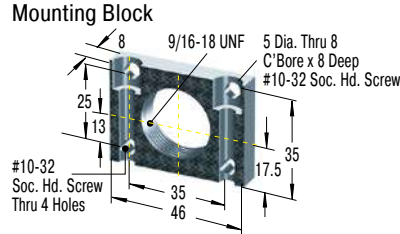
250-0308



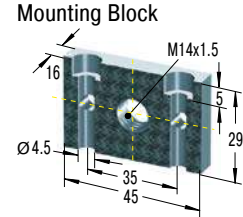
250-0309



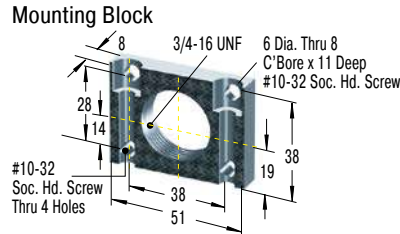
250-0318



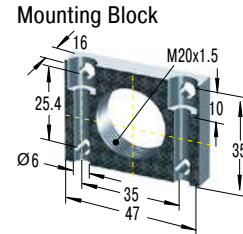
250-0352



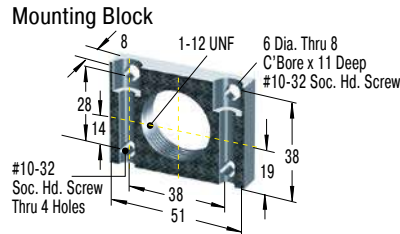
250-0401



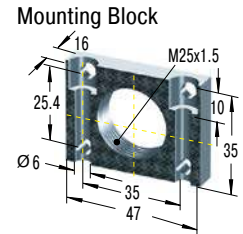
250-0353



250-0402



250-0044



Additional accessories, mounting, installation ... starting on page 40.

Performance

TYPES	Max. Energy Capacity		Effective Weight		Return Force min. N	Return Force max. N	Return Time s	1 Side Load Angle max. °	M	Weight kg
	E ₃ Nm/cycle	E ₄ Nm/h	We min. kg	We max. kg						
MA30M	3.5	5,650	0.23	15	1.7	5.3	0.3	2	M8x1	0.013
MA50M	5.5	13,550	4.5	20	3	6	0.3	2	M10x1	0.025
MA35	4	6,000	6	57	5	11	0.2	2	1/2-20 UNF / M12x1	0.043
MA150	22	35,000	1	109	3	5	0.4	2	9/16-18 UNF / M14x1.5	0.061
MA225	25	45,000	2.30	226	5	10	0.4	2	3/4-16 UNF / M20x1.5	0.173
MA600	68	68,000	9	1,360	10	30	0.2	2	1-12 UNF / M25x1.5	0.352
MA900	100	90,000	14	2,040	10	35	0.4	1	1-12 UNF / M25x1.5	0.414

1 For applications with higher side load angles consider using the side load adaptor, pages 44 to 49.

3/8x1

Miniature adjustable shock delivers convenience

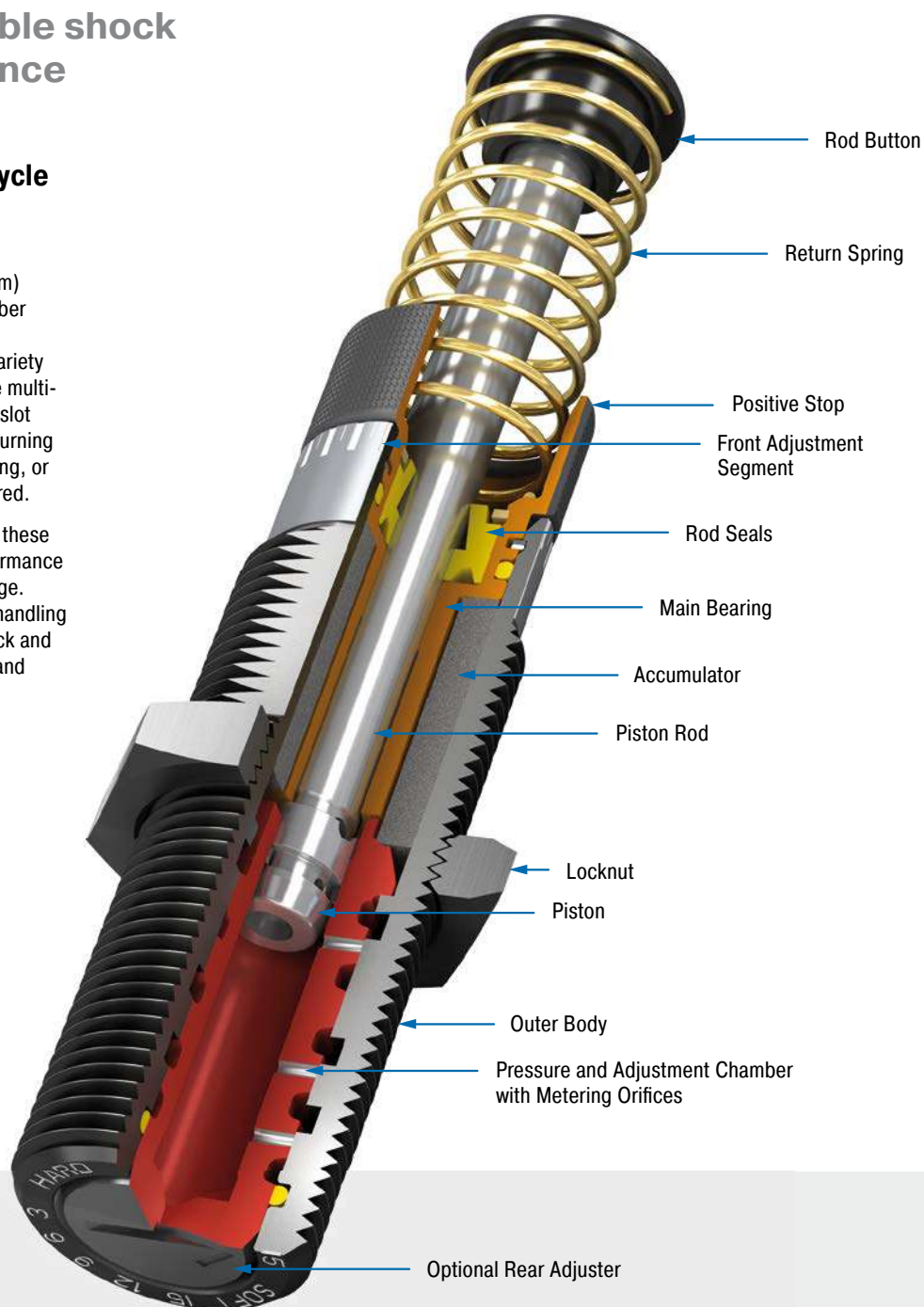
Adjustable

Energy capacity 68 Nm/Cycle

Stroke 25 mm

ACE Controls 3/8x1" (9.53 mm x 25 mm) bore adjustable miniature shock absorber offers high energy capacity and a wide effective weight range for handling a variety of applications. A unique feature of the multi-orifice 3/8x1" bore is the optional rear slot adjuster. Adjustment can be made by turning the front adjuster to the preferred setting, or by turning the rear slot adjuster if desired.

Available with side or rear adjustment, these 1" bore shock absorbers provide performance and convenience in one reliable package. Applications include: Slides, material handling equipment, robotics, machine tools, pick and place systems, packaging equipment and more.



Technical Data

Energy capacity: 68 Nm/Cycle

Impact velocity range: 0.5 m/s to 4.6 m/s

Operating temperature range: -12 °C to 66 °C

Mounting: In any position. Clevis mounting available (NA 3/8x1)

Adjustment: Adjustment can be made by turning the front adjuster to the preferred setting, or by turning the rear slot adjuster if desired.

Material: Outer body, Accessories: Steel corrosion-resistant coating; Main bearing, Rod end button: Steel hardened; Piston rod: Steel hardened and chrome plated; Return spring: Steel; Locknut: Zinc plated steel

Damping medium: American 46

Application field: Linear slides, Transport industry, Tool machines, Handling modules, Production plants

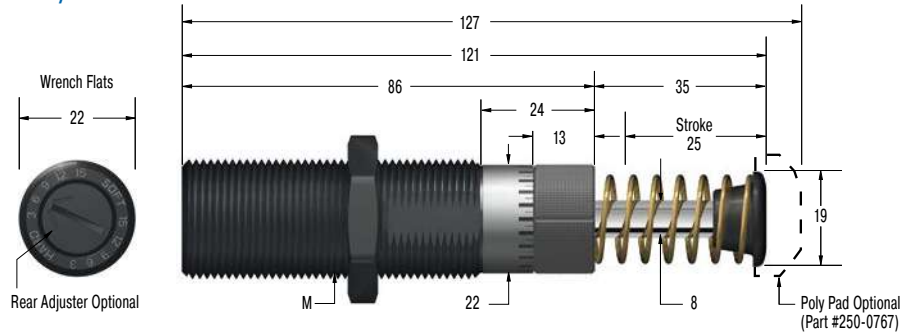
Note: Maximum side load depends on application. For additional information contact ACE Controls' Applications Department. Lock nut included with each shock absorber.

Safety information: External materials in the surrounding area can attack the seal components and lead to a shorter service life. Please contact ACE for appropriate solution suggestions. Do not paint the shock absorbers due to heat emission.

On request: Increased corrosion protection. Special finishes. Models without rod end button also available on request.

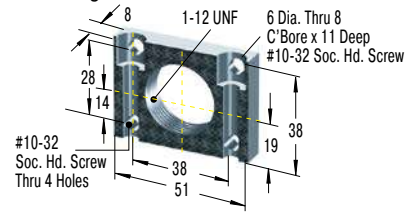
Adjustable

AS3/8x1

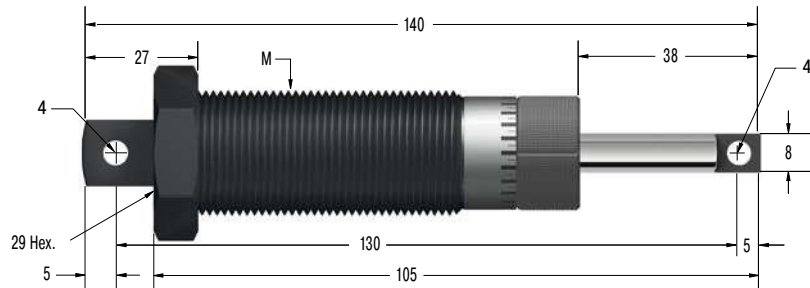


250-0402

Mounting Block

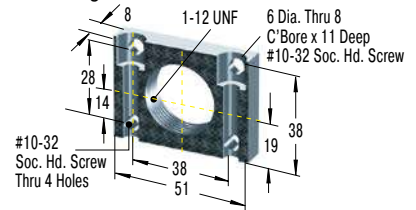


NA3/8x1



250-0402

Mounting Block



Additional accessories, mounting, installation ... starting on page 40.

Performance

TYPES	Max. Energy Capacity		Effective Weight		Return Force min. N	Return Force max. N	Return Time s	Side Load Angle max. °	M	Weight kg
	E ₃ Nm/cycle	Energy capacity Nm/h	We min. kg	We max. kg						
AS3/8x1	68	68,000	4.54	567	27	49	0.03	5	1-12 UNF	0.198
NA3/8x1	68	68,000	4.54	577	30	49	0.13	5	N/A	0.198

¹ For applications with higher side load angles consider using the side load adaptor, pages 44 to 49.

Selection Chart



Shock Absorber Type	¹ Locknut	² Stop Collar	Mounting Block	³ Side Load Adaptor
Thread M5x0.5				
MC5M	0801-001	-	-	-
Thread M6x0.5				
MC9M	250-0716	-	-	-
Thread M8x1				
MA30M	250-0482	-	-	250-0146
MC10M	250-0482	-	-	250-0141
MC30M	250-0482	-	-	250-0146
Thread M10x1				
MA50M	250-0315	250-0408	250-0307	250-0562
MC25M	250-0315	250-0408	250-0307	250-0562
SC25M; 5 to 7	250-0315	250-0408	250-0307	-
SC25M-HC	250-0315	250-0408	250-0307	-
Thread M12x1				
MA35M	250-0317	250-0409	250-0309	250-0760
MC75M	250-0317	250-0409	250-0309	250-0760
SC75M; 5 to 7	250-0317	250-0409	250-0309	250-0145
SC75M-HC	250-0317	250-0409	250-0309	-
Thread M14x1.5				
MA150M	250-0233	250-0272	250-0352	250-0558
MC150M	250-0233	250-0272	250-0352	250-0558
MC150M-V4A	250-0441	250-0243	250-0255	-
PMCN150M	250-0233	-	250-0352	-
PMCN150M-V4A	250-0441	-	250-0255	-
SC190M; 0 to 4	250-0233	250-0272	250-0352	250-0080
SC190M; 5 to 7	250-0233	250-0272	250-0352	250-0558
SC190M-HC	250-0233	250-0272	250-0352	-
Thread M20x1.5				
MA225M	250-0207	250-0410	250-0353	250-0081
MC225M	250-0207	250-0410	250-0353	250-0559
MC225M-V4A	250-0442	250-0253	250-0434	-
PMCN225M	250-0207	-	250-0353	-
PMCN225M-V4A	250-0442	-	250-0434	-
SC300M; 0 to 4	250-0207	250-0410	250-0353	250-0081
SC300M; 5 to 9	250-0207	250-0410	250-0353	-
SC300M-HC	250-0207	250-0410	250-0353	-
Thread M25x1.5				
AS3/8x1M	250-0040	250-0766	250-0044	-
MA600M	250-0040	250-0276	250-0044	250-0082
MA900M	250-0040	250-0276	250-0044	250-0082
MC600M	250-0040	250-0276	250-0044	250-0560
MC600M-V4A	250-0443	250-0254	250-0436	-
PMCN600M	250-0040	-	250-0044	-
PMCN600M-V4A	250-0443	-	250-0436	-
SC650M; 0 to 4	250-0040	250-0276	250-0044	250-0082
SC650M; 5 to 9	250-0040	250-0276	250-0044	-
SC650M-HC	250-0040	250-0276	250-0044	-
SC925M; 0 to 4	250-0040	250-0276	250-0044	-

¹ Additional special options: Locknut 250-0362 for the MC10ME (extra fine thread), locknut 250-0232 for the MA/MC150E (extra fine thread), locknut 250-0239 for the MC600ML (extra fine thread).

² Additional special options: Stop Collar 250-0263 for the MC600ML (extra fine thread).

³ Only mountable on units without button. Remove the button from the shock absorber, if there's one fitted!

The following side load adaptors fit -880 model shock absorbers: 250-0080, -0081, -0082, -0141, -0145, -0562, -0760, -0762 and -0763.

Dimensions can be found on the corresponding accessories pages.


Steel Shroud
Steel Button
Steel/Urethane Button
Nylon Button
Page

Thread	Steel Shroud	Steel Button	Steel/Urethane Button	Nylon Button	Page
Thread M5x0.5	-	-	-	-	44
Thread M6x0.5	-	-	-	-	44
Thread M8x1	250-0832	-	250-0764	-	44
	250-0833	-	-	-	44
	250-0832	-	250-0764	-	44
Thread M10x1	250-0834	250-0124	-	-	44
	250-0834	250-0124	250-0094	-	44
	250-0835	250-0175	-	-	44
	250-0835	250-0175	-	-	44
Thread M12x1	250-0836	250-0786	250-0094	-	45
	250-0836	250-0786	250-0094	-	45
	250-0837	250-0174	-	-	45
	250-0837	250-0174	-	-	45
Thread M14x1.5	250-0733	250-0111	250-0095	-	45
	250-0733	250-0111	250-0095	250-0753	45
	-	-	-	250-0753	45
	-	-	-	-	45
	-	-	-	-	45
	250-0785	included	250-0096	-	45
	250-0733	250-0111	250-0095	-	45
	250-0733	250-0111	250-0095	-	45
Thread M20x1.5	250-0734	included	250-0098	-	46
	250-0170	250-0112	250-0097	250-0754	46
	-	-	-	250-0754	46
	-	-	-	-	46
	-	-	-	-	46
	250-0734	included	250-0098	-	46
	250-0734	included	250-0105	-	46
	250-0734	included	250-0105	-	46
Thread M25x1.5	-	-	250-0099	-	47
	250-0765	included	250-0100	-	47
	250-0765	included	250-0100	-	47
	250-0171	10721-000	250-0099	250-0755	47
	-	-	-	250-0755	47
	-	-	-	-	47
	-	-	-	-	47
	250-0765	included	250-0100	-	47
	250-0171	included	250-0099	-	47
	250-0171	included	250-0099	-	47
	-	included	250-0100	-	47

Selection Chart



Shock Absorber Type	Locknut	Stop Collar	Mounting Block	¹ Side Load Adaptor
Thread 3/8-32 UNF				
MC25	250-0404	250-0406	250-0306	–
Thread 1/2-20 UNF				
MA35	250-0405	250-0407	250-0308	–
MC75	250-0405	250-0407	250-0308	250-0762
Thread 9/16-18 UNF				
MA150	250-0231	250-0271	250-0318	250-0554
MC150	250-0231	250-0271	250-0318	250-0554
SC190; 0 to 4	250-0231	250-0271	250-0318	–
Thread 3/4-16 UNF				
MA225	250-0399	250-0403	250-0401	250-0561
MC225	250-0399	250-0403	250-0401	250-0561
SC300; 0 to 4	250-0399	250-0403	250-0401	–
SC300; 5 to 9	250-0399	250-0403	250-0401	–
SC300-HC	250-0399	250-0403	250-0401	–
Thread 1-12 UNF				
AS3/8x1	250-0400	250-0774	250-0402	–
MA600	250-0400	250-0275	250-0402	–
MA900	250-0400	250-0275	250-0402	–
MC600	250-0400	250-0275	250-0402	250-0763
NA3/8x1	250-0400	250-0774	250-0402	–
SC650; 0 to 4	250-0400	250-0275	250-0402	–
SC650; 5 to 9	250-0400	250-0275	250-0402	–
SC650-HC	0801-041	250-0275	250-0402	–
SC925; 0 to 4	250-0400	250-0275	250-0402	–

¹ Only mountable on units without button. Remove the button from the shock absorber, if there's one fitted!

The following side load adaptors fit -880 model shock absorbers: 250 -0080, -0081, -0082, -0141, -0145, -0562, -0760, -0762 and -0763.

Dimensions can be found on the corresponding accessories pages.



Steel Shroud

Steel Button

Steel/Urethane Button

Nylon Button

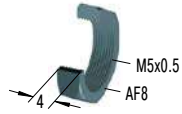
Page

Thread	Steel Shroud	Steel Button	Steel/Urethane Button	Nylon Button	Page
Thread 3/8-32 UNF	250-0834	250-0124	250-0094	-	48
Thread 1/2-20 UNF	-	250-0786	250-0094	-	48
	250-0836	250-0786	250-0094	-	48
Thread 9/16-18 UNF	250-0733	250-0111	250-0095	-	48
	250-0785	250-0111	250-0095	250-0753	48
	250-0733	included	250-0096	-	48
Thread 3/4-16 UNF	250-0734	included	250-0098	-	49
	250-0170	250-0112	250-0097	250-0754	49
	250-0734	included	250-0098	-	49
	250-0734	included	250-0105	-	49
	250-0734	included	250-0105	-	49
Thread 1-12 UNF	-	included	250-0099	-	49
	250-0765	included	250-0100	-	49
	-	included	250-0100	-	49
	250-0171	10721-000	250-0099	250-0755	49
	-	included	250-0099	-	49
	250-0765	included	250-0100	-	49
	250-0171	included	250-0099	-	49
	250-0171	included	250-0099	-	49
	-	included	250-0100	-	49

Selection Chart See Pages 40 to 41

M5x0.5

0801-001
Locknut



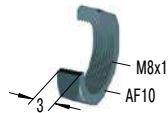
M6x0.5

250-0716
Locknut

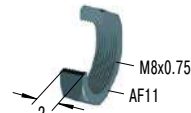


M8x1

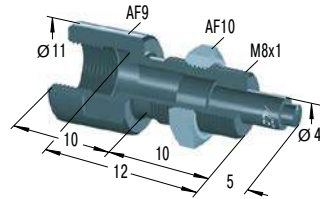
250-0482
Locknut



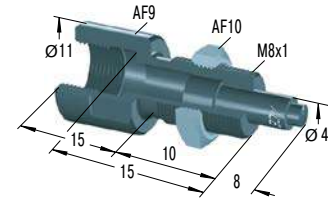
250-0362
Locknut



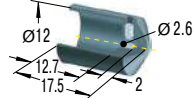
250-0141
Side Load Adaptor



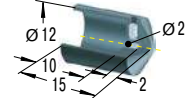
250-0146
Side Load Adaptor



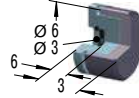
250-0832
Steel Shroud



250-0833
Steel Shroud

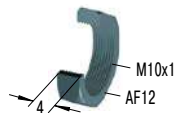


250-0764
Steel/Urethane Button

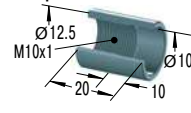


M10x1

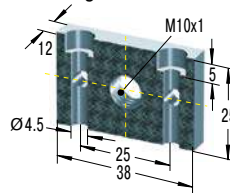
250-0315
Locknut



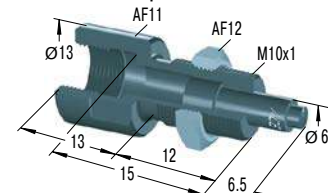
250-0408
Stop Collar



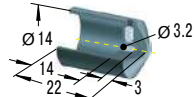
250-0307
Mounting Block



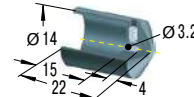
250-0562
Side Load Adaptor



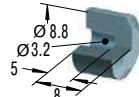
250-0834
Steel Shroud



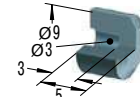
250-0835
Steel Shroud



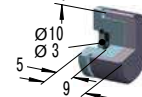
250-0124
Steel Button



250-0175
Steel Button



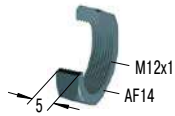
250-0094
Steel/Urethane Button



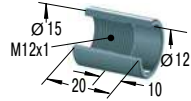
Mounting, installation, ... see pages 50 to 51.

M12x1

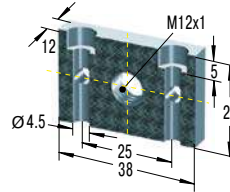
250-0317
Locknut



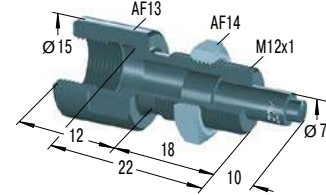
250-0409
Stop Collar



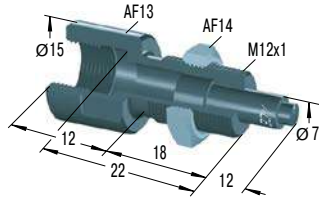
250-0309
Mounting Block



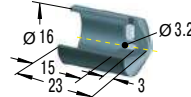
250-0145
Side Load Adaptor



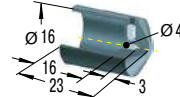
250-0760
Side Load Adaptor



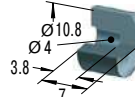
250-0836
Steel Shroud



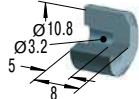
250-0837
Steel Shroud



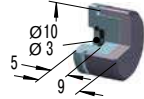
250-0174
Steel Button



250-0786
Steel Button

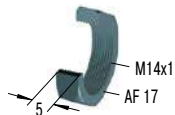


250-0094
Steel/Urethane Button



M14x1

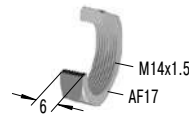
250-0232
Locknut



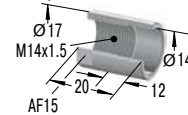
250-0233
Locknut



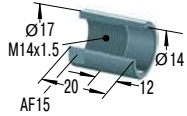
250-0441
Locknut



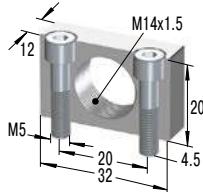
250-0243
Stop Collar



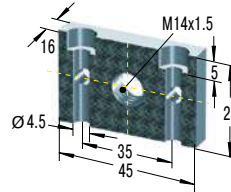
250-0272
Stop Collar



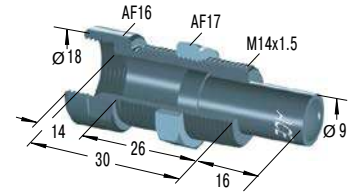
250-0255
Mounting Block



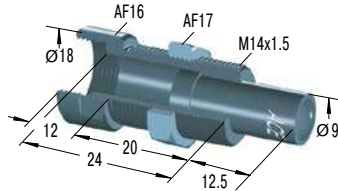
250-0352
Mounting Block



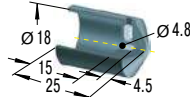
250-0080
Side Load Adaptor



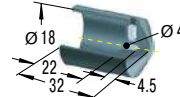
250-0558
Side Load Adaptor



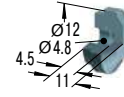
250-0733
Steel Shroud



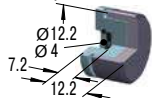
250-0785
Steel Shroud



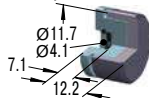
250-0111
Steel Button



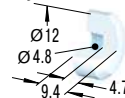
250-0095
Steel/Urethane Button



250-0096
Steel/Urethane Button



250-0753
Nylon Button



E_s max = 14 Nm

Selection Chart See Pages 40 to 41

M20x1.5

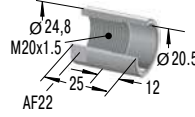
250-0207
Locknut



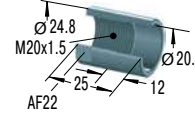
250-0442
Locknut



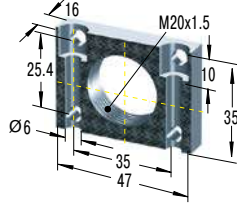
250-0253
Stop Collar



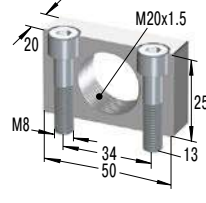
250-0410
Stop Collar



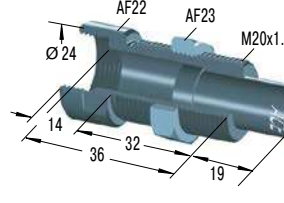
250-0353
Mounting Block



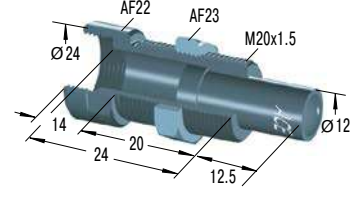
250-0434
Mounting Block



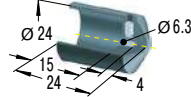
250-0081
Side Load Adaptor



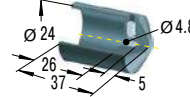
250-0559
Side Load Adaptor



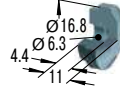
250-0170
Steel Shroud



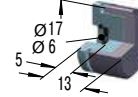
250-0734
Steel Shroud



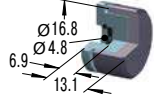
250-0112
Steel Button



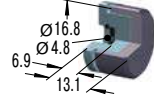
250-0097
Steel/Urethane Button



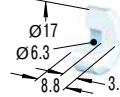
250-0098
Steel/Urethane Button



250-0105
Steel/Urethane Button



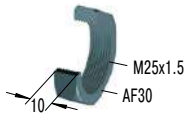
250-0754
Nylon Button



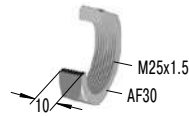
$E_3 \text{ max} = 33 \text{ Nm}$

M25x1.5

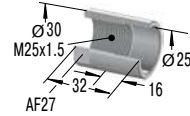
250-0040
Locknut



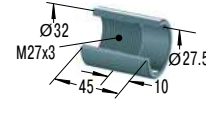
250-0443
Locknut



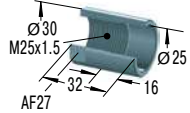
250-0254
Stop Collar



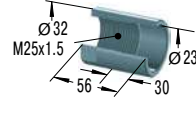
250-0263
Stop Collar



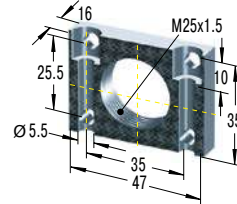
250-0276
Stop Collar



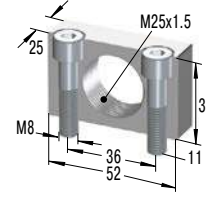
250-0766
Stop Collar



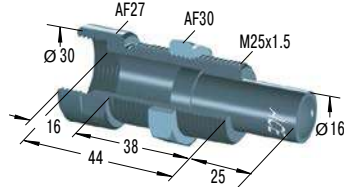
250-0044
Mounting Block



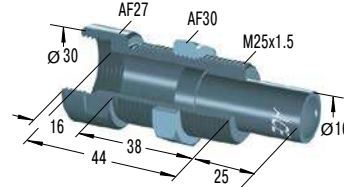
250-0436
Mounting Block



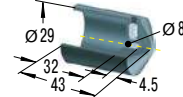
250-0082
Side Load Adaptor



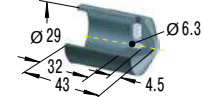
250-0560
Side Load Adaptor



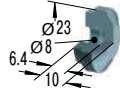
250-0171
Steel Shroud



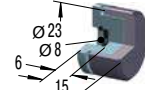
250-0765
Steel Shroud



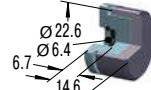
10721-000
Steel Button



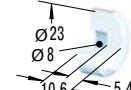
250-0099
Steel/Urethane Button



250-0100
Steel/Urethane Button



250-0755
Nylon Button



$E_s \text{ max} = 68 \text{ Nm}$

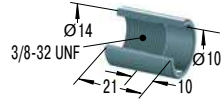
Selection Chart See Pages 42 to 43

3/8-32 UNF

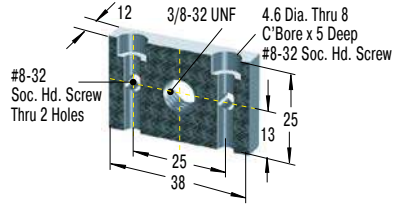
250-0404
Locknut



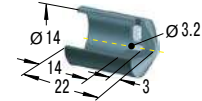
250-0406
Stop Collar



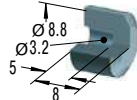
250-0306
Mounting Block



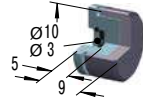
250-0834
Steel Shroud



250-0124
Steel Button



250-0094
Steel/Urethane Button

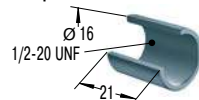


1/2-20 UNF

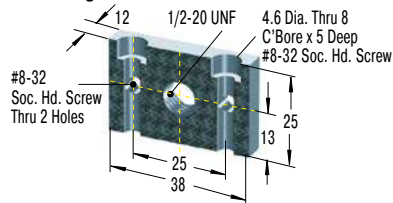
250-0405
Locknut



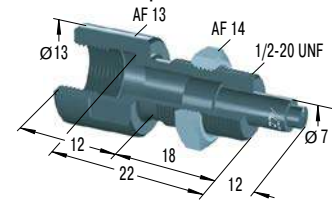
250-0407
Stop Collar



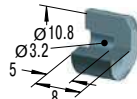
250-0308
Mounting Block



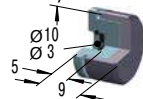
250-0762
Side Load Adaptor



250-0786
Steel Button



250-0094
Steel/Urethane Button

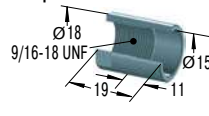


9/16-18 UNF

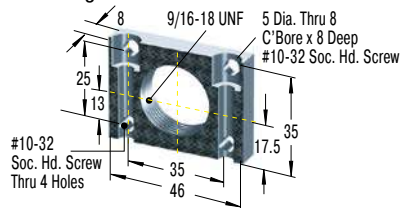
250-0231
Locknut



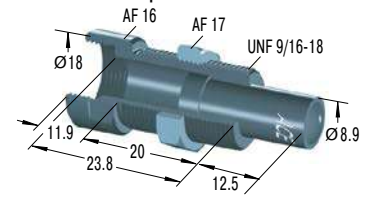
250-0271
Stop Collar



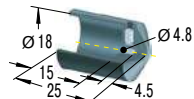
250-0318
Mounting Block



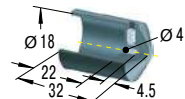
250-0554
Side Load Adaptor



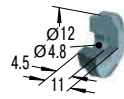
250-0733
Steel Shroud



250-0785
Steel Shroud



250-0111
Steel Button



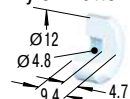
250-0095
Steel/Urethane Button



250-0096
Steel/Urethane Button



250-0753
Nylon Button



$E_{s,max} = 14 \text{ Nm}$

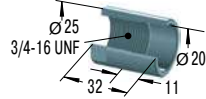
Mounting, installation, ... see pages 50 to 51.

3/4-16 UNF

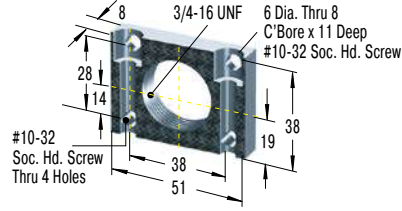
250-0399
Locknut



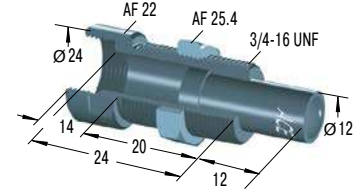
250-0403
Stop Collar



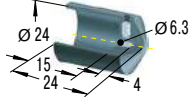
250-0401
Mounting Block



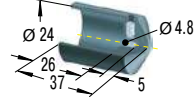
250-0561
Side Load Adaptor



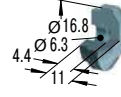
250-0170
Steel Shroud



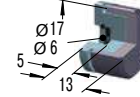
250-0734
Steel Shroud



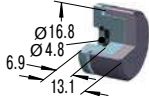
250-0112
Steel Button



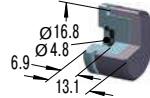
250-0097
Steel/Urethane Button



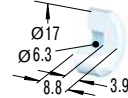
250-0098
Steel/Urethane Button



250-0105
Steel/Urethane Button



250-0754
Nylon Button



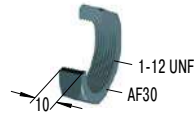
$E_3 \text{ max} = 33 \text{ Nm}$

1-12 UNF

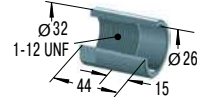
0801-041
Locknut



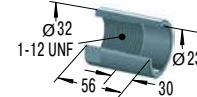
250-0400
Locknut



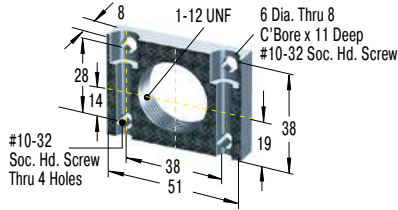
250-0275
Stop Collar



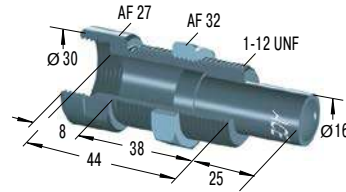
250-0774
Stop Collar



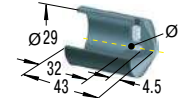
250-0402
Mounting Block



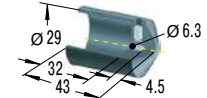
250-0763
Side Load Adaptor



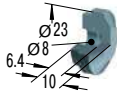
250-0171
Steel Shroud



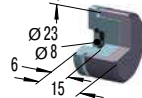
250-0765
Steel Shroud



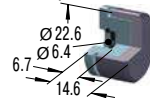
10721-000
Steel Button



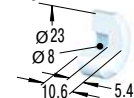
250-0099
Steel/Urethane Button



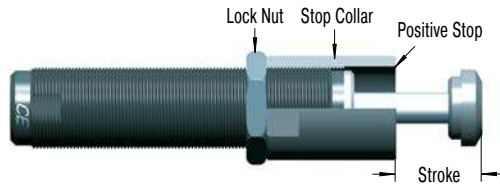
250-0100
Steel/Urethane Button



250-0755
Nylon Button



$E_3 \text{ max} = 68 \text{ Nm}$



Stop Collar

All ACE miniature shock absorbers have an integrated positive stop. An optional stop collar can be added if desired to give fine adjustment of final stopping position.



Mounting Block

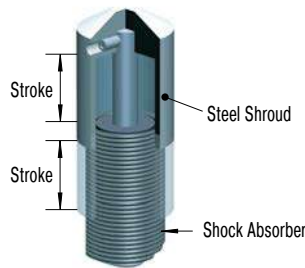
This versatile block can be mounted to a horizontal or vertical surface. The shock is screwed into the center threaded hole and secured with a locknut.

Mounting information

Mounting block only. Bolts supplied separately.

Delivery

One locknut is included with each shock.



Steel Shroud

Grinding beads, sand, welding splatter, paints, adhesives, etc. can adhere to the piston rod. They then damage the rod seals and the shock absorber quickly fails. In many cases the installation of the optional steel shroud can provide worthwhile protection and increase lifetime.

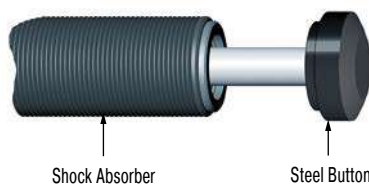
Ordering information

The steel shroud can only be installed onto a shock absorber without rod end button.

For part number MA, MC, SC please order with "-880" suffix. Part numbers MA150, MC150 to MC600 and SC25 to SC190 5-7 are supplied without a button.

Safety information

When installing don't forget to allow operating space for the shroud to move as the shock absorber is cycled.

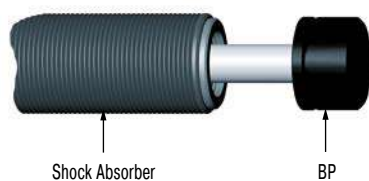


Steel Button

The buttons are made of an oxidized steel, and offer durability beyond nylon or urethane options. They fit easily onto the piston rod of the corresponding shock absorber. Steel buttons are included on most MA and SC models. Options are available all other models that do not include the standard steel button.

Mounting information

Depending on the model, these buttons may be additionally secured with an O-Ring and LOCTITE.



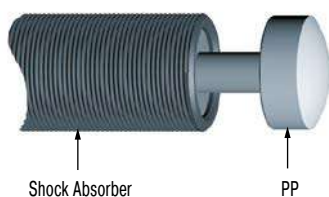
Steel/Urethane Button

These impact buttons made of urethane offer all advantages of the nylon button in terms of reducing noise and wear. They fit easily onto the piston rod of the corresponding shock absorber. The impact buttons must additionally be secured with LOCTITE.

Ordering information

New orders can include this button already installed by adding -BP to the part number.

Please refer to the accessories table on pages 40 to 43 to see which shock absorber types the steel urethane buttons are available for.

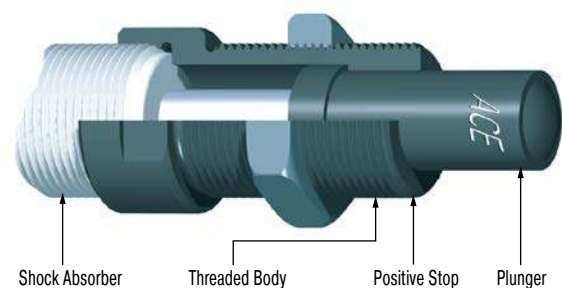


Nylon Button

While the use of industrial shock absorbers provides a considerable reduction in noise levels, adding impact buttons made of glass fiber reinforced nylon reduces noise levels even further. Additionally, use of a nylon button drastically reduces wear to the impact surface. These nylon buttons are available for the MA150 and the MC150 to MC600 shock absorber series.

Mounting information

The buttons are fitted by pressing onto the piston rod. We recommend to additionally fix the nylon button with LOCTITE.



Side Load Adaptor

Rotating impact motion causes high side load forces on the piston rod. This increases bearing wear and possibly results in rod breakage or bending. With side load impact angles of more than 3° the operation lifetime of the shock absorber reduces rapidly due to increased wear of the rod bearings. The optional side load adaptor provides long lasting solution.

Ordering information

The side load adaptor can only be installed onto a shock absorber without rod end button.

Material

Threaded body and plunger: Hardened high tensile steel, hardened 610 HV1

Mounting information

Secure the side load adaptor with LOCTITE or locknut on the shock absorber. For material combination plunger/impact plate use similar hardness values. We recommend that you install the shock absorber/ side load adaptor using the thread on the side load adaptor.

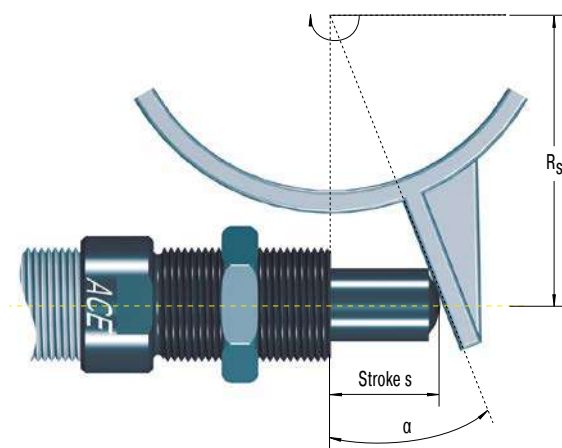
Safety information

Maximum angle:

250-0141, 250-0145, 250-0146, 250-0562, 250-0762 = 12.5°

250-0554, 250-0561, 250-0763 = 25°

By repositioning the centre of the stroke of the side load plunger to be at 90 degrees to the piston rod, the side load angle can be halved. The use of an external positive stop due to high forces encountered is required.



Formulae:

$$\alpha = \tan^{-1} \left(\frac{s}{R_s} \right) \quad R_{s \min} = \frac{s}{\tan \alpha \max}$$

Example:

$$s = 0.025 \text{ m} \quad \alpha \max = 25^\circ \text{ (adapter 250-0763)}$$

$$R_s = 0.1 \text{ m}$$

$$\alpha = \tan^{-1} \left(\frac{0.025}{0.1} \right) \quad R_{s \min} = \frac{0.025}{\tan 25}$$

$$\alpha = 14.04^\circ \quad R_{s \min} = 0.054 \text{ m}$$

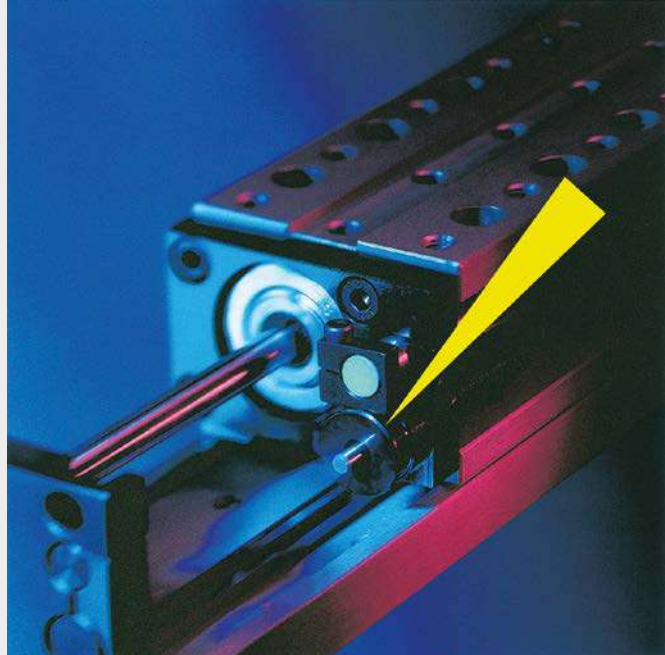
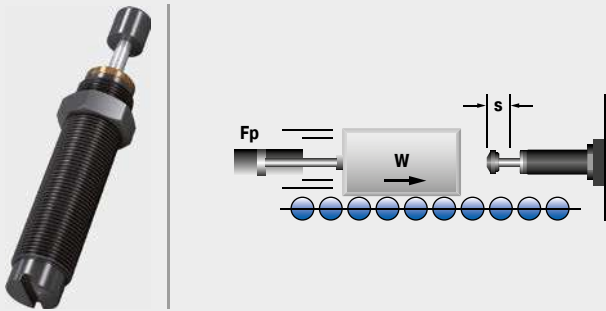
α	= side load angle °	R_s	= mounting radius m
$\alpha \max$	= max. angle °	$R_{s \min}$	= min. possible mounting radius m
s	= absorber stroke m		

Application Examples

MC25

Constant deceleration force

ACE miniature shock absorbers are the right alternative. This pneumatic module for high precision, high speed motion intentionally abandoned pneumatic end-of-travel damping. The compact miniature shock absorbers of the type MC25H-NB decelerate the linear motion safer and faster when reaching the end-of-travel position. They accept the moving load gently and decelerate it smoothly throughout the entire stroke length. Additional advantages: simpler construction, smaller pneumatic valves, lower maintenance costs as well as reduced compressed air consumption.

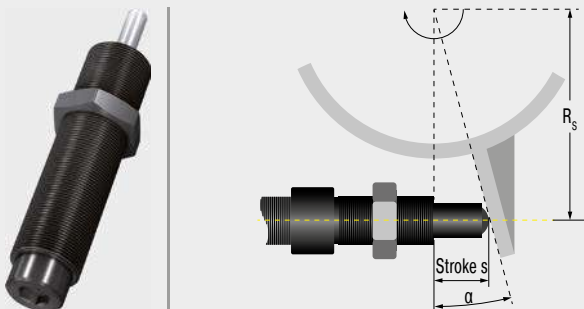


Miniature Shock Absorber in compact pneumatic module

MC225

Obstacle end positions secured

In the case of driving safety training, swinging flags are used to simulate the sudden appearance of obstacles. If the driver reacts too slowly, the flags are swung just as quickly away to avoid damage to the vehicle. In order to protect the end positions of this safety system during to and fro motion, ACE miniature shock absorbers of the type MC225H2 are installed. They come with a special side load adapter for use in this situation. Among other things, this improves the ability of the shock absorber to absorb lateral forces during to and fro motion.

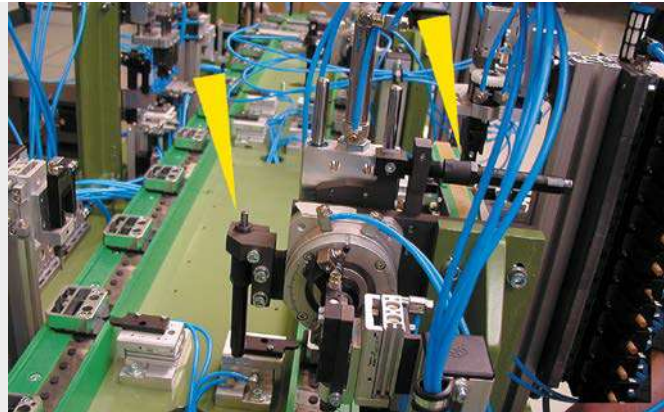


Miniature shock absorbers protect the end positions during driving safety training

Dorninger Hytronics GmbH, 4210 Unterweikersdorf, Austria

SC190
Soft end-of-travel damping on rotary movements

ACE miniature shock absorbers optimize production with minimum expenditure. The cycle rate for an assembly line producing electronic components was increased to 3,600 units/hr. Miniature shock absorbers type SC190-1 decelerate the rapid transfer movements on the production line and using soft damping methods optimize the pick up and set down of components. This soft deceleration technique has increased production and reduced maintenance on the portal and rotary actuator modules. The optional side load adaptor protects the shock absorber from high side load forces and increases the operating lifetime. Using ACE shock absorbers reduces maintenance costs by 50 % and running costs by 20 %, diminishing energy consumption.



Optimised production in the electronics industry
Stebie Maschinenbau GmbH, Germany

