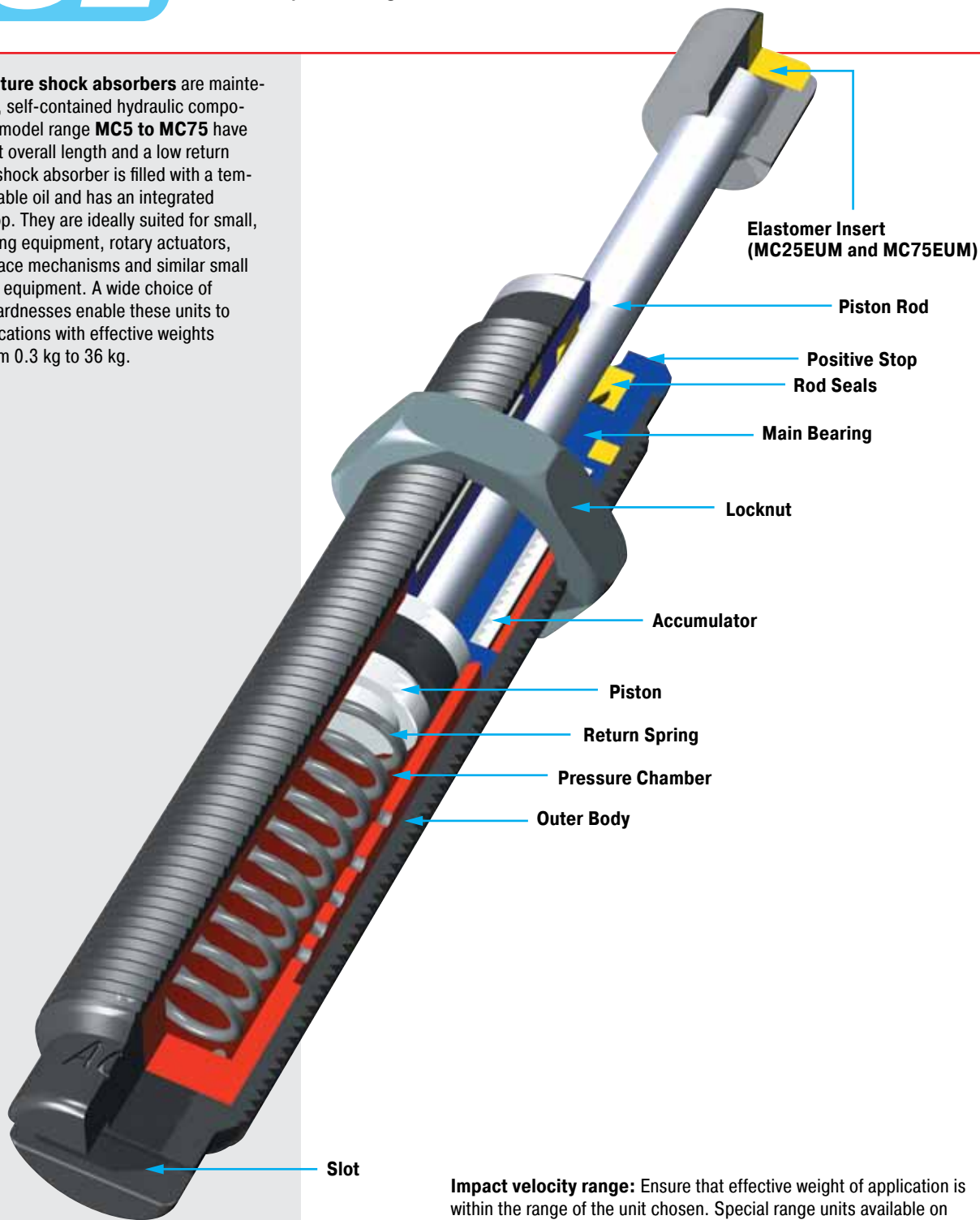


ACE miniature shock absorbers are maintenance-free, self-contained hydraulic components. The model range **MC5 to MC75** have a very short overall length and a low return force. The shock absorber is filled with a temperature stable oil and has an integrated positive stop. They are ideally suited for small, fast, handling equipment, rotary actuators, pick and place mechanisms and similar small automation equipment. A wide choice of metering hardnesses enable these units to cover applications with effective weights ranging from 0.3 kg to 36 kg.



Impact velocity range: Ensure that effective weight of application is within the range of the unit chosen. Special range units available on request.

Material: Shock absorber body: Steel with black oxide finish or nitride hardened. Accessories: Steel with black oxide finish or nitride hardened. Piston rod: Hardened stainless steel. Locknut MC5 and MC9: Aluminium.

W₄ capacity rating: (max. energy per hour Nm/hr) If your application exceeds the tabulated W₄ figures consider additional cooling i.e. cylinder exhaust air etc. Ask ACE for further details.

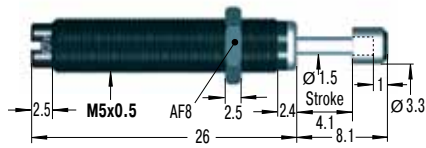
Mounting: In any position. If precise end position datum is required consider use of the optional stop collar type AH.

Operating temperature range: 0 °C to 66 °C

On request: Weartec finish (seawater resistant). Other finishes available to special order.

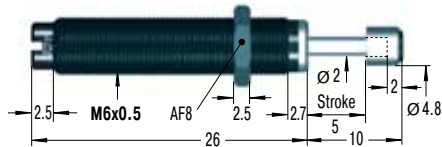


MC5EUM



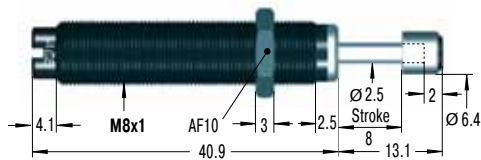
Accessories, mounting, installation ... see pages 36 to 41.

MC9EUM



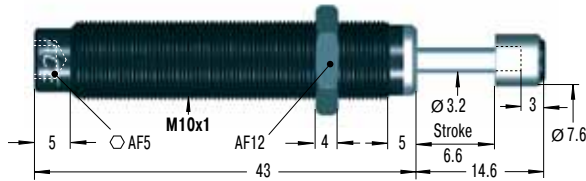
Accessories, mounting, installation ... see pages 36 to 41.

MC30EUM for use on new installations



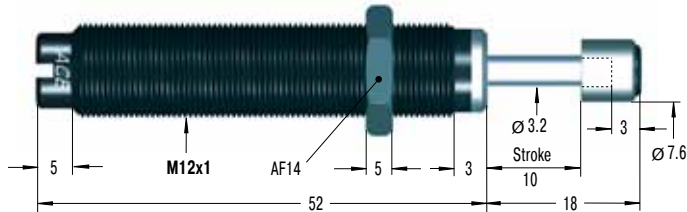
Accessories, mounting, installation ... see pages 36 to 41.

MC25EUM



Accessories, mounting, installation ... see pages 36 to 41.

MC75EUM



Accessories, mounting, installation ... see pages 37 to 41.

Available without rod end button on request.

Capacity Chart

Type Part Number	Max. Energy Capacity		Effective Weight me		Min. Return Force N	Max. Return Force N	Rod Reset Time s	1 Max. Side Load Angle °	Weight kg
	W ₃ Nm/Cycle	W ₄ Nm/h	me min. kg	me max. kg					
MC5EUM-1-B	0.68	2 040	0.5	4.4	1	5	0.2	2	0.003
MC5EUM-2-B	0.68	2 040	3.8	10.8	1	5	0.2	2	0.003
MC5EUM-3-B	0.68	2 040	9.7	18.7	1	5	0.2	2	0.003
MC9EUM-1-B	1	2 000	0.6	3.2	2	4	0.3	2	0.005
MC9EUM-2-B	1	2 000	0.8	4.1	2	4	0.3	2	0.005
MC10EUML-B	1.25	4 000	0.3	2.7	2	4	0.6	3	0.010
MC10EUMH-B	1.25	4 000	0.7	5	2	4	0.6	3	0.010
MC30EUM-1	3.5	5 600	0.4	1.9	2	6	0.3	2	0.010
MC30EUM-2	3.5	5 600	1.8	5.4	2	6	0.3	2	0.010
MC30EUM-3	3.5	5 600	5	15	2	6	0.3	2	0.010
MC25EUML	2.8	22 600	0.7	2.2	3	6	0.3	2	0.020
MC25EUM	2.8	22 600	1.8	5.4	3	6	0.3	2	0.020
MC25EUMH	2.8	22 600	4.6	13.6	3	6	0.3	2	0.020
MC75EUM-1	9	28 200	0.3	1.1	4	9	0.3	2	0.030
MC75EUM-2	9	28 200	0.9	4.8	4	9	0.3	2	0.030
MC75EUM-3	9	28 200	2.7	36.2	4	9	0.3	2	0.030

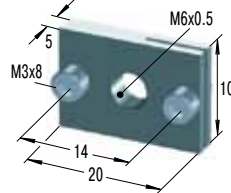
1 For applications with higher side load angles consider using the side load adaptor (BV) pages 36 to 40.

MB5SC2



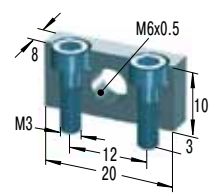
Mounting Block

RF6



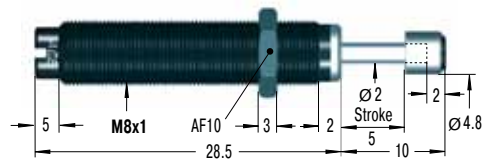
Rectangular Flange

MB6SC2



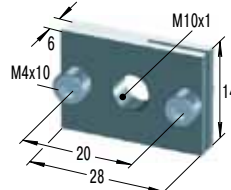
Mounting Block

MC10EUM still available in future



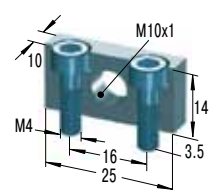
M8x0.75 also available to order

RF10



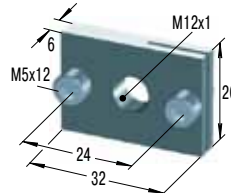
Rectangular Flange

MB10SC2



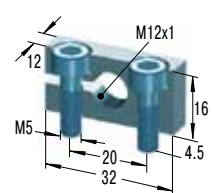
Mounting Block

RF12



Rectangular Flange

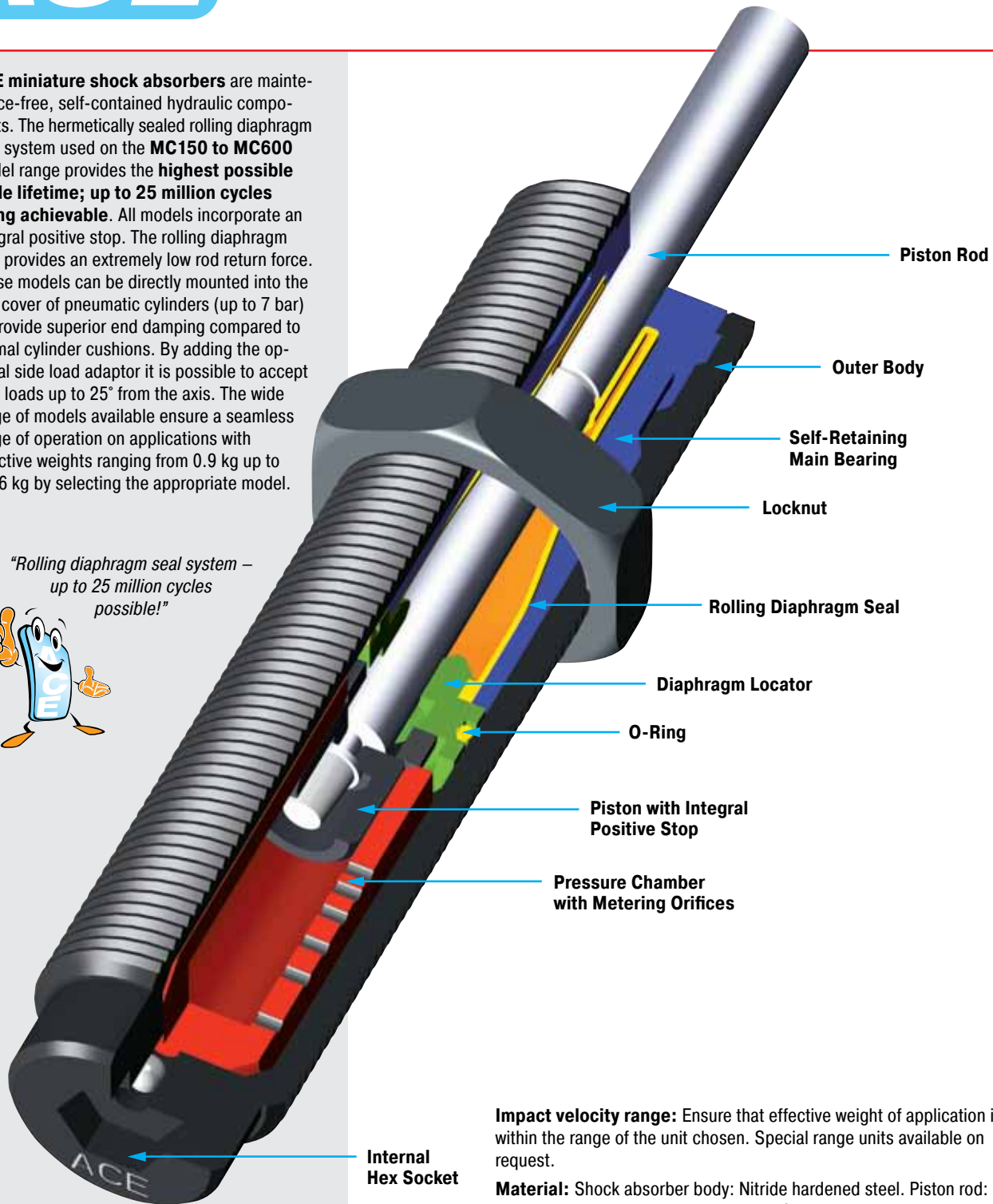
MB12



Clamp Mount

ACE miniature shock absorbers are maintenance-free, self-contained hydraulic components. The hermetically sealed rolling diaphragm seal system used on the **MC150 to MC600** model range provides the **highest possible cycle lifetime; up to 25 million cycles being achievable**. All models incorporate an integral positive stop. The rolling diaphragm seal provides an extremely low rod return force. These models can be directly mounted into the end cover of pneumatic cylinders (up to 7 bar) to provide superior end damping compared to normal cylinder cushions. By adding the optional side load adaptor it is possible to accept side loads up to 25° from the axis. The wide range of models available ensure a seamless range of operation on applications with effective weights ranging from 0.9 kg up to 4536 kg by selecting the appropriate model.

"Rolling diaphragm seal system – up to 25 million cycles possible!"



Impact velocity range: Ensure that effective weight of application is within the range of the unit chosen. Special range units available on request.

Material: Shock absorber body: Nitride hardened steel. Piston rod: Hardened stainless steel. Accessories: Steel with black oxide finish or nitride hardened. Rolling diaphragm seal: EPDM.

Note: Local contamination can effect the rolling seal and reduce the lifetime. Please contact ACE for a suitable solution.

W₄ capacity rating: (max. energy per hour Nm/hr) If your application exceeds the tabulated W₄ figures consider additional cooling i. e. cylinder exhaust air etc. Ask ACE for further details.

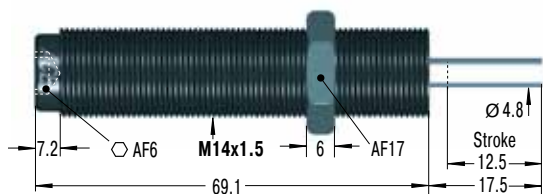
Mounting: In any position. If precise end position datum is required consider use of the optional stop collar type AH.

Operating temperature range: 0 °C to 66 °C

On request: Weartec finish (seawater resistant). Other finishes available to special order.

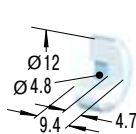


MC150EUM



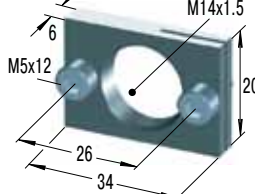
M14x1 also available to special order
Accessories, mounting, installation ... see pages 37 to 41.

PP150



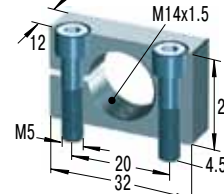
Nylon Button
W₃ max = 14 Nm

RF14



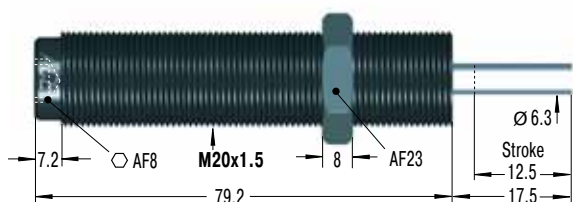
Rectangular Flange

MB14



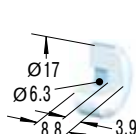
Clamp Mount

MC225EUM



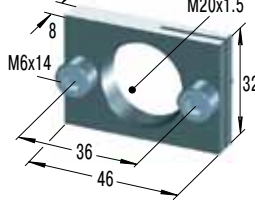
Accessories, mounting, installation ... see pages 38 to 41.

PP225



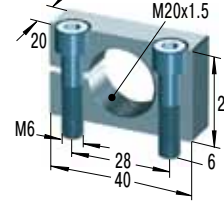
Nylon Button
W₃ max = 33 Nm

RF20



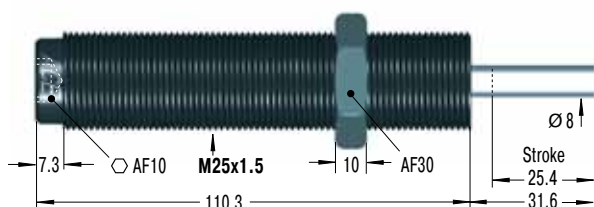
Rectangular Flange

MB20



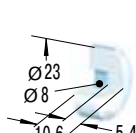
Clamp Mount

MC600EUM



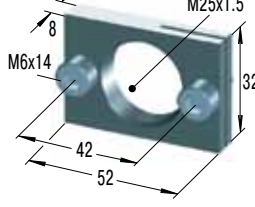
M27x3 also available to special order
Accessories, mounting, installation ... see pages 38 to 41.

PP600



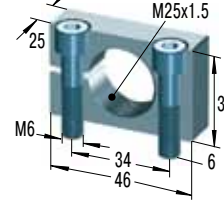
Nylon Button
W₃ max = 68 Nm

RF25



Rectangular Flange

MB25



Clamp Mount

Capacity Chart

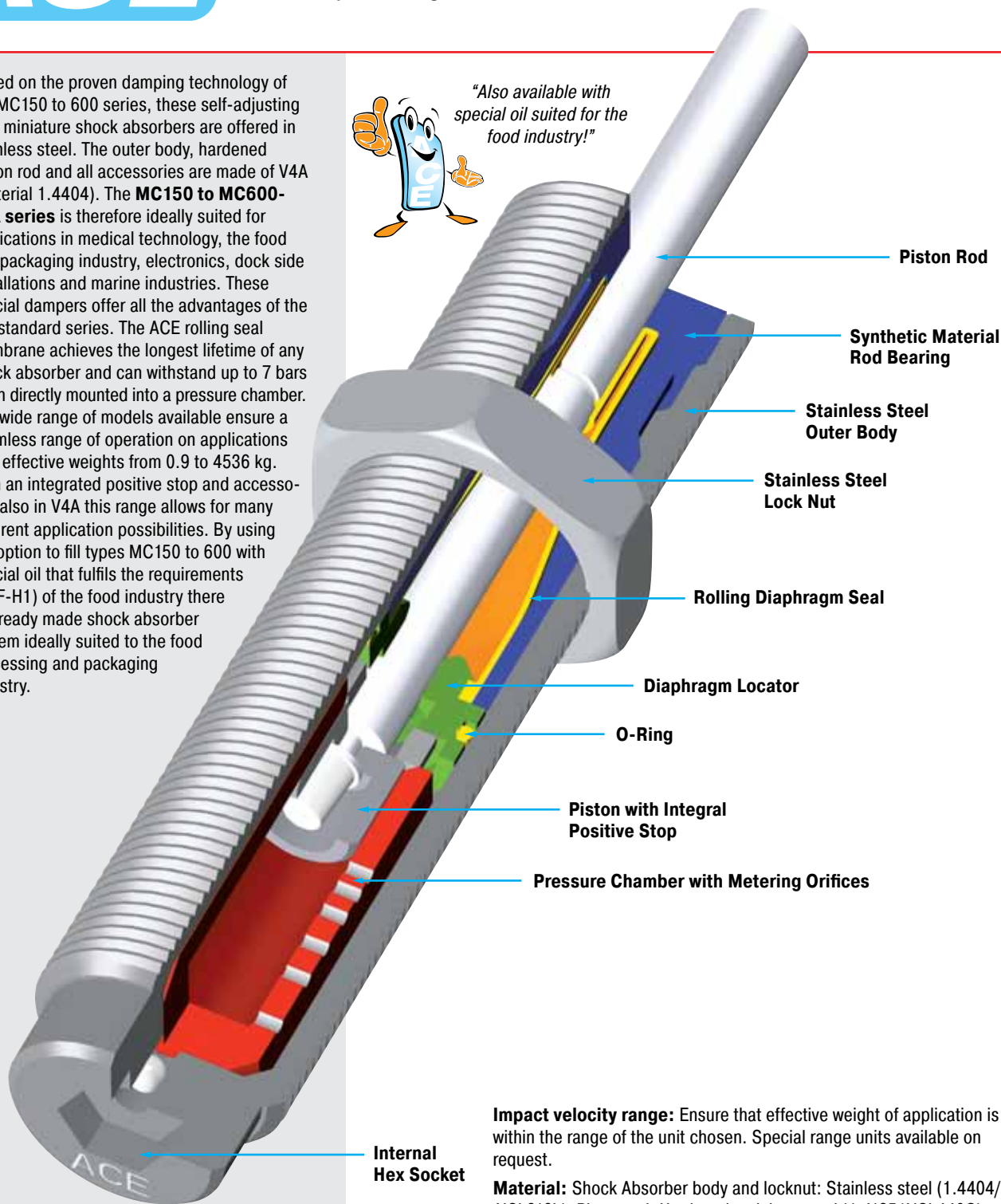
Type Part Number	Max. Energy Capacity		Effective Weight me Self-Compensating		Min. Return Force N	Max. Return Force N	Rod Reset Time s	1 Max. Side Load Angle °	Weight kg
	W ₃ Nm/Cycle	W ₄ Nm/h	me min. kg	me max. kg					
MC150EUM	20	34 000	0.9	10	3	8	0.4	4	0.06
MC150EUMH	20	34 000	8.6	86	3	8	0.4	4	0.06
MC150EUMH2	20	34 000	70	200	3	8	0.4	4	0.06
MC150EUMH3	20	34 000	181	408	3	8	1	4	0.06
MC225EUM	41	45 000	2.3	25	4	9	0.3	4	0.15
MC225EUMH	41	45 000	23	230	4	9	0.3	4	0.15
MC225EUMH2	41	45 000	180	910	4	9	0.3	4	0.15
MC225EUMH3	41	45 000	816	1 814	4	9	0.3	4	0.06
MC600EUM	136	68 000	9	136	5	10	0.6	2	0.26
MC600EUMH	136	68 000	113	1 130	5	10	0.6	2	0.26
MC600EUMH2	136	68 000	400	2 300	5	10	0.6	2	0.26
MC600EUMH3	136	68 000	2 177	4 536	5	10	0.6	2	0.26

¹ For applications with higher side load angles consider using the side load adaptor (BV) pages 37 to 40.

Based on the proven damping technology of the MC150 to 600 series, these self-adjusting ACE miniature shock absorbers are offered in stainless steel. The outer body, hardened piston rod and all accessories are made of V4A (material 1.4404). The **MC150 to MC600-V4A series** is therefore ideally suited for applications in medical technology, the food and packaging industry, electronics, dock side installations and marine industries. These special dampers offer all the advantages of the MC standard series. The ACE rolling seal membrane achieves the longest lifetime of any shock absorber and can withstand up to 7 bars when directly mounted into a pressure chamber. The wide range of models available ensure a seamless range of operation on applications with effective weights from 0.9 to 4536 kg. With an integrated positive stop and accessories also in V4A this range allows for many different application possibilities. By using the option to fill types MC150 to 600 with special oil that fulfils the requirements (NSF-H1) of the food industry there is a ready made shock absorber system ideally suited to the food processing and packaging industry.



"Also available with special oil suited for the food industry!"



Impact velocity range: Ensure that effective weight of application is within the range of the unit chosen. Special range units available on request.

Material: Shock Absorber body and locknut: Stainless steel (1.4404/AISI 316L). Piston rod: Hardened stainless steel (1.4125/AISI 440C). Rolling diaphragm seal: EPDM. Accessories: Stainless steel (1.4404/AISI 316L).

Note: Local contamination can affect the rolling seal and reduce the lifetime. Please contact ACE for a suitable solution.

W₄ capacity rating: (max. energy per hour Nm/hr) If your application exceeds the tabulated W₄ figures consider additional cooling i. e. cylinder exhaust air etc. Ask ACE for further details.

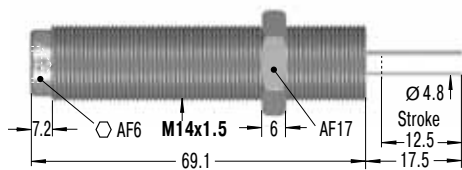
Mounting: In any position. If precise end position datum is required consider use of the optional stop collar type AH.

Operating temperature range: 0 °C to 66 °C

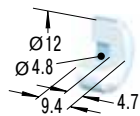
On request: Special oils, seals and special accessories.



MC150EUM-V4A

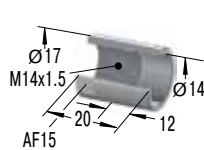


PP150



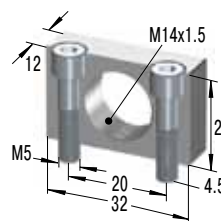
Nylon Button
W₃ max = 14 Nm

AH14-V4A



Stop Collar

MB14SC2-V4A



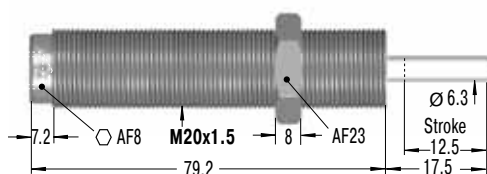
Mounting Block

KM14-V4A

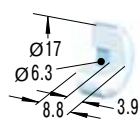


Locknut

MC225EUM-V4A

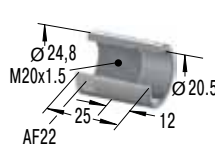


PP225



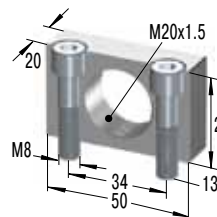
Nylon Button
W₃ max = 33 Nm

AH20-V4A



Stop Collar

MB20SC2-V4A



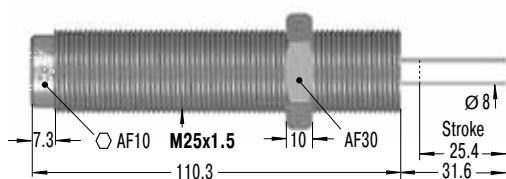
Mounting Block

KM20-V4A

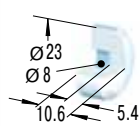


Locknut

MC600EUM-V4A

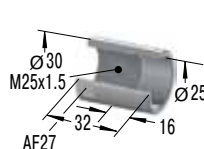


PP600



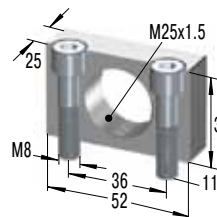
Nylon Button
W₃ max = 68 Nm

AH25-V4A



Stop Collar

MB25SC2-V4A



Mounting Block

KM25-V4A



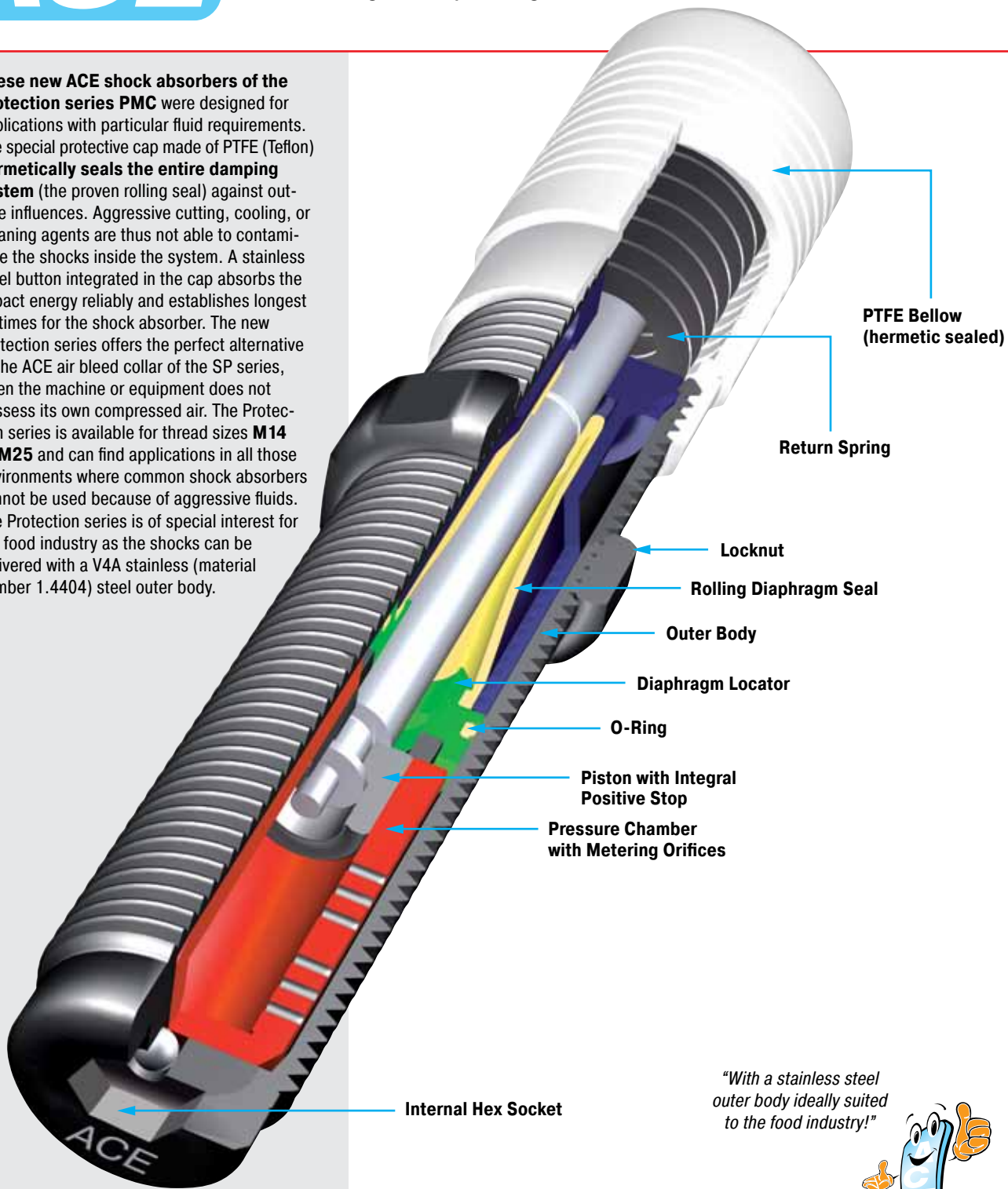
Locknut

Capacity Chart

Type Part Number	Max. Energy Capacity		Effective Weight me Self-Compensating		Min. Return Force N	Max. Return Force N	Rod Reset Time s	1 Max. Side Load Angle °	Weight kg
	W ₃ Nm/Cycle	W ₄ Nm/h	me min. kg	me max. kg					
MC150EUM-V4A	20	34 000	0.9	10	3	5	0.4	4	0.06
MC150EUMH-V4A	20	34 000	8.6	86	3	5	0.4	4	0.06
MC150EUMH2-V4A	20	34 000	70	200	3	5	0.4	4	0.06
MC150EUMH3-V4A	20	34 000	181	408	3	5	1	4	0.06
MC225EUM-V4A	41	45 000	2.3	25	4	6	0.3	4	0.14
MC225EUMH-V4A	41	45 000	23	230	4	6	0.3	4	0.15
MC225EUMH2-V4A	41	45 000	180	910	4	6	0.3	4	0.14
MC225EUMH3-V4A	41	45 000	816	1 814	4	6	0.3	4	0.05
MC600EUM-V4A	136	68 000	9	136	5	9	0.6	2	0.27
MC600EUMH-V4A	136	68 000	113	1 130	5	9	0.6	2	0.27
MC600EUMH2-V4A	136	68 000	400	2 300	5	9	0.6	2	0.29
MC600EUMH3-V4A	136	68 000	2 177	4 536	5	9	0.6	2	0.26

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

These new ACE shock absorbers of the Protection series PMC were designed for applications with particular fluid requirements. The special protective cap made of PTFE (Teflon) hermetically seals the entire damping system (the proven rolling seal) against outside influences. Aggressive cutting, cooling, or cleaning agents are thus not able to contaminate the shocks inside the system. A stainless steel button integrated in the cap absorbs the impact energy reliably and establishes longest lifetimes for the shock absorber. The new Protection series offers the perfect alternative to the ACE air bleed collar of the SP series, when the machine or equipment does not possess its own compressed air. The Protection series is available for thread sizes M14 to M25 and can find applications in all those environments where common shock absorbers cannot be used because of aggressive fluids. The Protection series is of special interest for the food industry as the shocks can be delivered with a V4A stainless (material number 1.4404) steel outer body.



"With a stainless steel outer body ideally suited to the food industry!"



Impact velocity range: Ensure that effective weight of application is within the range of the unit chosen. Special range units available on request.

Material: Bellow: PTFE. Steel insert: Stainless Steel 1.4404/AISI 316L. Shock absorber body: Nitride hardened steel or stainless steel 1.4404/AISI 316L.

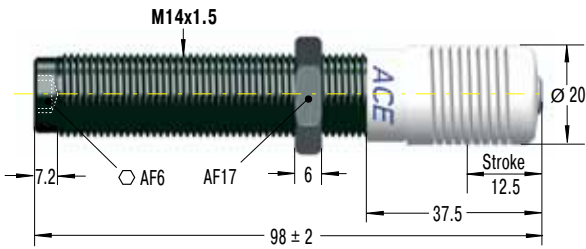
Note: Final preliminary test must be done on the application.

Mounting: In any position

Operating temperature range: 0 °C to 66 °C



PMC150EUM

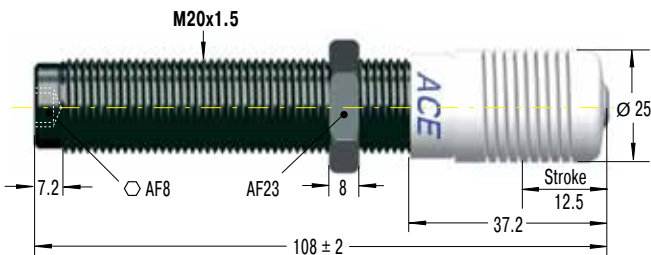


PMC150EUM-V4A



Dimensions as PMC150EUM

PMC225EUM

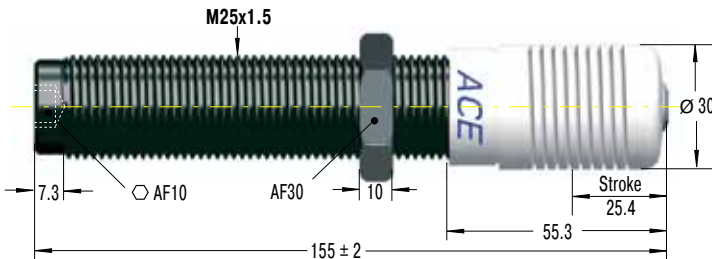


PMC225EUM-V4A



Dimensions as PMC225EUM

PMC600EUM



PMC600EUM-V4A



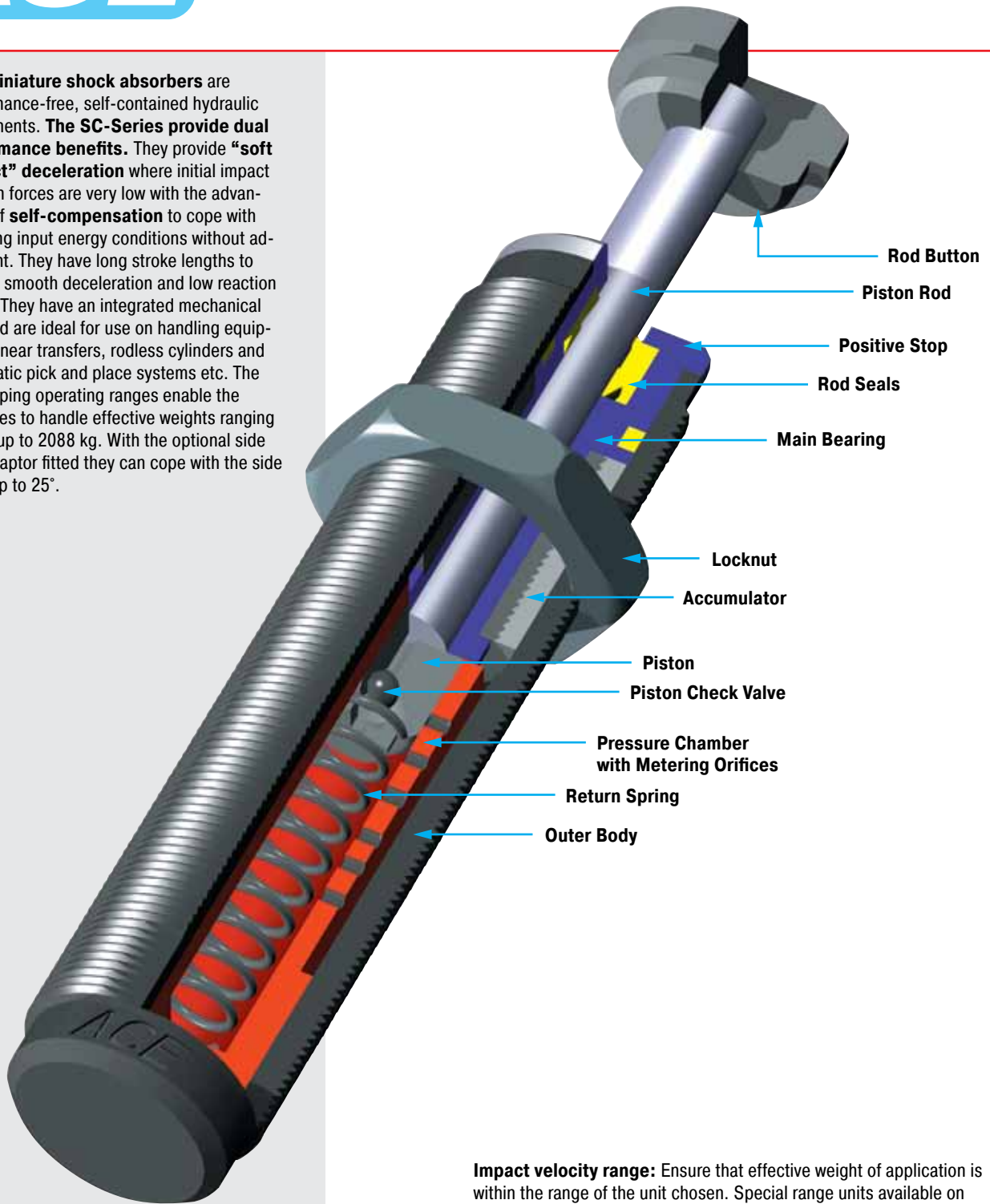
Dimensions as PMC600EUM

Capacity Chart

Type	Max. Energy Capacity		Effective Weight me Self-Compensating		Min. Return Force N	Max. Return Force N	Rod Reset Time s	Max. Side Load Angle °	Weight kg
	W ₃ Nm/Cycle	W ₄ Nm/h	me min. kg	me max. kg					
PMC150EUM	20	34 000	0.9	10	5	60	0.4	4	0.06
PMC150EUMH	20	34 000	8.6	86	5	60	0.4	4	0.06
PMC150EUMH2	20	34 000	70	200	5	60	0.4	4	0.06
PMC150EUMH3	20	34 000	181	408	5	60	1	4	0.06
PMC225EUM	41	45 000	2.3	25	5	65	0.3	4	0.15
PMC225EUMH	41	45 000	23	230	5	65	0.3	4	0.15
PMC225EUMH2	41	45 000	180	910	5	65	0.3	4	0.15
PMC225EUMH3	41	45 000	816	1 814	5	65	0.3	4	0.15
PMC600EUM	136	68 000	9	136	5	85	0.6	2	0.30
PMC600EUMH	136	68 000	113	1 130	5	85	0.6	2	0.30
PMC600EUMH2	136	68 000	400	2 300	5	85	0.6	2	0.30
PMC600EUMH3	136	68 000	2 177	4 536	5	85	0.6	2	0.30
Type									
PMC150EUM-V4A	20	34 000	0.9	10	5	60	0.4	4	0.06
PMC150EUMH-V4A	20	34 000	8.6	86	5	60	0.4	4	0.06
PMC150EUMH2-V4A	20	34 000	70	200	5	60	0.4	4	0.06
PMC150EUMH3-V4A	20	34 000	181	408	5	60	1	4	0.06
PMC225EUM-V4A	41	45 000	2.3	25	5	65	0.3	4	0.15
PMC225EUMH-V4A	41	45 000	23	230	5	65	0.3	4	0.15
PMC225EUMH2-V4A	41	45 000	180	910	5	65	0.3	4	0.15
PMC225EUMH3-V4A	41	45 000	816	1 814	5	65	0.3	4	0.15
PMC600EUM-V4A	136	68 000	9	136	5	85	0.6	2	0.30
PMC600EUMH-V4A	136	68 000	113	1 130	5	85	0.6	2	0.30
PMC600EUMH2-V4A	136	68 000	400	2 300	5	85	0.6	2	0.30
PMC600EUMH3-V4A	136	68 000	2 177	4 536	5	85	0.6	2	0.30

Issue 6.2011 Specifications subject to change

ACE miniature shock absorbers are maintenance-free, self-contained hydraulic components. The SC-Series provide dual performance benefits. They provide “soft contact” deceleration where initial impact reaction forces are very low with the advantages of self-compensation to cope with changing input energy conditions without adjustment. They have long stroke lengths to provide smooth deceleration and low reaction forces. They have an integrated mechanical stop and are ideal for use on handling equipment, linear transfers, rodless cylinders and pneumatic pick and place systems etc. The overlapping operating ranges enable the SC series to handle effective weights ranging 0.7 kg up to 2088 kg. With the optional side load adaptor fitted they can cope with the side loads up to 25°.



Impact velocity range: Ensure that effective weight of application is within the range of the unit chosen. Special range units available on request.

Material: Shock absorber body: Nitride hardened steel. Accessories: Steel with black oxide finish or nitride hardened. Piston rod: Hardened stainless steel.

W₄ capacity rating: (max. energy per hour Nm/hr) If your application exceeds the tabulated W₄ figures consider additional cooling i. e. cylinder exhaust air etc. Ask ACE for further details.

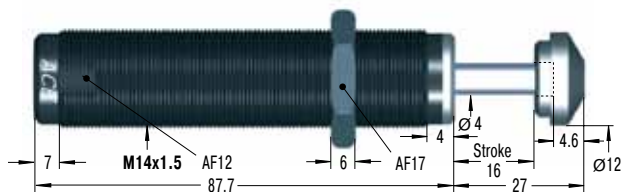
Mounting: In any position. If precise end position datum is required consider use of the optional stop collar type AH.

Operating temperature range: 0 °C to 66 °C

On request: Weartec finish (seawater resistant). Other special finishes available to special order.

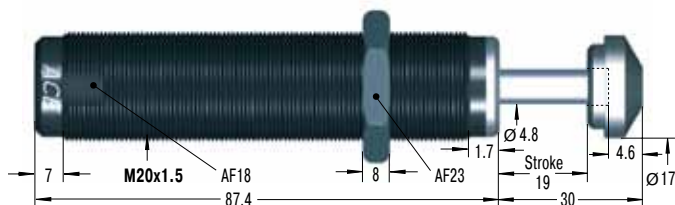


SC190EUM



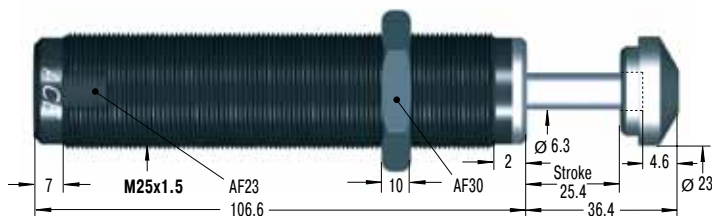
M14x1 and M16x1 also available to special order
Accessories, mounting, installation ... see pages 37 to 41.

SC300EUM



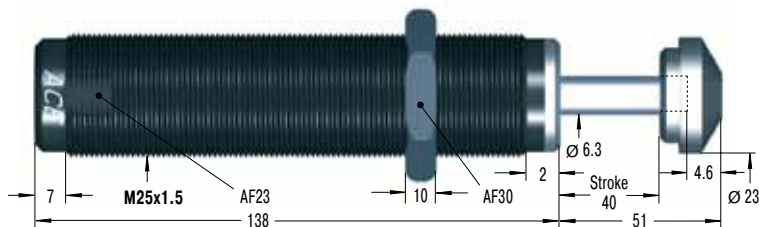
M22x1.5 also available to special order
Accessories, mounting, installation ... see pages 38 to 41.

SC650EUM



M26x1.5 also available to special order
Accessories, mounting, installation ... see pages 38 to 41.

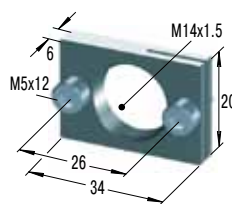
SC925M



Accessories, mounting, installation ... see pages 38 to 41.

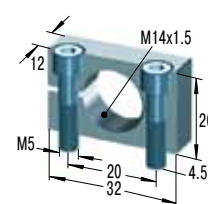
Available without rod end button on request.

RF14



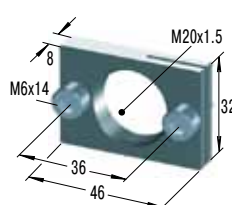
Rectangular Flange

MB14



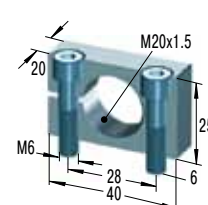
Clamp Mount

RF20



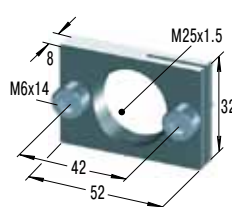
Rectangular Flange

MB20



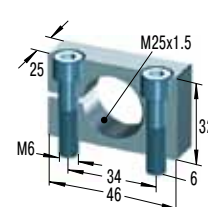
Clamp Mount

RF25



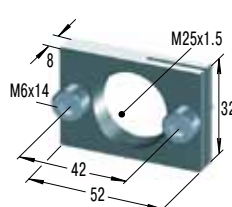
Rectangular Flange

MB25



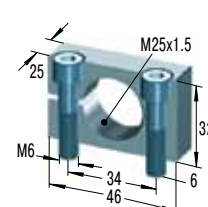
Clamp Mount

RF25



Rectangular Flange

MB25



Clamp Mount

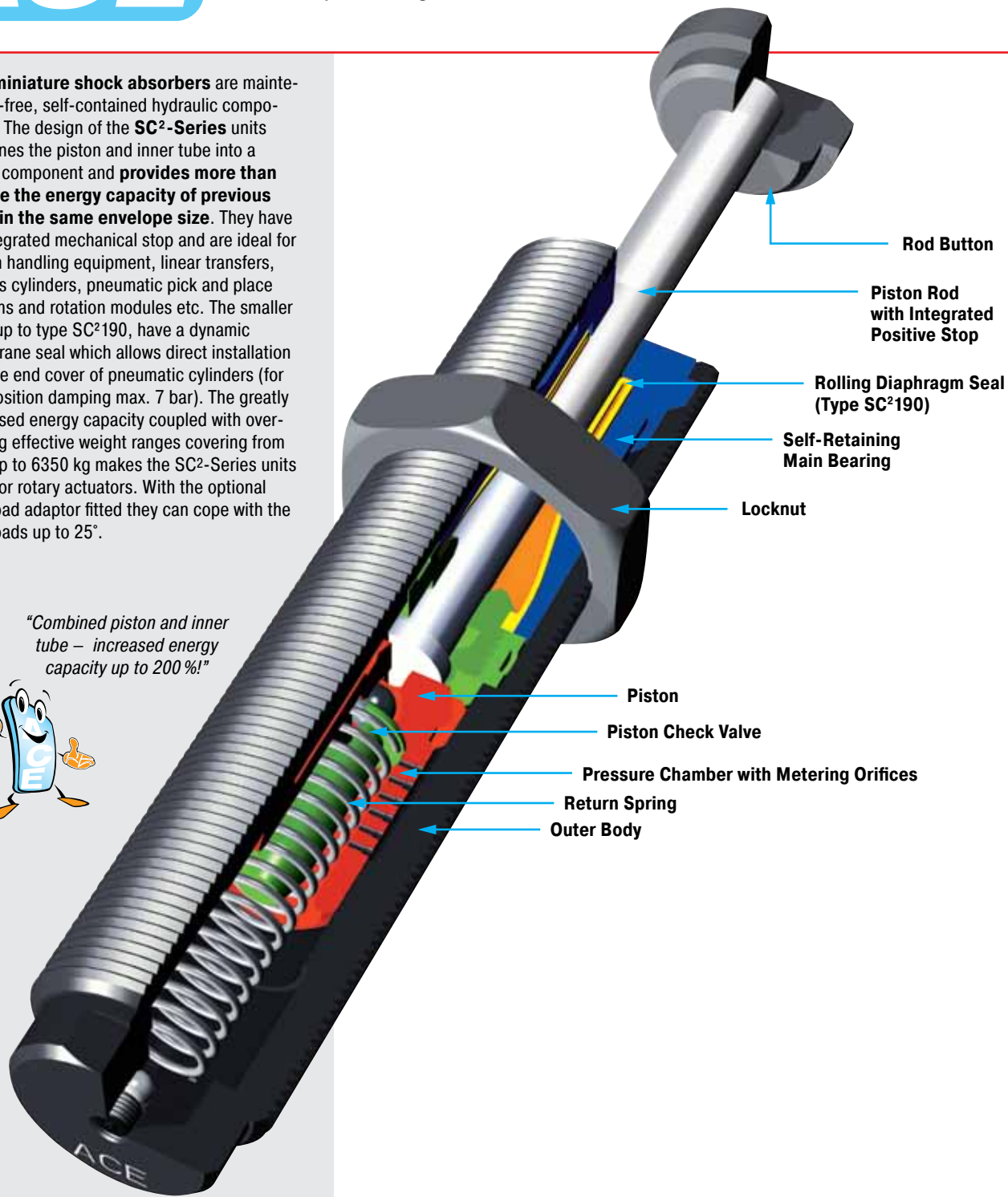
Capacity Chart

Type Part Number	Max. Energy Capacity		Effective Weight me				Min. Return Force N	Max. Return Force N	Rod Reset Time s	1 Max. Side Load Angle °	Weight kg
	W ₃ Nm/Cycle	W ₄ Nm/h	Soft-Contact me min. kg	Soft-Contact me max. kg	Self-Compensating me min. kg	Self-Compensating me max. kg					
SC190EUM-0	25	34 000	—	—	0.7	4	4	9	0.25	5	0.08
SC190EUM-1	25	34 000	2.3	6	1.4	7	4	9	0.25	5	0.08
SC190EUM-2	25	34 000	5.5	16	3.6	18	4	9	0.25	5	0.08
SC190EUM-3	25	34 000	14	41	9	45	4	9	0.25	5	0.08
SC190EUM-4	25	34 000	34	91	23	102	4	9	0.25	5	0.08
SC300EUM-0	33	45 000	—	—	0.7	4	5	10	0.1	5	0.11
SC300EUM-1	33	45 000	2.3	7	1.4	8	5	10	0.1	5	0.11
SC300EUM-2	33	45 000	7	23	4.5	27	5	10	0.1	5	0.11
SC300EUM-3	33	45 000	23	68	14	82	5	10	0.1	5	0.11
SC300EUM-4	33	45 000	68	181	32	204	5	10	0.1	5	0.11
SC650EUM-0	73	68 000	—	—	2.3	14	11	32	0.2	5	0.31
SC650EUM-1	73	68 000	11	36	8	45	11	32	0.2	5	0.31
SC650EUM-2	73	68 000	34	113	23	136	11	32	0.2	5	0.31
SC650EUM-3	73	68 000	109	363	68	408	11	32	0.2	5	0.31
SC650EUM-4	73	68 000	363	1 089	204	1 180	11	32	0.2	5	0.31
SC925EUM-0	110	90 000	8	25	4.5	29	11	32	0.4	5	0.39
SC925EUM-1	110	90 000	22	72	14	90	11	32	0.4	5	0.39
SC925EUM-2	110	90 000	59	208	40	272	11	32	0.4	5	0.39
SC925EUM-3	110	90 000	181	612	113	726	11	32	0.4	5	0.39
SC925EUM-4	110	90 000	544	1 952	340	2 088	11	32	0.4	5	0.39

¹ For applications with higher side load angles consider using the side load adaptor (BV) pages 37 to 40.

ACE miniature shock absorbers are maintenance-free, self-contained hydraulic components. The design of the **SC²-Series** units combines the piston and inner tube into a single component and **provides more than double the energy capacity of previous units in the same envelope size**. They have an integrated mechanical stop and are ideal for use on handling equipment, linear transfers, rodless cylinders, pneumatic pick and place systems and rotation modules etc. The smaller sizes up to type SC²190, have a dynamic membrane seal which allows direct installation into the end cover of pneumatic cylinders (for end position damping max. 7 bar). The greatly increased energy capacity coupled with overlapping effective weight ranges covering from 1 kg up to 6350 kg makes the SC²-Series units ideal for rotary actuators. With the optional side load adaptor fitted they can cope with the side loads up to 25°.

"Combined piston and inner tube – increased energy capacity up to 200 %!"



Impact velocity range: Ensure that effective weight of application is within the range of the unit chosen. Special range units available on request.

Material: Shock absorber body: Nitride hardened steel. Accessories: Steel with black oxide finish or nitride hardened. Piston rod: Hardened stainless steel.

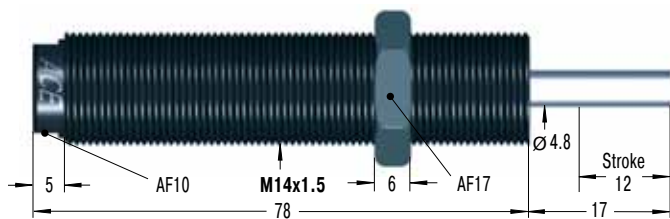
Mounting: In any position. If precise end position datum is required consider use of the optional stop collar type AH.

Operating temperature range: 0 °C to 66 °C

On request: Weartec finish (seawater resistant). Other special finishes available to special order.



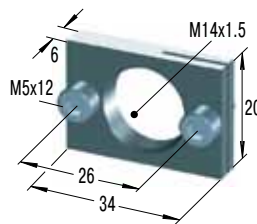
SC190EUM



M14x1 also available to special order

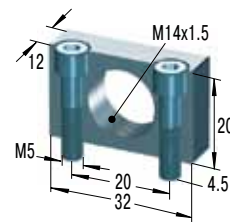
Accessories, mounting, installation ... see pages 37 to 41.

RF14



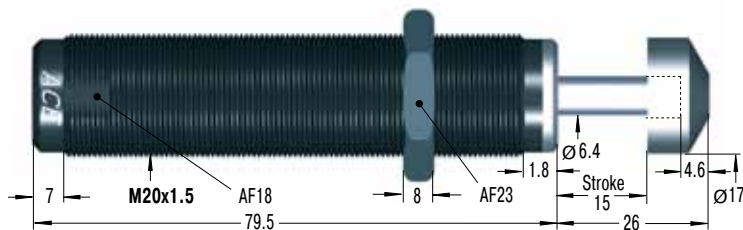
Rectangular Flange

MB14SC2



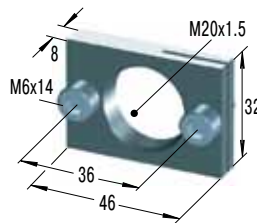
Mounting Block

SC300EUM



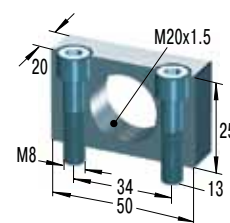
Accessories, mounting, installation ... see pages 38 to 41.

RF20



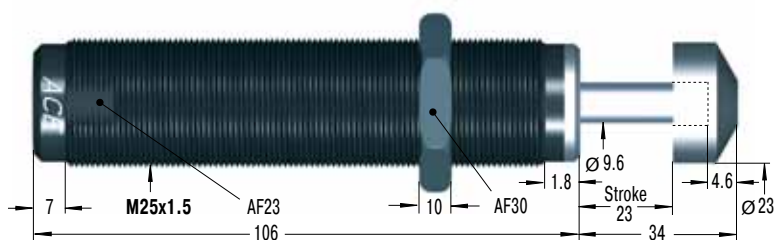
Rectangular Flange

MB20SC2



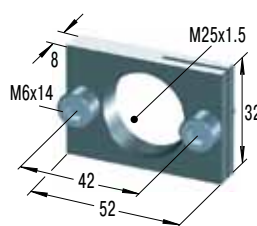
Mounting Block

SC650EUM



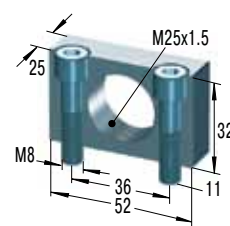
Accessories, mounting, installation ... see pages 38 to 41.

RF25



Rectangular Flange

MB25SC2



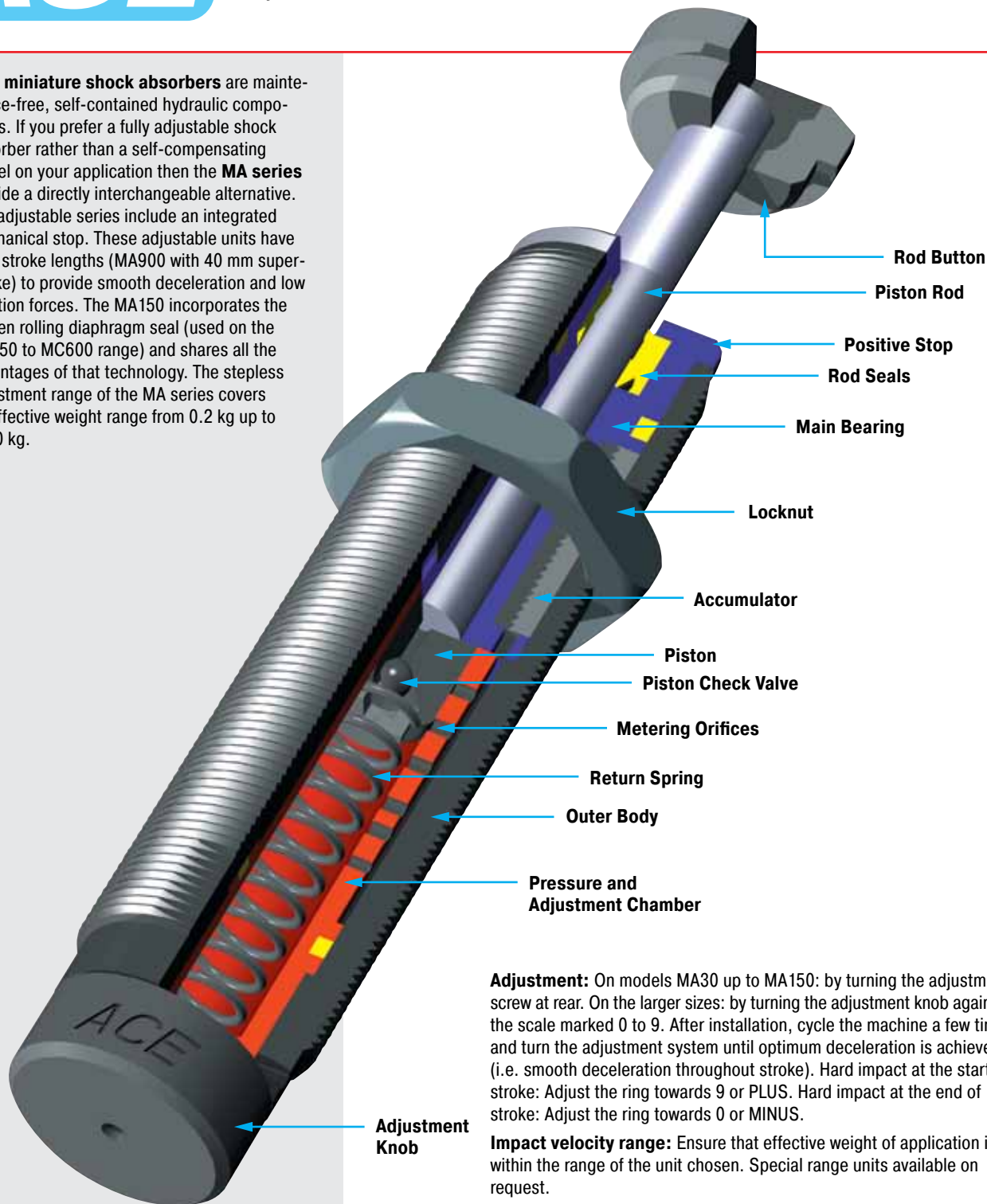
Mounting Block

Capacity Chart

Type	Max. Energy Capacity		Effective Weight me					Min. Return Force N	Max. Return Force N	Rod Reset Time s	1 Max. Side Load Angle °	Weight kg
	W ₃ Nm/Cycle	W ₄ Nm/h	Soft									
			-5 min. kg	-5 max. kg	-6 min. kg	-6 max. kg	-7 min. kg					
SC190EUM	31	50 000	2 - 16	13 - 140	136 - 1 550	-	-	6	19	0.4	2	0.060
SC300EUM	73	45 000	11 - 45	34 - 136	91 - 181	135 - 680	320 - 1 950	8	18	0.2	5	0.164
SC650EUM	210	68 000	23 - 113	90 - 360	320 - 1 090	770 - 2 630	1 800 - 6 350	11	33	0.3	5	0.315

¹ For applications with higher side load angles consider using the side load adaptor (BV) pages 36 to 40.

ACE miniature shock absorbers are maintenance-free, self-contained hydraulic components. If you prefer a fully adjustable shock absorber rather than a self-compensating model on your application then the **MA series** provide a directly interchangeable alternative. The adjustable series include an integrated mechanical stop. These adjustable units have long stroke lengths (MA900 with 40 mm super-stroke) to provide smooth deceleration and low reaction forces. The MA150 incorporates the proven rolling diaphragm seal (used on the MC150 to MC600 range) and shares all the advantages of that technology. The stepless adjustment range of the MA series covers an effective weight range from 0.2 kg up to 2040 kg.



Adjustment: On models MA30 up to MA150: by turning the adjustment screw at rear. On the larger sizes: by turning the adjustment knob against the scale marked 0 to 9. After installation, cycle the machine a few times and turn the adjustment system until optimum deceleration is achieved (i.e. smooth deceleration throughout stroke). 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.

Impact velocity range: Ensure that effective weight of application is within the range of the unit chosen. Special range units available on request.

Material: Shock absorber body: Nitride hardened steel. Accessories: Steel with black oxide finish or nitride hardened. Piston rod: Hardened stainless steel.

W₄ capacity rating: (max. energy per hour Nm/hr) If your application exceeds the tabulated W₄ figures consider additional cooling i.e. cylinder exhaust air etc. Ask ACE for further details.

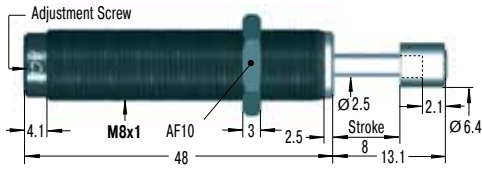
Mounting: In any position. If precise end position datum is required consider use of the optional stop collar type AH. Install a mechanical stop 0.5 to 1 mm before end of stroke on FA1008.

Operating temperature range: 0 °C to 66 °C

On request: Weartec finish (seawater resistant). Other special finishes available to special order.

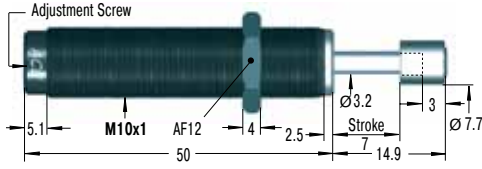


MA30EUM



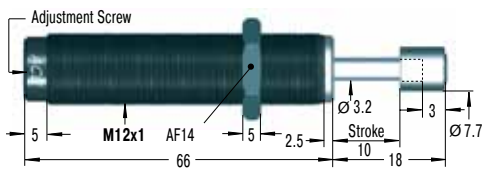
Accessories, mounting, installation ... see pages 36 to 41.

MA50EUM for use on new installations



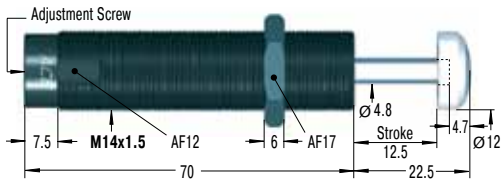
Accessories, mounting, installation ... see pages 36 to 41.

MA35EUM



Accessories, mounting, installation ... see pages 37 to 41.

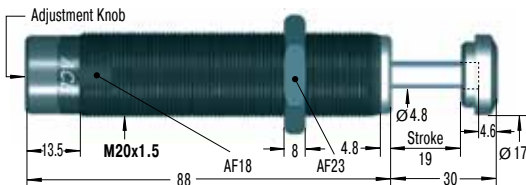
MA150EUM



M14x1 also available to special order

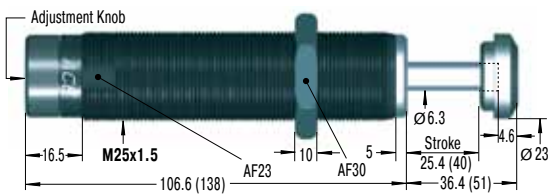
Accessories, mounting, installation ... see pages 37 to 41.

MA225EUM



Accessories, mounting, installation ... see pages 38 to 41.

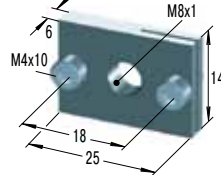
MA600EUM and MA900EUM



MA600EUML with M27x3 available to special order

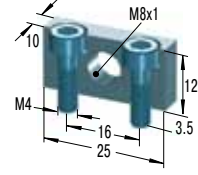
Accessories, mounting, installation ... see pages 38 to 41.

RF8



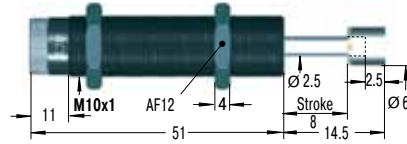
Rectangular Flange

MB8SC2



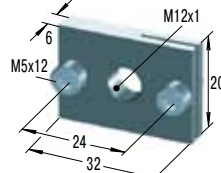
Mounting Block

FA1008VD-B still available in future



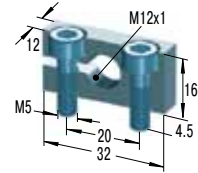
Accessories, mounting, installation ... see pages 36 to 41.

RF12



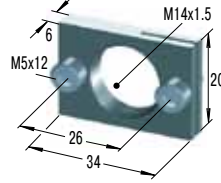
Rectangular Flange

MB12



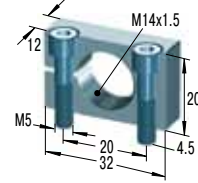
Clamp Mount

RF14



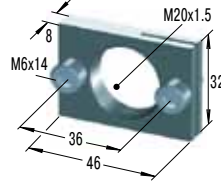
Rectangular Flange

MB14



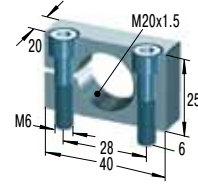
Clamp Mount

RF20



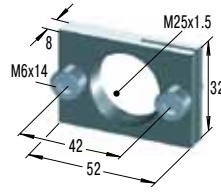
Rectangular Flange

MB20



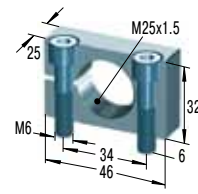
Clamp Mount

RF25



Rectangular Flange

MB25



Clamp Mount

Available without rod end button on request. Models MA600EUM/MA900EUM available with clevis mounting.

Capacity Chart

Type Part Number	Max. Energy Capacity		Effective Weight me Adjustable		Min. Return Force N	Max. Return Force N	Rod Reset Time s	1 Max. Side Load Angle	Weight kg
	W ₃ Nm/Cycle	W ₄ Nm/h	me min. kg	me max. kg					
MA30EUM	3.5	5 650	0.23	15	1.7	5.3	0.3	2	0.013
FA1008VD-B	1.8	3 600	0.2	10	3	6	0.3	2.5	0.026
MA50EUM	5.5	13 550	4.5	20	3	6	0.3	2	0.025
MA35EUM	4	6 000	6	57	5	11	0.2	2	0.043
MA150EUM	22	35 000	1	109	3	5	0.4	2	0.06
MA225EUM	25	45 000	2.3	226	5	10	0.1	2	0.13
MA600EUM	68	68 000	9	1 360	10	30	0.2	2	0.31
MA900EUM	100	90 000	14	2 040	10	35	0.4	1	0.4

1 For applications with higher side load angles consider using the side load adaptor (BV) pages 36 to 40.

Selection Chart for Shock Absorber Accessories



Locknut



Stop Collar



¹ Clamp Mount/
Mounting Block



Rectangular
Flange



Universal Mount



² Side Load
Adaptor

Shock Absorber Type

KM

AH

MB

RF

UM

BV

Thread Size M5x0.5

MC5EUM

KM5

AH5

MB5SC2

–

–

–

Thread Size M6x0.5

MC9EUM

KM6

AH6

MB6SC2

RF6

–

–

Thread Size M8x1

MA30EUM

KM8

AH8

MB8SC2

RF8

–

BV8

MC10EUM

KM8

AH8

MB8SC2

RF8

–

BV8A

MC30EUM

KM8

AH8

MB8SC2

RF8

–

BV8

Thread Size M10x1

FA1008VD-B

KM10

AH10

MB10SC2

RF10

UM10

–

MA50EUM

KM10

AH10

MB10SC2

RF10

UM10

BV10

MC25EUM

KM10

AH10

MB10SC2

RF10

UM10

BV10

Thread Size M12x1

MA35EUM

KM12

AH12

MB12

RF12

UM12

BV12

MC75EUM

KM12

AH12

MB12

RF12

UM12

BV12

Thread Size M14x1.5

MA150EUM

KM14

AH14

MB14

RF14

UM14

BV14

MC150EUM

KM14

AH14

MB14

RF14

UM14

BV14

SC190EUM0-4

KM14

AH14

MB14

RF14

UM14

BV14SC

SC190EUM5-7

KM14

AH14

MB14SC2

RF14

UM14

BV14

Thread Size M20x1.5

MA225EUM

KM20

AH20

MB20

RF20

UM20

BV20SC

MC225EUM

KM20

AH20

MB20

RF20

UM20

BV20

SC300EUM0-4

KM20

AH20

MB20

RF20

UM20

BV20SC

SC300EUM5-9

KM20

AH20

MB20SC2

RF20

UM20

BV20SC

Thread Size M25x1.5

MA600EUM

KM25

AH25

MB25

RF25

UM25

BV25SC

MA900EUM

KM25

AH25

MB25

RF25

UM25

–

MC600EUM

KM25

AH25

MB25

RF25

UM25

BV25

SC650EUM0-4

KM25

AH25

MB25

RF25

UM25

BV25SC

SC650EUM5-9

KM25

AH25

MB25SC2

RF25

UM25

BV25SC

SC925EUM

KM25

AH25

MB25

RF25

UM25

–

¹ Use a locknut for protection if a clamp mount MB...SC2 is installed.

² Only mountable on units without button.

Remove the button from the shock absorber, if there's one fitted. See page 40.



² Steel Shroud



Air Bleed Collar



Switch Stop Collar



Steel Button



Steel/Urethane Button



Nylon Button

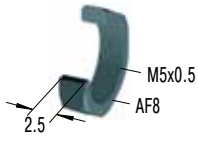
PB	SP	AS	PS	BP	PP	Page
Thread Size M5x0.5						
-	-	-	-	-	-	36
Thread Size M6x0.5						
-	-	-	-	-	-	36
Thread Size M8x1						
PB8	-	-	-	-	-	36
PB8-A	-	-	-	-	-	36
PB8	-	-	-	-	-	36
Thread Size M10x1						
-	-	-	-	-	-	36
PB10	-	AS10	PS10	-	-	36
PB10	-	AS10	PS10	-	-	36
Thread Size M12x1						
PB12	-	AS12	PS12	-	-	37
PB12	-	AS12	PS12	-	-	37
Thread Size M14x1.5						
PB14	SP14	AS14	PS14	-	included	37
PB14	SP14	AS14	PS14	-	PP150	37
PB14SC	-	AS14	included	BP14	-	37
PB14	SP14	AS14	PS14	-	-	
Thread Size M20x1.5						
PB20SC	-	AS20	included	BP20	-	38
PB20	SP20	AS20	PS20	-	PP225	38
PB20SC	-	AS20	included	BP20	-	38
PB20SC	-	AS20	included	-	-	38
Thread Size M25x1.5						
PB25SC	-	AS25	included	BP25	-	38
-	-	AS25	included	BP25	-	38
PB25	SP25	AS25	PS25	-	PP600	38
PB25SC	-	AS25	included	BP25	-	38
PB25	-	AS25	included	-	-	38
-	-	AS25	included	BP25	-	38

² Only mountable on units without button.
Remove the button from the shock absorber, if there's one fitted. See page 40.

Dimensions see pages 36 to 38.

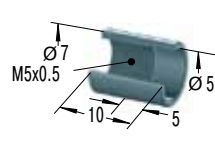
M5x0.5

KM5



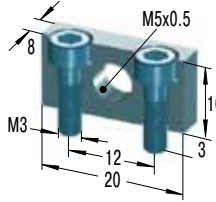
Locknut

AH5



Stop Collar

MB5SC2



Mounting Block

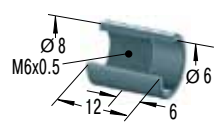
M6x0.5

KM6



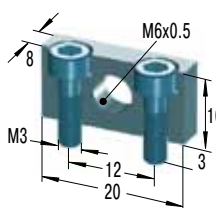
Locknut

AH6



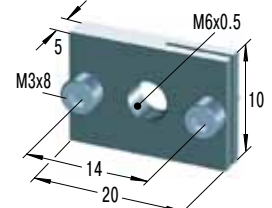
Stop Collar

MB6SC2



Mounting Block

RF6



Rectangular Flange

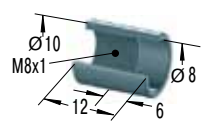
M8x1

KM8



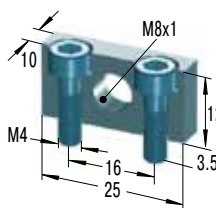
Locknut

AH8



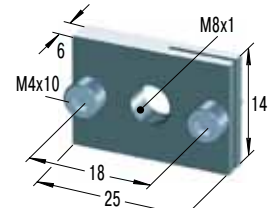
Stop Collar

MB8SC2



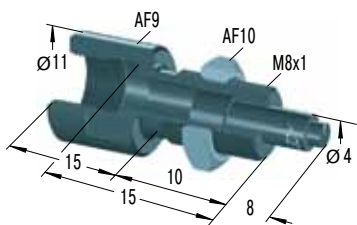
Mounting Block

RF8



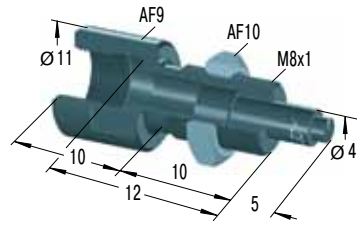
Rectangular Flange

BV8



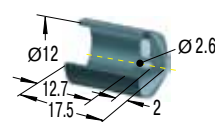
Side Load Adaptor

BV8A



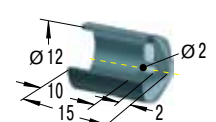
Side Load Adaptor

PB8



Steel Shroud

PB8-A



Steel Shroud

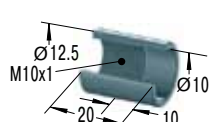
M10x1

KM10



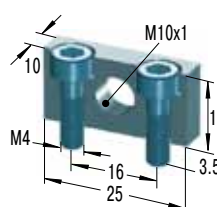
Locknut

AH10



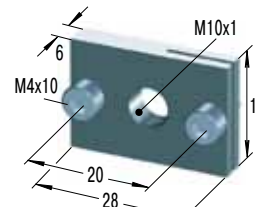
Stop Collar

MB10SC2



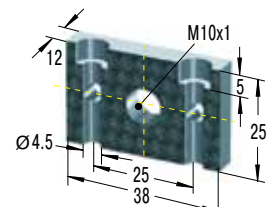
Mounting Block

RF10



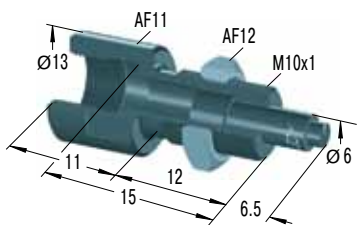
Rectangular Flange

UM10



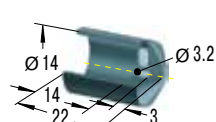
Universal Mount

BV10



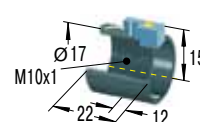
Side Load Adaptor

PB10



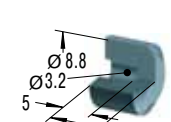
Steel Shroud

AS10



Switch Stop Collar
inc. Proximity Switch

PS10



Steel Button

Mounting, installation... see pages 39 to 41.

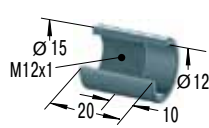
M12x1

KM12



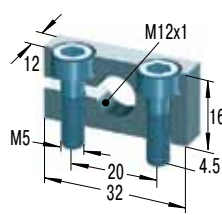
Locknut

AH12



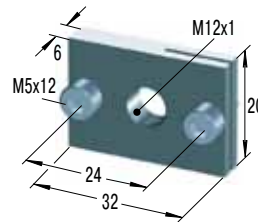
Stop Collar

MB12



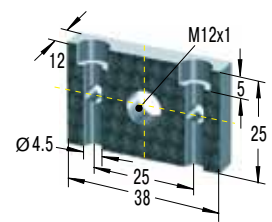
Clamp Mount

RF12



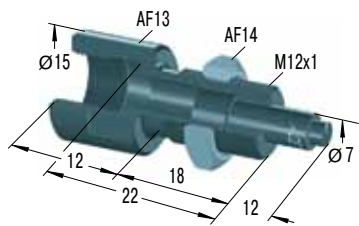
Rectangular Flange

UM12



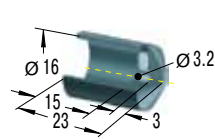
Universal Mount

BV12



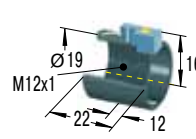
Side Load Adaptor

PB12



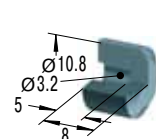
Steel Shroud

AS12



Switch Stop Collar
inc. Proximity Switch

PS12



Steel Button

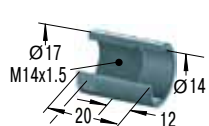
M14x1.5

KM14



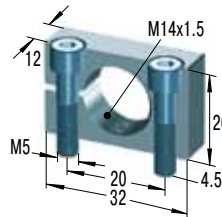
Locknut

AH14



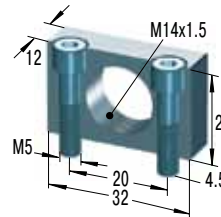
Stop Collar

MB14



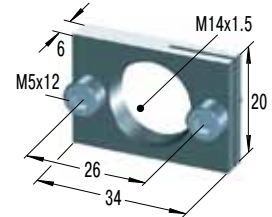
Clamp Mount

MB14SC2



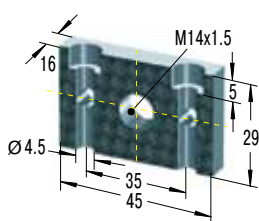
Mounting Block

RF14



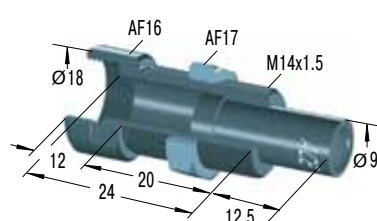
Rectangular Flange

UM14



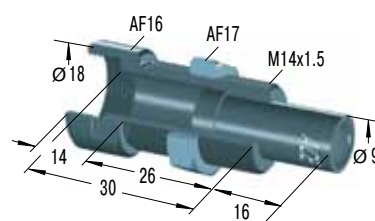
Universal Mount

BV14



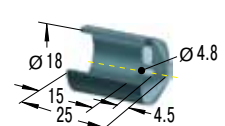
Side Load Adaptor

BV14SC



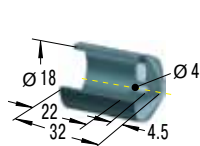
Side Load Adaptor

PB14



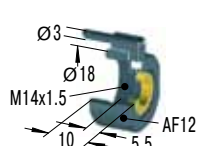
Steel Shroud

PB14SC



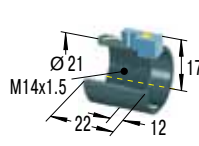
Steel Shroud

SP14



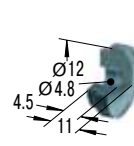
Air Bleed Collar

AS14



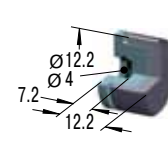
Switch Stop Collar
inc. Proximity Switch

PS14



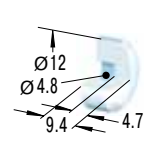
Steel Button

BP14



Steel/Urethane
Button

PP150



Nylon Button
W₃ max = 14 Nm

Mounting, installation... see pages 39 to 41.

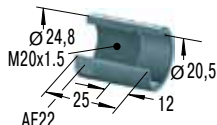
M20x1.5

KM20



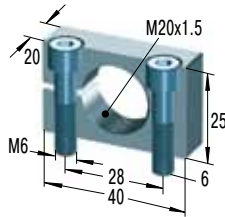
Locknut

AH20



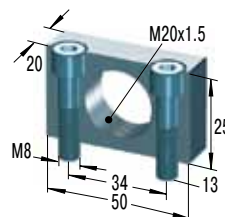
Stop Collar

MB20



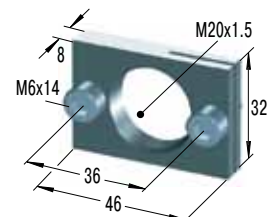
Clamp Mount

MB20SC2



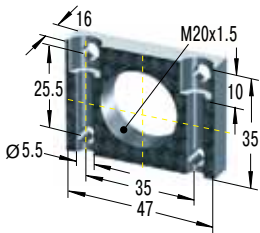
Mounting Block

RF20



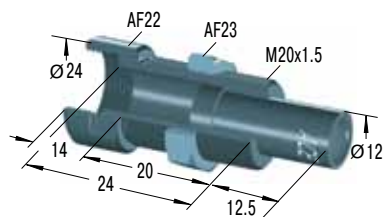
Rectangular Flange

UM20



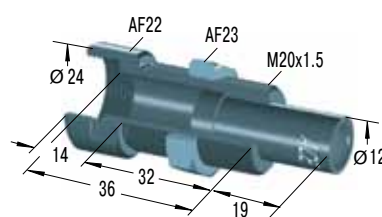
Universal Mount

BV20



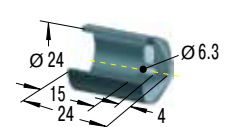
Side Load Adaptor

BV20SC



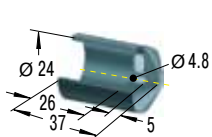
Side Load Adaptor

PB20



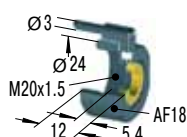
Steel Shroud

PB20SC



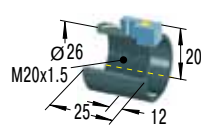
Steel Shroud

SP20



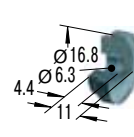
Air Bleed Collar

AS20



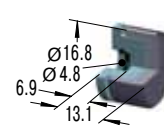
Switch Stop Collar
inc. Proximity Switch

PS20



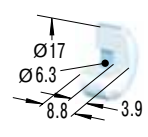
Steel Button

BP20



Steel/Urethane
Button

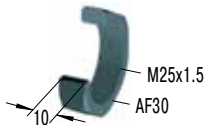
PP225



Nylon Button
W₃ max = 33 Nm

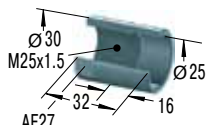
M25x1.5

KM25



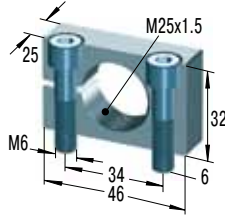
Locknut

AH25



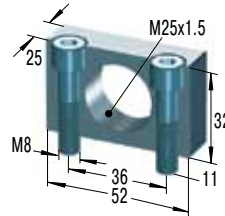
Stop Collar

MB25



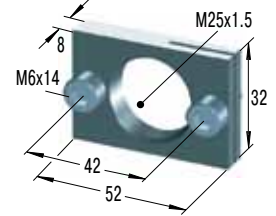
Clamp Mount

MB25SC2



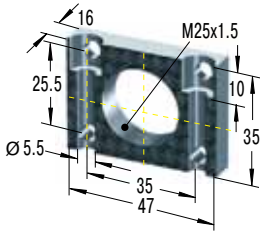
Mounting Block

RF25



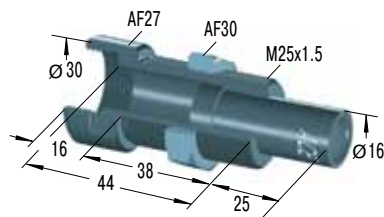
Rectangular Flange

UM25



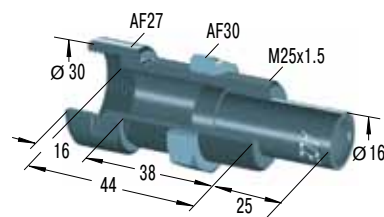
Universal Mount

BV25



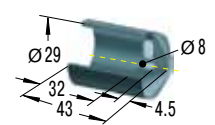
Side Load Adaptor

BV25SC



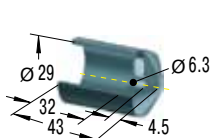
Side Load Adaptor

PB25



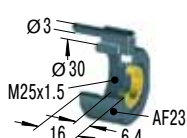
Steel Shroud

PB25SC



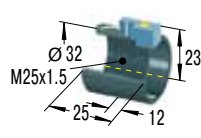
Steel Shroud

SP25



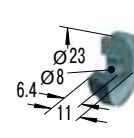
Air Bleed Collar

AS25



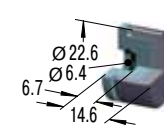
Switch Stop Collar
inc. Proximity Switch

PS25



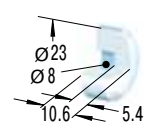
Steel Button

BP25



Steel/Urethane
Button

PP600

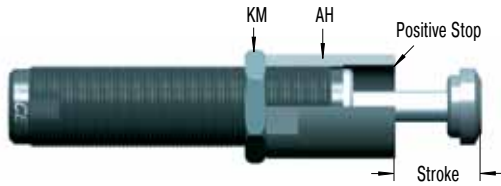


Nylon Button
W₃ max = 68 Nm

Mounting, installation... see pages 39 to 41.

AH Stop Collar

All ACE miniature shock absorbers (except FA series) have an **integral positive stop**. An **optional stop collar (AH...)** can be added if desired to give fine adjustment of final stopping position.



MB Clamp Mount/Mounting Block

When using the MB clamp mount no locknut is needed on the shock absorber (split clamp action). The mounting block is very compact and allows fine adjustment of the shock absorber position by turning in and out. Two socket head screws are included with clamp mount block. **When foot mounting the types with combined piston and inner tube SC²190EUM to SC²650EUM and the types MC5EUM, MC9EUM, MC30EUM, MC25EUM and MA30EUM, the MB (SC²) must be used.**



Clamp slot design not for use with SC²

Type	Screw Size	Max. Torque	Type	Screw Size	Max. Torque
MB10	M4x14	4 Nm	MB20	M6x25	11 Nm
MB12	M5x16	6 Nm	MB25	M6x30	11 Nm
MB14	M5x20	6 Nm			

RF Rectangular Flange

The rectangular flange RF provides a space saving convenient assembly and does not need a lock nut to hold the shock absorber. Therefore achieving a neat, compact and flat surface mounting.

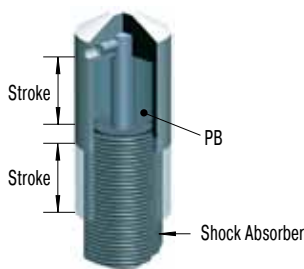


Type	Screw Size	Max. Torque	Type	Screw Size	Max. Torque
RF6	M3x8	3 Nm	RF14	M5x12	6 Nm
RF8	M4x10	4 Nm	RF20	M6x14	11 Nm
RF10	M4x10	4 Nm	RF25	M6x14	11 Nm
RF12	M5x12	6 Nm			

PB Steel Shroud

Grinding beads, sand, welding splatter, paints and 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.

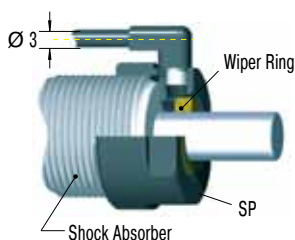
Note! When installing don't forget to allow operating space for the shroud to move as the shock absorber is cycled. For part number MA, MC, SC please order with "M-880" suffix. Part numbers MA150EUM, MC150EUM to MC600EUM and SC190EUM5-7 are supplied without a button, for advice on removing the button see page 40.



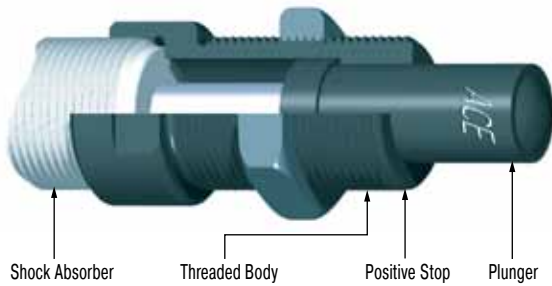
SP Air Bleed Collar

Air bleed collar (includes integral stop collar) protects shock absorber from ingress of abrasive contaminants like cement, paper or wood dust into the rod seal area. It also prevents aggressive fluids such as cutting oils, coolants etc. damaging the seals. Air bleed supply 0.5 to 1 bar. Low air consumption. The constant air bleed prevents contaminants passing the wiper ring and entering the shock absorber seal area.

Note! Do not switch off air supply whilst machine is operating! The air bleed collar cannot be used on all similar body thread sized shock absorbers. The air bleed collar is only for types MC150EUM to MC600EUM, MA150EUM and SC190EUM5-7.



BV / BV...SC Side Load Adaptor

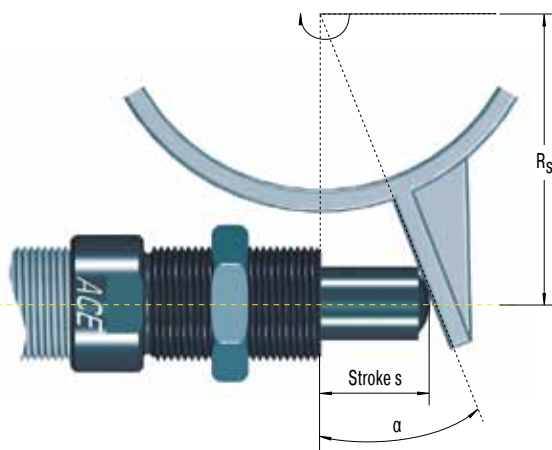


With side load impact angles of more than 3° the operation lifetime of the shock absorber reduces rapidly due to increased wear of the rod bearings. The optional BV side load adaptor provides long lasting solution. Secure the side load adaptor with Loctite or locknut on the shock absorber.

Material: Threaded body and plunger: Hardened high tensile steel. Hardened 610 HV1.

Note: 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.

Note! Installation with clamp mount MB... not possible. Use mounting block MB... SC².



Problem: Rotating impact motion causes high side load forces on the piston rod. This increases bearing wear and possibly results in rod breakage or bending.

Solution: Install side load adaptor BV.

Formulae:

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

Example:

s = 0.025 m

$\alpha \max = 25^\circ$ (Type BV25)

$R_s = 0.1 \text{ m}$

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

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

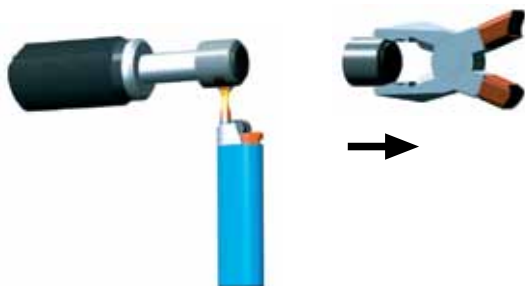
α = side load angle ° R_s = mounting radius m
 $\alpha \max$ = max. angle ° $R_{s \min}$ = min. possible mounting radius m
s = absorber stroke m

Maximum angle:

BV8, BV10 and BV12 = 12.5°

BV14, BV20 and BV25 = 25°

Note: 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.



Time required for warming up the button:

up to M12x1: approx. 10 sec.

from M14x1.5 up: approx. 30 sec.

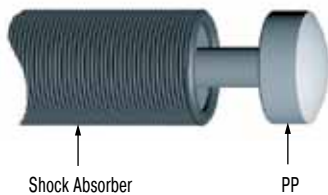
Note! The BV adaptor can only be installed onto a shock absorber without rod end button.

Part Number: MA, MC, SC...-880

(Models MC150EUM to MC600EUM and SC²190EUM5-7 are supplied as standard without buttons.)

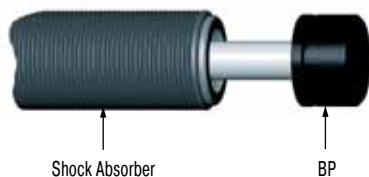
To remove button from existing absorber: Clamp shock absorber in mounting block and warm button carefully. Grip the button with pliers and pull off along rod axis.

PP Nylon Button



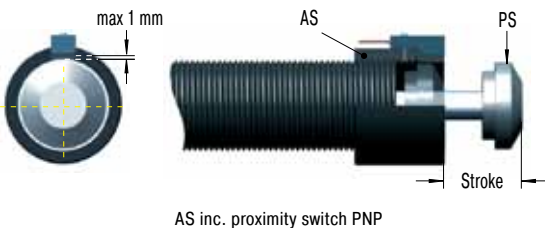
While the use of industrial shock absorbers already achieves a considerable reduction in noise levels, the additional use of PP impact buttons made of glass fibre reinforced nylon reduces noise levels even further, making it easy to fulfil the regulations of the new Noise Control Ordinance. At the same time, wear of impact surface is drastically minimized. The PP buttons are available for shock absorbers in series MC150EUM to MC600EUM. Model MA150EUM is supplied as standard with PP button. The buttons are fitted simply by pressing onto the piston rod.

BP Steel/Urethane Button



These new impact buttons made of urethane offer all above advantages of the PP nylon button in terms of reducing noise and wear. They fit easily onto the piston rod of the corresponding shock absorber. The head is then secured by a circlip integrated in the drilled hole of the steel base material. Please refer to the accessories table on pages 34 to 35 to see which shock absorber types the new BP buttons are available for.

PS / AS Steel Button, Switch Stop Collar



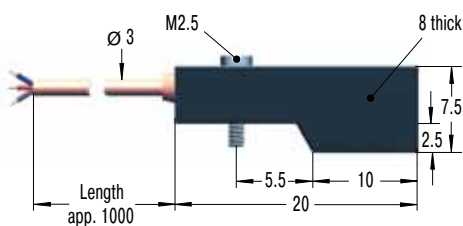
The ACE stop light switch stop collar combination can be mounted on all popular shock absorber models.

Features: Very short, compact mounting package.

The steel button type PS is fitted as standard on the models: SC190EUM0-4, SC300EUM0-9, SC650EUM0-9, SC925EUM0-4, MA/MVC225EUM, MA/MVC600EUM and MA/MVC900EUM. With all other models you must order the PS button as an optional accessory.

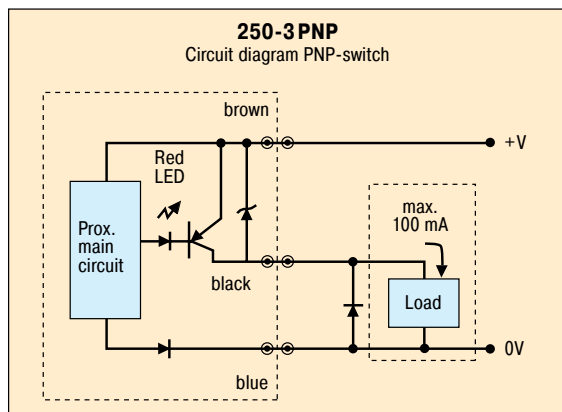
Mounting: We recommend to fix the steel button onto the end of the piston rod using Loctite 290. Attention! Take care not to leave any adhesive on the piston rod as this will cause seal damage. Thread the switch stop collar onto the front of the shock absorber and secure in position. Switch cable should not be routed close to power cables.

250-3 PNP Proximity Switch

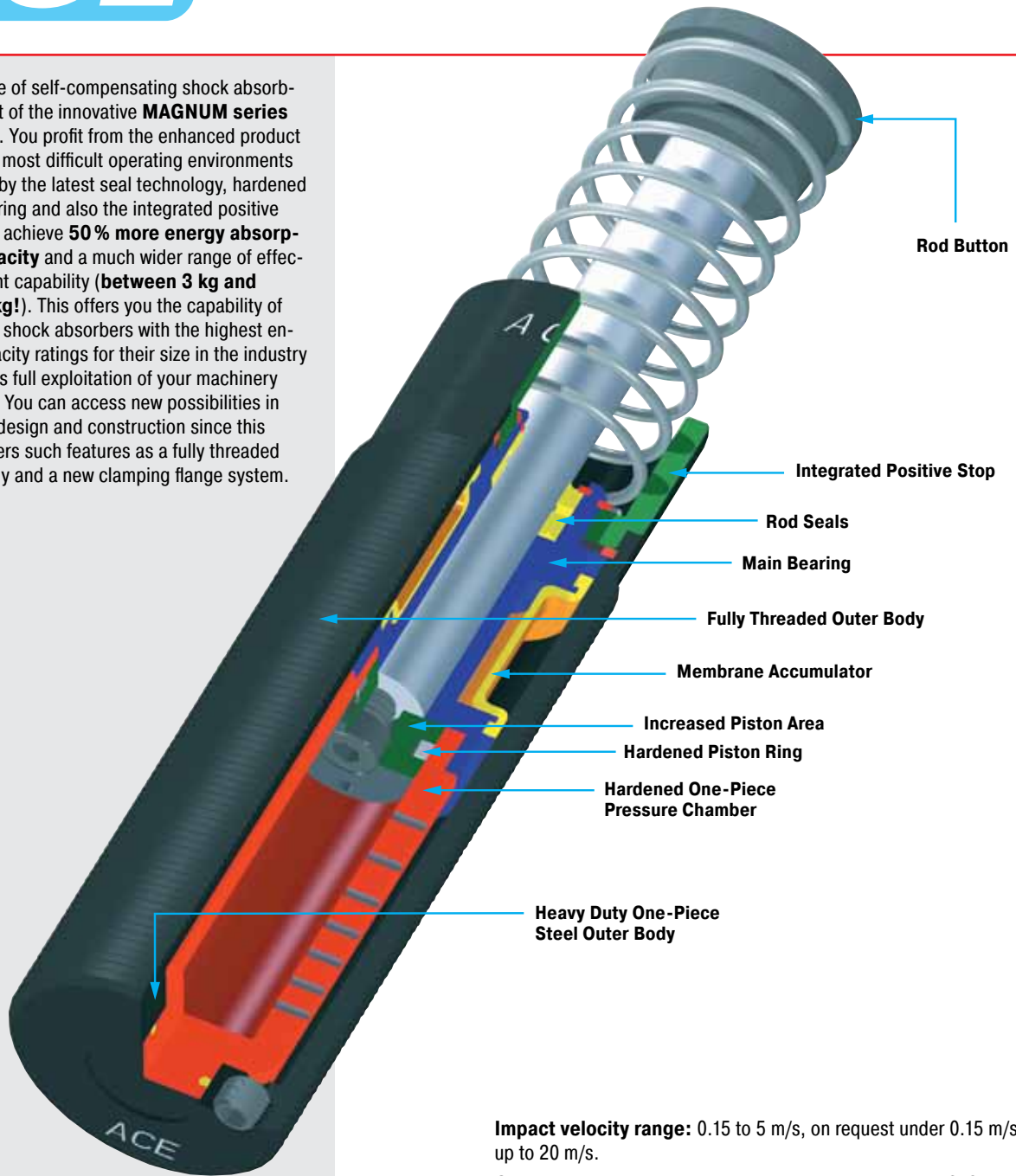


PNP proximity switch data:

- Supply voltage: 10-27 VDC
- Ripple < 10%
- Load current max.: 100 mA
- Operating temperature range: -10 °C to +60 °C
- Residual voltage: max. 1 V
- Protection: IP67 (IEC 144) with LED-indicator
- Proximity switch N/Open when shock absorber extended.
- When shock absorber is fully compressed switch closes and LED indicator lights.



This range of self-compensating shock absorbers is part of the innovative **MAGNUM series** from ACE. You profit from the enhanced product life in the most difficult operating environments provided by the latest seal technology, hardened main bearing and also the integrated positive stop. You achieve **50% more energy absorption capacity** and a much wider range of effective weight capability (**between 3 kg and 63 700 kg!**). This offers you the capability of mounting shock absorbers with the highest energy capacity ratings for their size in the industry and allows full exploitation of your machinery potential. You can access new possibilities in machine design and construction since this range offers such features as a fully threaded outer body and a new clamping flange system.



Impact velocity range: 0.15 to 5 m/s, on request under 0.15 m/s and up to 20 m/s.

Operating fluid: Automatic Transmission Fluid (ATF) at 42cSt.

Material: Shock absorber body: Nitride hardened steel. Accessories: Steel with black oxide finish or nitride hardened. Piston rod: Steel hardened and chrome plated. Rod end button: Hardened steel with black oxide finish. Return spring: Zinc plated or plastic-coated. For optimum heat dissipation do not paint shock absorber.

Capacity rating: For emergency use only applications it is sometimes possible to exceed the published max. capacity ratings. Please consult ACE for further details. If your application exceeds the tabulated W_4 figures (max. energy per hour Nm/hr) consider additional cooling. Ask ACE for further details.

Mounting: In any position

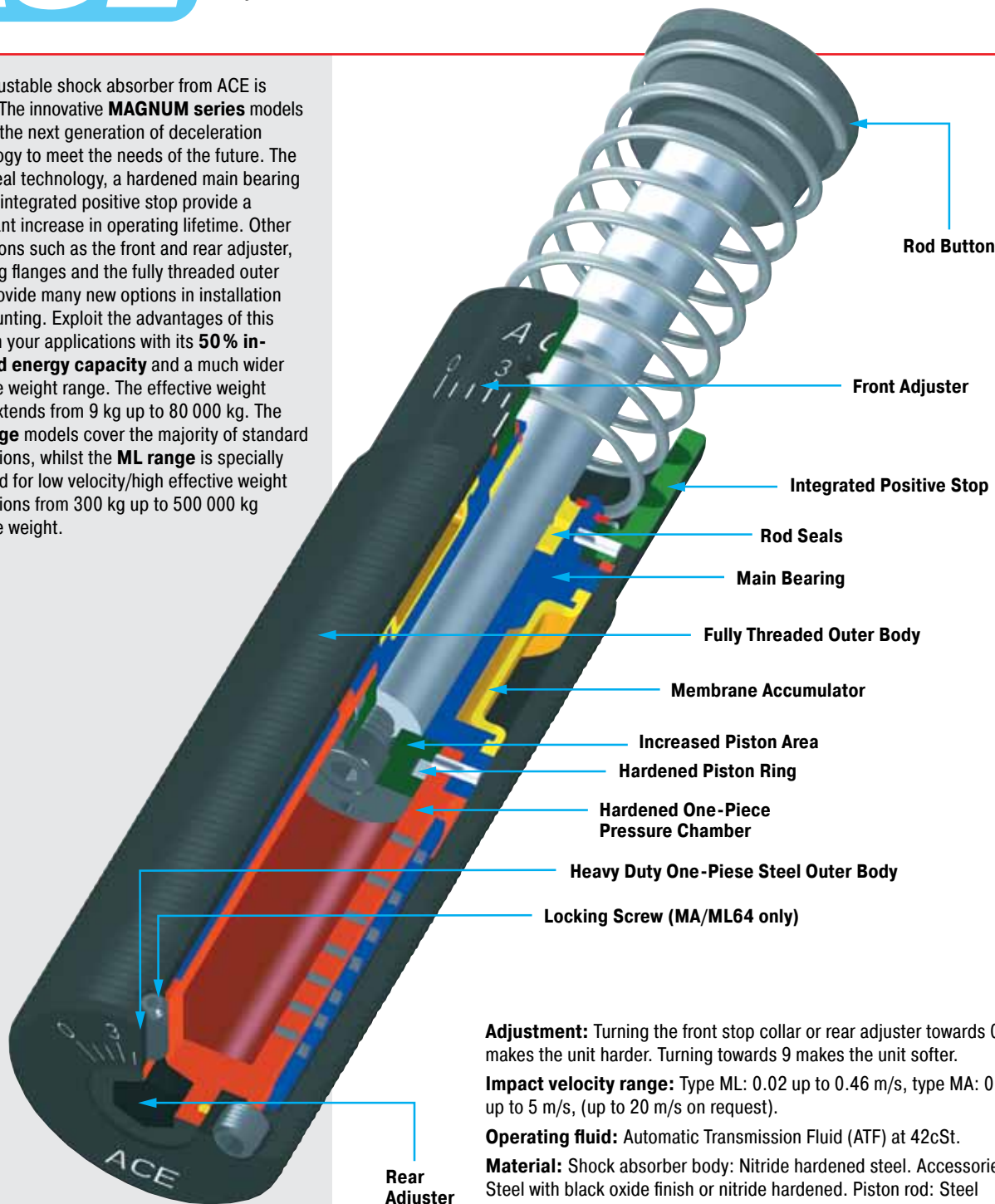
Operating temperature range: -12 °C to 70 °C. Higher temperatures see page 53.

On request: Plated finishes. Wearthec finish (seawater resistant), special oils. Mounting inside air cylinders and other special options are available on request.

Noise reduction: 3 to 7 dB when using the impact buttons with urethane insert.



This adjustable shock absorber from ACE is unique. The innovative **MAGNUM series** models provide the next generation of deceleration technology to meet the needs of the future. The latest seal technology, a hardened main bearing and the integrated positive stop provide a significant increase in operating lifetime. Other innovations such as the front and rear adjuster, clamping flanges and the fully threaded outer body provide many new options in installation and mounting. Exploit the advantages of this series in your applications with its **50% increased energy capacity** and a much wider effective weight range. The effective weight range extends from 9 kg up to 80 000 kg. The **MA range** models cover the majority of standard applications, whilst the **ML range** is specially designed for low velocity/high effective weight applications from 300 kg up to 500 000 kg effective weight.



Adjustment: Turning the front stop collar or rear adjuster towards 0 makes the unit harder. Turning towards 9 makes the unit softer.

Impact velocity range: Type ML: 0.02 up to 0.46 m/s, type MA: 0.15 up to 5 m/s, (up to 20 m/s on request).

Operating fluid: Automatic Transmission Fluid (ATF) at 42cSt.

Material: Shock absorber body: Nitride hardened steel. Accessories: Steel with black oxide finish or nitride hardened. Piston rod: Steel hardened and chrome plated. Rod end button: Hardened steel with black oxide finish. Return spring: Zinc plated or plastic-coated. For optimum heat dissipation do not paint shock absorber.

Capacity rating: For emergency use only applications it is sometimes possible to exceed the published max. capacity ratings. Please consult ACE for further details. If your application exceeds the tabulated W_4 figures (max. energy per hour Nm/hr) consider additional cooling. Ask ACE for further details.

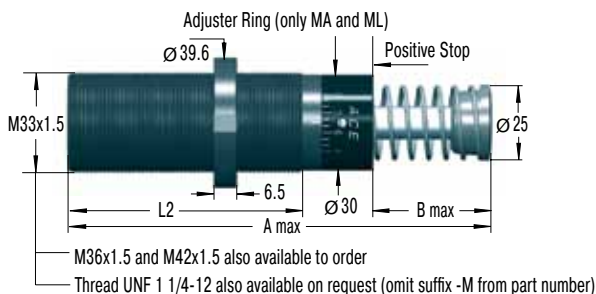
Mounting: In any position

Operating temperature range: -12 °C to 70 °C. Higher temperatures see page 53.

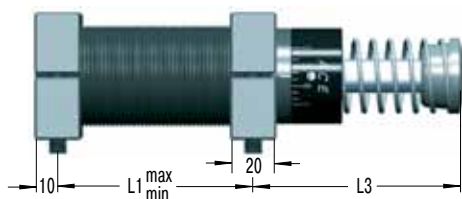
On request: Plated finishes. Wearthec finish (seawater resistant), special oils. Mounting inside air cylinders and other special options are available on request.

Noise reduction: 3 to 7 dB when using the impact buttons with urethane insert.





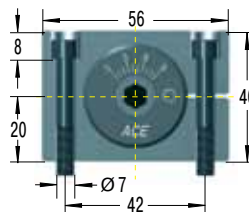
S33



Side Foot Mounting Kit

S33 = 2 flanges + 4 screws M6x40, DIN 912

Because of the thread pitch the fixing holes for the second foot mount should only be drilled and tapped after the first foot mount has been fixed in position.



Tightening torque: 11 Nm
Clamping torque: > 90 Nm

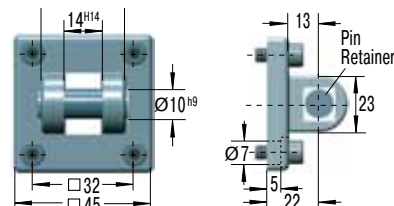
C33



Clevis Mounting Kit

C33 = 2 clevis eyes. Delivered assembled to shock absorber. Use positive stop at both ends of travel.

SF33



Clevis Flange

SF33 = flange + 4 screws M6x20, DIN 912

Tightening torque: 7.5 Nm

Clamping torque > 50 Nm

Secure with pin or use additional bar. Due to limited force capacity the respective ability should be reviewed by ACE.

Dimensions

Type	¹ Stroke mm	A max	B max	L1 min	L1 max	L2	L3	L5 max	L6 max
MC, MA, ML3325EUM	25	138	23	25	60	83	68	39	168
MC, MA, ML3350EUM	50	189	48.5	32	86	108	93	64	218

¹ Nominal stroke length (without integral stop collar fitted).

Capacity Chart MC33

Type	Max. Energy Capacity				¹ Effective Weight me					Min. Return Force N	Max. Return Force N	Rod Reset Time s	Max. Side Load Angle °	Weight kg
	² W ₃ Nm/Cycle	W ₄ Self-Contained Nm/h	W ₄ with Air/Oil Tank Nm/h	W ₄ with Oil Recirculation Nm/h	Soft		Hard							
					min. kg	max. kg	-0 min. kg	-1 min. kg	-2 min. kg					
MC3325EUM	155	75 000	124 000	169 000	3 - 11	9 - 40	30 - 120	100 - 420	350 - 1 420	45	90	0.03	4	0.45
MC3350EUM	310	85 000	135 000	180 000	5 - 22	18 - 70	60 - 250	210 - 840	710 - 2 830	45	135	0.06	3	0.54

Capacity Chart MA/ML33

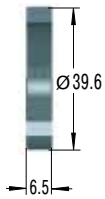
Type	Max. Energy Capacity				¹ Effective Weight me		Min. Return Force N	Max. Return Force N	Rod Reset Time s	Max. Side Load Angle °	Weight kg
	² W ₃ Nm/Cycle	W ₄ Self-Contained Nm/h	W ₄ with Air/Oil Tank Nm/h	W ₄ with Oil Recirculation Nm/h	min.	max.					
					kg						
MA3325EUM	170	75 000	124 000	169 000	9	1 700	45	90	0.03	4	0.45
ML3325EUM	170	75 000	124 000	169 000	300	50 000	45	90	0.03	4	0.45
MA3350EUM	340	85 000	135 000	180 000	13	2 500	45	135	0.06	3	0.54
ML3350EUM	340	85 000	135 000	180 000	500	80 000	45	135	0.06	3	0.66

¹ The effective weight range limits can be raised or lowered to special order.

² For emergency use only applications it is sometimes possible to exceed the above ratings. Please consult ACE for further details. Specifications relate to the effective stroke length (B max).

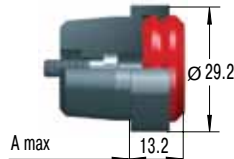
M33x1.5

NM33



Locking Ring

PP33

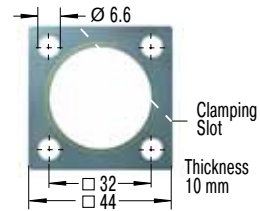


see shock absorber dims.

Poly Button

Optional button with elastomer insert for noise suppression. Option supplied ready mounted onto the shock absorber. For self installation see mounting instructions on page 55.

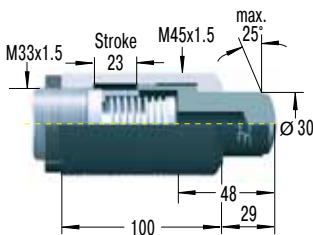
QF33



Square Flange

Install with 4 machine screws
Tightening torque: 11 Nm
Clamping torque: > 90 Nm

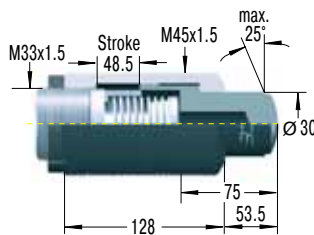
BV3325



Side Load Adaptor

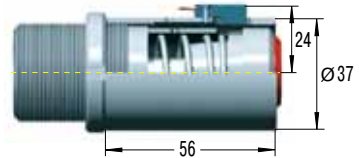
Mounting, installation etc. see pages 40 to 41 and 52.

BV3350



Side Load Adaptor

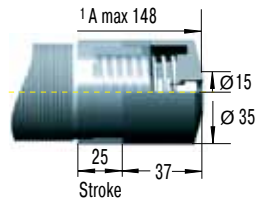
AS33



Switch Stop Collar

inc. Proximity Switch and Poly Button with elastomer insert

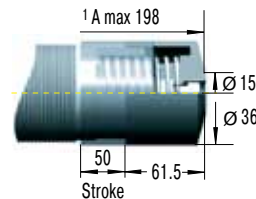
PB3325



Steel Shroud

Mounting, installation etc. see page 52.

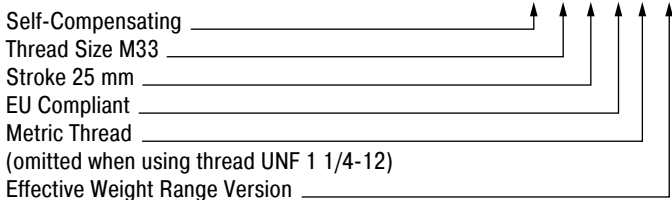
PB3350



Steel Shroud

¹ Total installation length of the shock absorber inc. steel shroud

Ordering Example



Model Type Prefix

Standard Models

Self-Contained with Return Spring

- MC Self-Compensating
- MA Adjustable
- ML Adjustable, for lower impact velocity

Special Models

Air/Oil Return without Return Spring

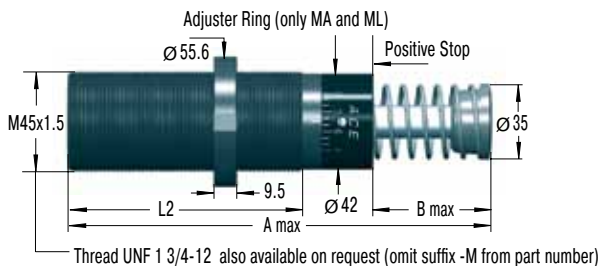
MCA, MAA, MLA

Air/Oil Return with Return Spring

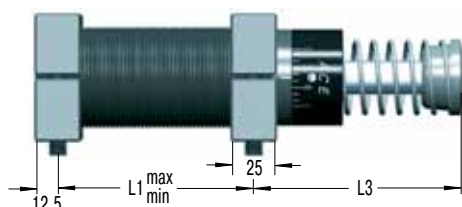
MCS, MAS, MLS

Self-Contained without Return Spring

MCN, MAN, MLN



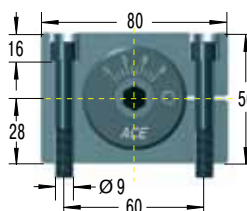
S45



Side Foot Mounting Kit

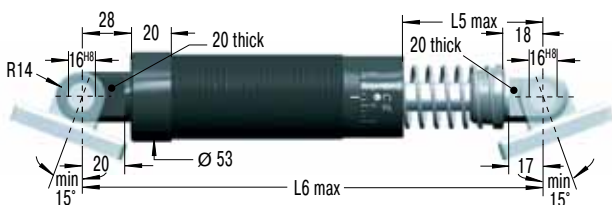
S45 = 2 flanges + 4 screws M8x50, DIN 912

Because of the thread pitch the fixing holes for the second foot mount should only be drilled and tapped after the first foot mount has been fixed in position.



Tightening torque: 27 Nm
 Clamping torque: > 350 Nm

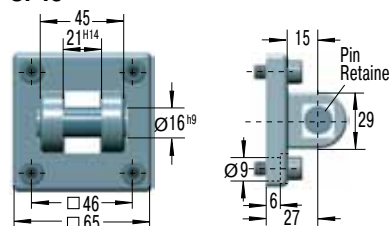
C45



Clevis Mounting Kit

C45 = 2 clevis eyes. Delivered assembled to shock absorber. Use positive stop at both ends of travel.

SF45



Clevis Flange

SF45 = flange + 4 screws M8x20, DIN 912

Tightening torque: 7.5 Nm
 Clamping torque: > 140 Nm

Secure with pin or use additional bar.
Due to limited force capacity the respective ability should be reviewed by ACE.

Dimensions

Type	¹ Stroke mm	A max	B max	L1 min	L1 max	L2	L3	L5 max	L6 max
MC, MA, ML4525EUM	25	145	23	32	66	95	66	43	200
MC, MA, ML4550EUM	50	195	48.5	40	92	120	91	68	250
MC, MA4575EUM	75	246	74	50	118	145	116	93	301

¹ Nominal stroke length (without integral stop collar fitted).

Capacity Chart MC45

Type Self-Compensating	Max. Energy Capacity				¹ Effective Weight me					Min. Return Force N	Max. Return Force N	Rod Reset Time s	Max. Side Load Angle °	Weight kg
	² W ₃ Nm/Cycle	W ₄ Self-Contained Nm/h	W ₄ with Air/Oil Tank Nm/h	W ₄ with Oil Recirculation Nm/h	Soft		Hard							
					-0 min. max. kg	-1 min. max. kg	-2 min. max. kg	-3 min. max. kg	-4 min. max. kg					
MC4525EUM	340	107 000	158 000	192 000	7 - 27	20 - 90	80 - 310	260 - 1 050	890 - 3 540	70	100	0.03	4	1.13
MC4550EUM	680	112 000	192 000	248 000	13 - 54	45 - 180	150 - 620	520 - 2 090	1 800 - 7 100	70	145	0.08	3	1.36
MC4575EUM	1020	146 000	22 5000	282 000	20 - 80	70 - 270	230 - 930	790 - 3 140	2 650 - 10 600	50	180	0.11	2	1.59

Capacity Chart MA/ML45

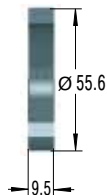
Type Adjustable	Max. Energy Capacity				¹ Effective Weight me		Min. Return Force N	Max. Return Force N	Rod Reset Time s	Max. Side Load Angle °	Weight kg
	² W ₃ Nm/Cycle	W ₄ Self-Contained Nm/h	W ₄ with Air/Oil Tank Nm/h	W ₄ with Oil Recirculation Nm/h	min. kg	max. kg					
MA4525EUM	390	107 000	158 000	192 000	40	- 10 000	70	100	0.03	4	1.14
ML4525EUM	390	107 000	158 000	192 000	3 000	- 110 000	70	100	0.03	4	1.13
MA4550EUM	780	112 000	192 000	248 000	70	- 14 500	70	145	0.08	3	1.36
ML4550EUM	780	112 000	192 000	248 000	5 000	- 180 000	70	145	0.08	3	1.36
MA4575EUM	1 170	146 000	225 000	282 000	70	- 15 000	50	180	0.11	2	1.59

¹ The effective weight range limits can be raised or lowered to special order.

² For emergency use only applications it is sometimes possible to exceed the above ratings. Please consult ACE for further details. Specifications relate to the effective stroke length (B max).

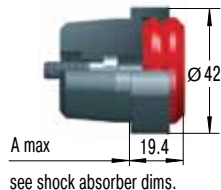
M45x1.5

NM45



Locking Ring

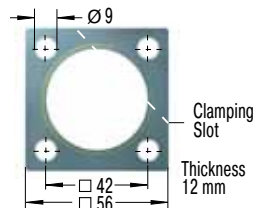
PP45



Poly Button

Optional button with elastomer insert for noise suppression. Option supplied ready mounted onto the shock absorber. For self installation see mounting instructions on page 55.

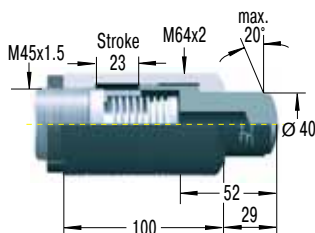
QF45



Square Flange

Install with 4 machine screws
Tightening torque: 27 Nm
Clamping torque: > 200 Nm

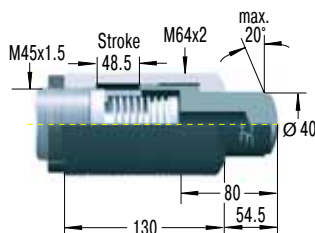
BV4525



Side Load Adaptor

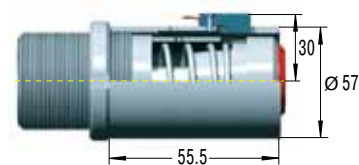
Mounting, installation etc. see pages 40 to 41 and 52.

BV4550



Side Load Adaptor

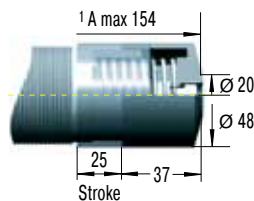
AS45



Switch Stop Collar

inc. Proximity Switch and Poly Button with elastomer insert

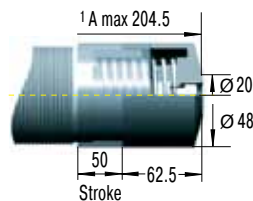
PB4525



Steel Shroud

Mounting, installation etc. see page 52.

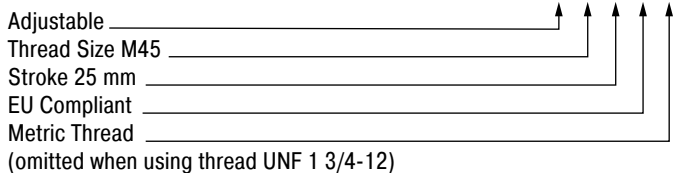
PB4550



Steel Shroud

¹ Total installation length of the shock absorber inc. steel shroud

Ordering Example



Model Type Prefix

Standard Models

Self-Contained with Return Spring

- MC Self-Compensating
- MA Adjustable
- ML Adjustable, for lower impact velocity

Special Models

Air/Oil Return without Return Spring

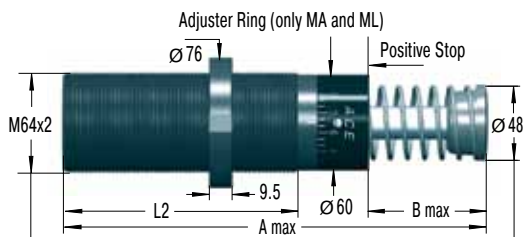
MCA, MAA, MLA

Air/Oil Return with Return Spring

MCS, MAS, MLS

Self-Contained without Return Spring

MCN, MAN, MLN

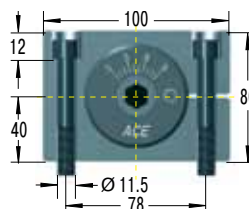
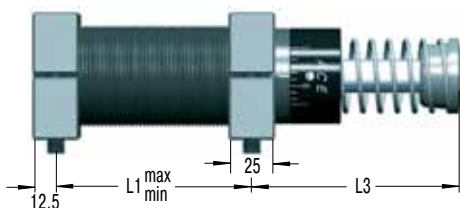


Adjuster (only MA and ML)

Thread UNF 2 1/2-12 also available on request (omit suffix -M from part number)

Note: 150 mm stroke model does not include stop collar and positive stop is provided by the rod button (Ø 60 mm)

S64



Side Foot Mounting Kit

S64 = 2 flanges + 4 screws M10x80, DIN 912

Because of the thread pitch the fixing holes for the second foot mount should only be drilled and tapped after the first foot mount has been fixed in position.

Tightening torque: 50 Nm
Clamping torque: > 350 Nm

C64



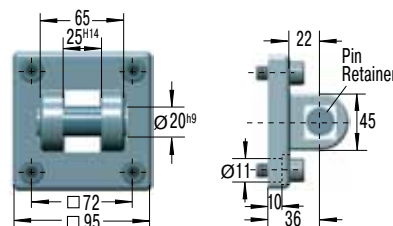
Clevis Mounting Kit

C64 = 2 clevis eyes. Delivered assembled to shock absorber.

¹ with 150 mm stroke Dia. 60 mm. Order C64/150.

Use positive stop at both ends of travel.

SF64



Clevis Flange

SF64 = flange + 4 screws M10x20, DIN 912

Tightening torque: 15 Nm
Clamping torque: > 200 Nm

Secure with pin or use additional bar. Due to limited force capacity the respective ability should be reviewed by ACE.

Dimensions

Type	¹ Stroke mm	A max	B max	L1 min	L1 max	L2	L3	L5 max	L6 max
ML6425EUM	25	174	23	40	86	114	75.5	60	260
MC, MA, ML6450EUM	50	225	48.5	50	112	140	100	85	310
MC, MA64100EUM	100	326	99.5	64	162	191	152	136	410
MC, MA64150EUM	150	450	150	80	212	241	226	187	530

¹ Nominal stroke length (without integral stop collar fitted).

Capacity Chart MC64

Type Self-Compensating	Max. Energy Capacity				¹ Effective Weight me					Min. Return Force N	Max. Return Force N	Rod Reset Time s	Max. Side Load Angle °	Weight kg
	² W ₃ Nm/Cycle	W ₄ Self-Contained Nm/h	W ₄ with Air/Oil Tank Nm/h	W ₄ with Oil Recirculation Nm/h	Soft			Hard						
					-0 min. max. kg	-1 min. max. kg	-2 min. max. kg	-3 min. max. kg	-4 min. max. kg					
MC6450EUM	1 700	146 000	293 000	384 000	35 - 140	140 - 540	460 - 1 850	1 600 - 6 300	5 300 - 21 200	90	155	0.12	4	2.9
MC64100EUM	3 400	192 000	384 000	497 000	70 - 280	270 - 1 100	930 - 3 700	3 150 - 12 600	10 600 - 42 500	105	270	0.34	3	3.7
MC64150EUM	5 100	248 000	497 000	644 000	100 - 460	410 - 1 640	1 390 - 5 600	4 700 - 18 800	16 000 - 63 700	75	365	0.48	2	5.1

Capacity Chart MA/ML64

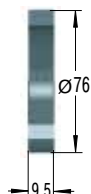
Type Adjustable	Max. Energy Capacity				¹ Effective Weight me		Min. Return Force N	Max. Return Force N	Rod Reset Time s	Max. Side Load Angle °	Weight kg
	² W ₃ Nm/Cycle	W ₄ Self-Contained Nm/h	W ₄ with Air/Oil Tank Nm/h	W ₄ with Oil Recirculation Nm/h	min.	max.					
ML6425EUM	1 020	124 000	248 000	332 000	7 000	- 300 000	120	155	0.06	5	2.5
MA6450EUM	2 040	146 000	293 000	384 000	220	- 50 000	90	155	0.12	4	2.9
ML6450EUM	2 040	146 000	293 000	384 000	11 000	- 500 000	90	155	0.12	4	2.9
MA64100EUM	4 080	192 000	384 000	497 000	270	- 52 000	105	270	0.34	3	3.7
MA64150EUM	6 120	248 000	497 000	644 000	330	- 80 000	75	365	0.48	2	5.1

¹ The effective weight range limits can be raised or lowered to special order.

² For emergency use only applications it is sometimes possible to exceed the above ratings. Please consult ACE for further details. Specifications relate to the effective stroke length (B max).

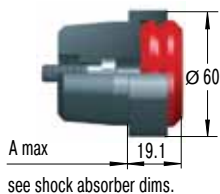
M64x2

NM64



Locking Ring

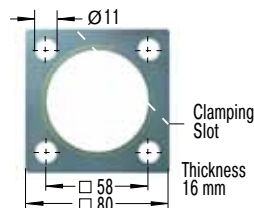
PP64



Poly Button

Optional button with elastomer insert for noise suppression. Option supplied ready mounted onto the shock absorber. For self installation see mounting instructions on page 55.

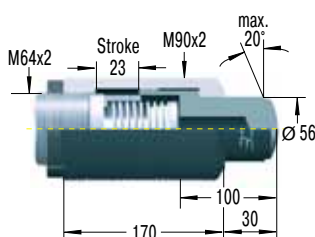
QF64



Square Flange

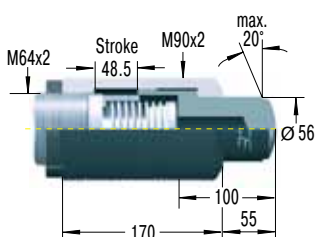
Install with 4 machine screws
Tightening torque: 50 Nm
Clamping torque: > 210 Nm

BV6425



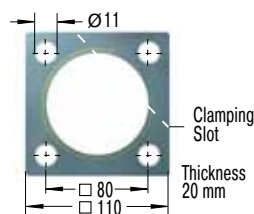
Side Load Adaptor

BV6450



Side Load Adaptor

QF90

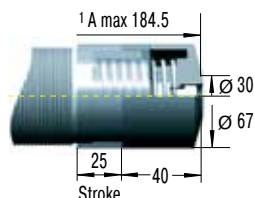


Square Flange

Install with 4 machine screws
Tightening torque: 50 Nm
Clamping torque: > 210 Nm

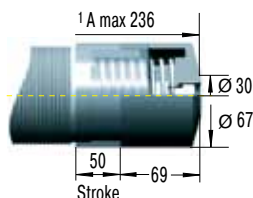
Mounting, installation etc. see pages 40 and 52.

PB6425



Steel Shroud

PB6450

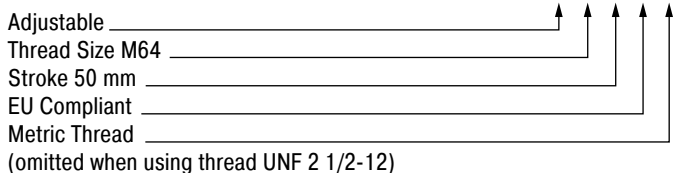


Steel Shroud

¹ Total installation length of the shock absorber inc. steel shroud

Mounting, installation etc. see page 52.

Ordering Example



MA6450EUM

Model Type Prefix

Standard Models

Self-Contained with Return Spring

- MC Self-Compensating
- MA Adjustable
- ML Adjustable, for lower impact velocity

Special Models

Air/Oil Return without Return Spring

MCA, MAA, MLA

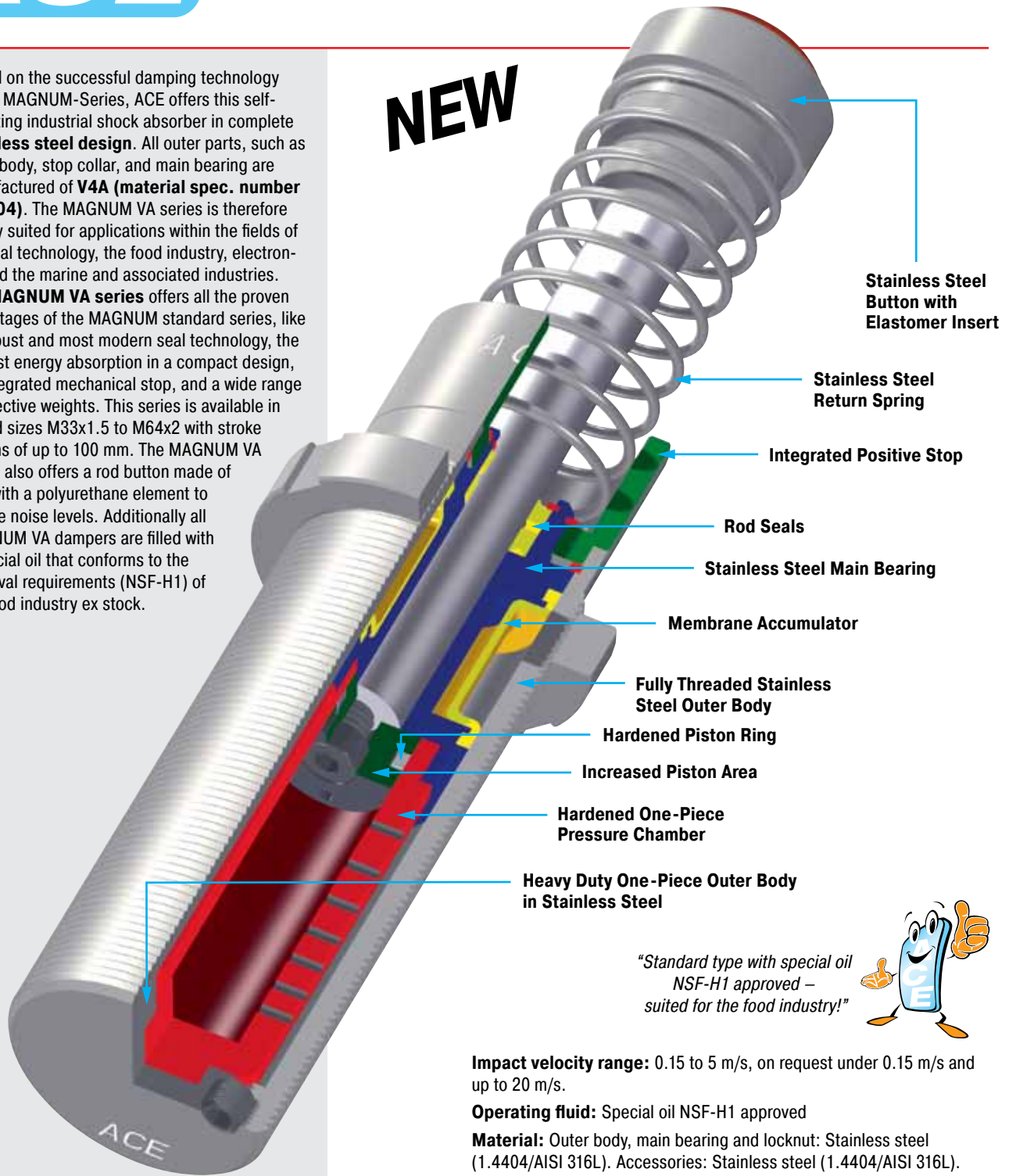
Air/Oil Return with Return Spring

MCS, MAS, MLS

Self-Contained without Return Spring

MCN, MAN, MLN

Based on the successful damping technology of our MAGNUM-Series, ACE offers this self-adjusting industrial shock absorber in complete **stainless steel design**. All outer parts, such as outer body, stop collar, and main bearing are manufactured of **V4A (material spec. number 1.4404)**. The MAGNUM VA series is therefore ideally suited for applications within the fields of medical technology, the food industry, electronics and the marine and associated industries. The **MAGNUM VA series** offers all the proven advantages of the MAGNUM standard series, like its robust and most modern seal technology, the highest energy absorption in a compact design, an integrated mechanical stop, and a wide range of effective weights. This series is available in thread sizes M33x1.5 to M64x2 with stroke lengths of up to 100 mm. The MAGNUM VA series also offers a rod button made of V4A with a polyurethane element to reduce noise levels. Additionally all MAGNUM VA dampers are filled with a special oil that conforms to the approval requirements (NSF-H1) of the food industry ex stock.



Impact velocity range: 0.15 to 5 m/s, on request under 0.15 m/s and up to 20 m/s.

Operating fluid: Special oil NSF-H1 approved

Material: Outer body, main bearing and locknut: Stainless steel (1.4404/AISI 316L). Accessories: Stainless steel (1.4404/AISI 316L). Piston rod: hardened and chrome plated high tensile steel. Button: Stainless steel (1.4404/AISI 316L) with elastomer insert. Return spring: Stainless steel.

Capacity rating: For emergency only applications it is sometimes possible to exceed the published max. capacity ratings. Please consult ACE for further details. If your application exceeds the tabulated W_4 figures (max. energy per hour Nm/hr) consider additional cooling. Ask ACE for further details.

Mounting: In any position

Operating temperature range: -12°C to 70°C. For higher temperatures consult ACE.

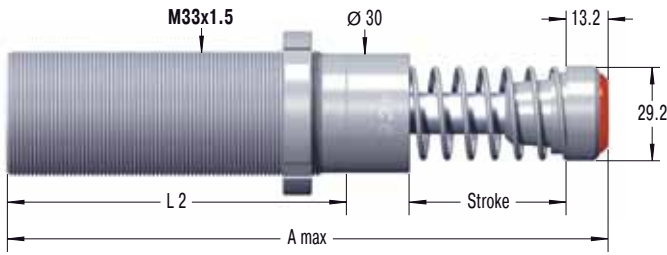
On request: special oils, viton seals and special accessories

Noise reduction: 3 to 7 dB when using the impact buttons with urethane insert.

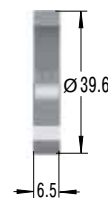


NEW

MC33xxEUM-V4A

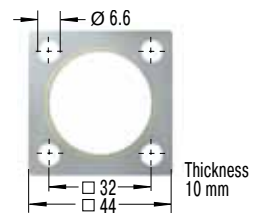


NM33-V4A



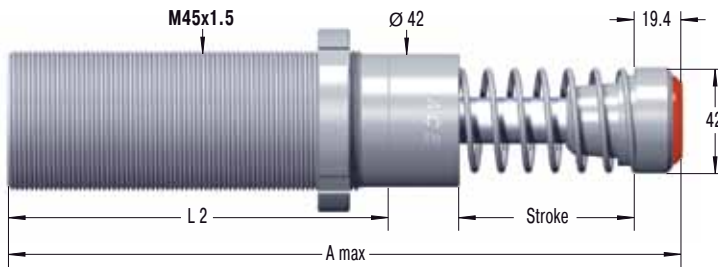
Locking Ring

QF33-V4A

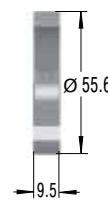


Square Flange

MC45xxEUM-V4A

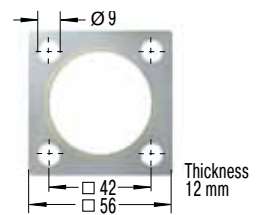


NM45-V4A



Locking Ring

QF45-V4A

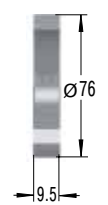


Square Flange

MC64xxEUM-V4A

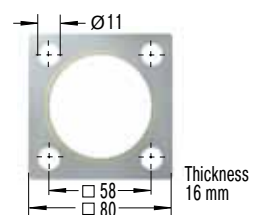


NM64-V4A



Locking Ring

QF64-V4A



Square Flange

Dimensions

Type	Stroke mm	A max	L2
MC3325EUM-V4A	23	151.2	83
MC3350EUM-V4A	48.5	202.2	108
MC4525EUM-V4A	23	164.5	95
MC4550EUM-V4A	48.5	214.4	120
MC4575EUM-V4A	74	265.4	145
MC6450EUM-V4A	48.5	244.1	140
MC64100EUM-V4A	99.5	345.1	191

Ordering Example

Self-Compensating MC4550EUM-1-V4A
 Thread Size M45
 Stroke 50 mm
 EU Compliant
 Metric Thread
 Effective Weight Range Version
 Stainless Steel 1.4404/AISI 316L

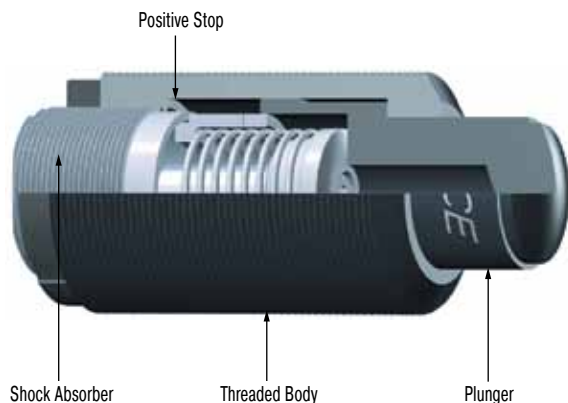
Capacity Chart MC33/MC45/MC64

Type	Max. Energy Capacity		1 Effective Weight me					Min. Return Force N	Max. Return Force N	Rod Reset Time s	Max. Side Load Angle °	Weight kg
	2 W ₃ Nm/Cycle	W ₄ Nm/h	Soft			Hard						
			-0 min. max. kg	-1 min. max. kg	-2 min. max. kg	-3 min. max. kg	-4 min. max. kg					
MC3325EUM-V4A	155	75 000	3 - 11	9 - 40	30 - 120	100 - 420	350 - 1 420	45	90	0.03	4	0.45
MC3350EUM-V4A	310	85 000	5 - 22	18 - 70	60 - 250	240 - 840	710 - 2 830	45	135	0.06	3	0.54
MC4525EUM-V4A	340	107 000	7 - 27	20 - 90	80 - 310	260 - 1 050	890 - 3 540	70	100	0.03	4	1.13
MC4550EUM-V4A	680	112 000	13 - 54	45 - 180	150 - 620	520 - 2 090	1 800 - 7 100	70	145	0.08	3	1.36
MC4575EUM-V4A	1 020	146 000	20 - 80	70 - 270	230 - 930	790 - 3 140	2 650 - 10 600	50	180	0.11	2	1.59
MC6450EUM-V4A	1 700	146 000	35 - 140	140 - 540	460 - 1 850	1 600 - 6 300	5 300 - 21 200	90	155	0.12	4	2.9
MC64100EUM-V4A	3 400	192 000	70 - 280	270 - 1 100	930 - 3 700	3 150 - 12 600	10 600 - 42 500	105	270	0.34	3	3.7

¹ The effective weight range limits can be raised or lowered to special order.

² For emergency only applications it is sometimes possible to exceed the above ratings. Please consult ACE for further details.

BV Side Load Adaptor



For side load impact angles from 3° to 25°

With side load impact angles of more than 3° the operation lifetime of the shock absorber reduces rapidly due to increased wear of rod bearings. The optional BV side load adaptor provides long lasting solution.

BV3325 (M45x1.5) for MC, MA, ML3325EUM (M33x1.5)

BV3350 (M45x1.5) for MC, MA, ML3350EUM (M33x1.5)

BV4525 (M64x2) for MC, MA, ML4525EUM (M45x1.5)

BV4550 (M64x2) for MC, MA, ML4550EUM (M45x1.5)

BV6425 (M90x2) for ML6425EUM (M64x2)

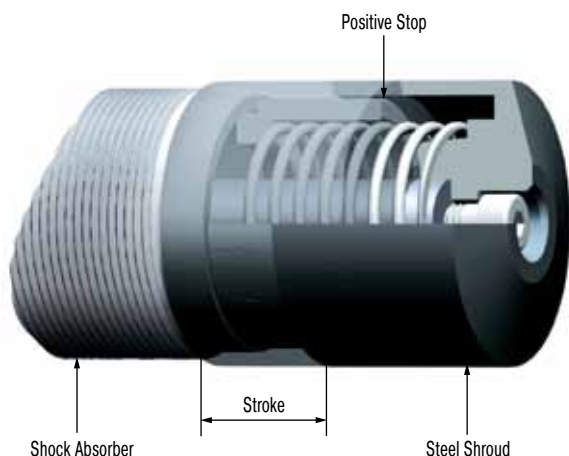
BV6450 (M90x2) for MC, MA, ML6450EUM (M64x2)

Material: Threaded body and plunger: Hardened high tensile steel. Hardened 610 HV1.

Mounting: Directly mount the shock absorber/side mount assembly on the outside thread of the side load adaptor or by using the QF flange. You cannot use a foot mount.

Calculation example and installation hints see page 40.

PB Steel Shroud



For thread sizes M33x1.5, M45x1.5 and M64x2 with 25 or 50 mm stroke

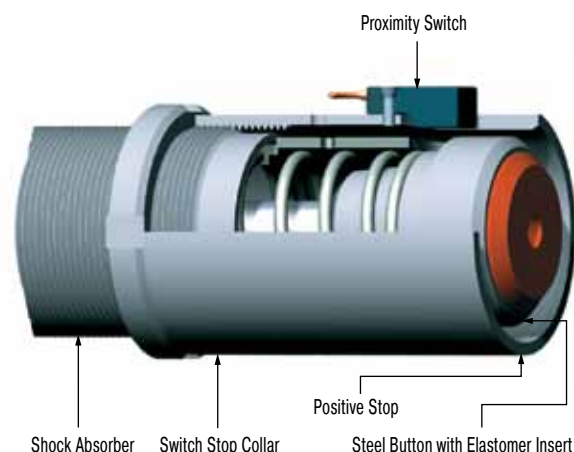
Grinding beads, sand, welding splatter, paints and adhesives etc. can adhere to the piston rod. They then damage the rod seals and the shock absorber quickly fails. In many cases the installation of the optional steel shroud can provide worthwhile protection and increase lifetime.

Material: Hardened high tensile steel.

Mounting: To mount the PB steel shroud it is necessary to remove the rod end button of the shock absorber.

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

AS Switch Stop Collar

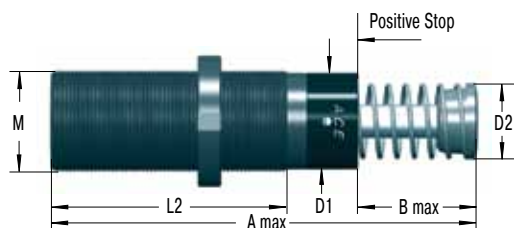


For thread sizes M33x1.5 and M45x1.5

The ACE stop light switch stop collar combination serves as a safety element to provide stroke position information for automatically sequenced machines. The compact construction allows its use in nearly any application. The standard rod button is detected by the proximity switch at the end of its stroke to provide switch actuation. The switch is normally open when the shock absorber is extended and only closes when it has completed its operating stroke. The AS switch stop collar combination is only delivered ready mounted onto the shock absorber c/w the switch.

Material: Hardened high tensile steel.

For circuit diagram of proximity switch see page 41.



Dimensions and Capacity Chart

Type Part Number	1 Stroke mm	A max	B	D1	D2	L2	2 M	Max. Energy Capacity			Max. Side Load Angle °	Weight kg
								per Cycle W ₃ max. Nm	per Hour			
									at 20 °C W ₄ max. Nm	at 100 °C W ₄ max. Nm		
MC3325EUM	25	138	23.0	30	25	83	M33x1.5	155	215 000	82 000	4	0.45
MC3350EUM	50	189	48.5	30	25	108	M33x1.5	310	244 000	93 000	3	0.54
MC4525EUM	25	145	23.0	42	35	95	M45x1.5	340	307 000	117 000	4	1.13
MC4550EUM	50	195	48.5	42	35	120	M45x1.5	680	321 000	122 000	3	1.36
MC6450EUM	50	225	48.5	60	48	140	M64x2	1 700	419 000	159 000	4	2.90
MC64100EUM	100	326	99.5	60	48	191	M64x2	3 400	550 000	200 000	3	3.70

¹ Nominal stroke length (without stop collar fitted).

² UNF threads available on request.

The calculation and selection of the most suitable shock absorber (effective weight range) for your application should be carried out or checked by ACE Controls. Adjustable models are also available on request.

Ordering Example

Self-Compensating _____ ↑
 Thread Size M33 _____ ↑
 Stroke 50 mm _____ ↑
 EU Compliant _____ ↑
 Metric Thread (omitted when using thread UNF) _____ ↑
 Effective Weight Range Code _____ ↑
 Version for High Temperature Use _____ ↑

MC3350EUM-2-HT

Details Required when Ordering

Load to be decelerated _____ m (kg)
 Impact velocity _____ v (m/s)
 Propelling force _____ F (N)
 Operating cycles per hour _____ x (/hr)
 Number of absorbers in parallel _____ n
 Ambient temperature _____ °C

Technical Data

Impact velocity range: 0.15 to 5 m/s, up to 20 m/s on request.

Operating fluid: Special temperature stable synthetic oil

Material: Shock absorber body: Nitride hardened steel. Accessories: Steel with black oxide finish or nitride hardened. Piston rod: Steel hardened and chrome plated. Rod end button: Hardened steel with black oxide finish. Return spring: Zinc plated or plastic-coated. For optimum heat dissipation do not paint shock absorber.

Mounting: In any position

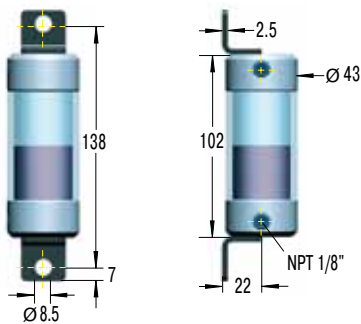
Operating temperature range: -20 °C to 150 °C

Capacity rating: For emergency applications it is sometimes possible to exceed above max. capacity ratings (please consult ACE for details). The above W₄ ratings (max. energy Nm per hour) can sometimes be increased by using an external air/oil tank (see page 54) and model version prefix **MCA** (please consult ACE for further details).

On request: Plated finishes for additional corrosion protection.



A01



Oil capacity 20 cm³
Material: Alu. caps and polycarbonate body.

1 A03



Oil capacity 370 cm³
Material: Steel

1 A0691



Oil capacity 2600 cm³
Material: Steel

¹ Detail drawings on request

Max. pressure 8 bar. Max. temperature 80 °C.

Oil filling: ATF-Oil 42 cSt at 40 °C for all shock absorbers in MAGNUM Series. Mount air/oil tank higher than shock absorber. Bleed all air from system before operating.

Attention: Exhaust tank before carrying out service. Check valve holds pressure!

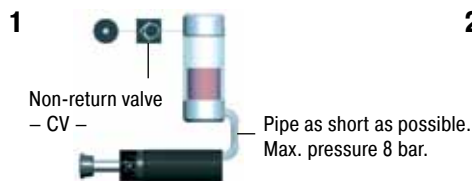
Suggested air/oil tanks in accordance with W₄ ratings

Part Numbers

Type	With Tank Examples 1-4		With Recirc. Circuits Ex. 5-6		Conn. Pipe. Ø Min.
	Tank	Non-Return Valve	Tank	Non-Return Valve	
MCA, MAA, MLA33...	AO1	CV1/8	A03	CV1/4	4
MCA, MAA, MLA45...	AO1	CV1/8	A03	CV3/8	6
MCA, MAA, MLA64...	AO3	CV1/4	A0691	CV1/2	8
CAA, AA2...	A0691	CV1/2	A082	CV3/4	15
CAA, AA3...	A0691	CV1/2	A082	CV3/4	19
CAA4...	A082	CV3/4	A082	CV3/4	38

A082 details on request

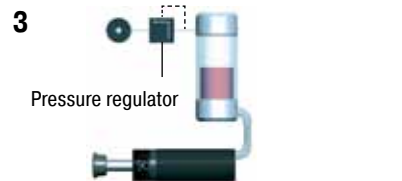
Connection Examples Air/Oil Tanks



Piston rod returns immediately to extended position when load moves away. Operation without main air supply possible for short periods.



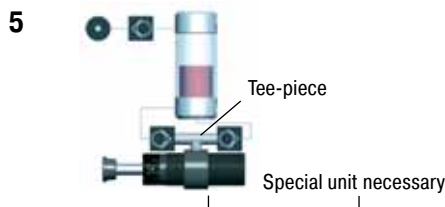
Return stroke may be sequenced by pneumatic valve at any desired time. No return force until valve energised.



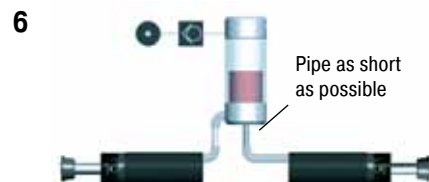
Return force can be adjusted by pressure regulator. Ensure safe minimum pressure to return shock absorber.



Spring return with air/oil tank. No air supply connected. Note: Will extend return time.



Oil recirculation circuit for extreme high cycle rates. Warm oil is positively circulated through air/oil tank for increased heat dissipation.



Connection of two shock absorbers to one air/oil tank is possible. Use next larger size tank. Combination with examples 2, 3 and 5 possible.

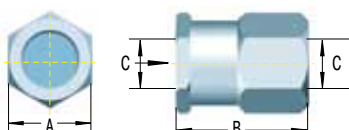
Thread Sizes for connection to air/oil tank

Type	Thread Bottom	² Thread Side
MCA, MAA, MLA33	¹ G1/8 inside	G1/8 inside
MCA, MAA, MLA45	G1/8 inside	G1/8 inside
MCA, MAA, MLA64	G1/4 inside	G1/4 inside

¹ adapted
² on request (add suffix -PG/-P)

Part Numbers: CV...

Max. pressure: 20 bar
Max. temperature: 95 °C
Suitable for: Oil, air, water.
Material: Aluminium



Non-Return Valves

Type	A	B	C
CV1/8	19	24	1/8-27 NPT
CV1/4	29	33	1/4-18 NPT
CV3/8	29	33	3/8-18 NPT
CV1/2	41	40	1/2-14 NPT
CV3/4	48	59	3/4-14 NPT

Mechanical Stop

The MAGNUM series units have a built in stop collar (mechanical stop) which also serves as the front adjuster.

If using a shock absorber without a stop collar it is important to install a mechanical stop 0.5 to 1mm before the end of the stroke.



General

For optimum heat dissipation do not paint the shock absorber. For applications in environments with acids, dusts or powders, abrasives, steam or water please protect the shock absorber and/or consider the special accessories on page 52. The shock absorber should be securely mounted onto a flat and smooth surface of adequate strength.

Self-Compensating Models

The MC family of shock absorbers are self-compensating. Providing the effective weight on the application remains within the band given in the capacity charts then no adjustment is necessary for changes in weights, speeds or propelling force. These units are available with five standard operating bands (me min. – me max.) and are identified by the suffix number after the model which goes from -0 (very soft) up to -4 (very hard). The optimum deceleration is achieved when there is no abrupt change in the load velocity at the beginning or the end of the shock absorber stroke.

If there is a hard impact at the start of stroke:
 → use the next softer version (i. e. lower suffix number)

If there is a hard setdown at the end of stroke:
 → use the next harder version, or mount two units in parallel.

Alternatively change to a larger bore size unit. Contact ACE for further advice.

Adjustable Models

The adjustment has a graduated scale from 0 to 9. The adjuster in the body of MA/ML64 has a side mounted locking screw which should be loosened (1/2 turn max.) with a hex. key before commencing adjustment.

The MAGNUM series units can be adjusted by the hex. socket at the rear of the body or by rotating the front stop collar. Both adjusters are internally connected and will show the same adjustment value on the scales as they are turned. After installation cycle the equipment a few times and turn the adjustment until optimum deceleration is achieved (i.e. no abrupt change in the load velocity observed at the beginning or at the end of shock absorber stroke). The shock absorber is delivered set at 5.

If there is a hard impact at start of stroke:
 → adjust the unit softer i. e. towards 9 on the scale

If there is a hard setdown at end of stroke:
 → adjust the unit harder i. e. towards 0.

Adjustment approaching "0" means:

- a) Impact velocity is too low:
 → consider changing to Model type ML or:
- b) Shock absorber selected is too small:
 → use next larger size or mount 2 units in parallel.

Mounting Options

Basic Model



Flange Mounting



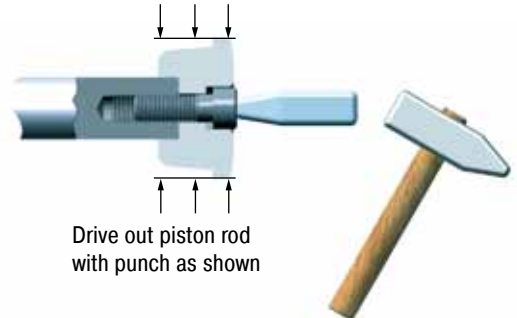
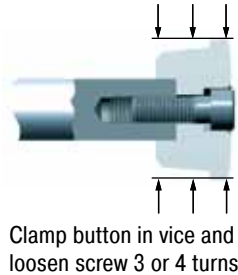
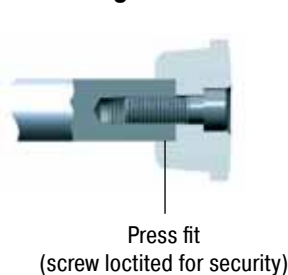
Side Foot Mounting



Clevis Mounting



Removing Rod End Button

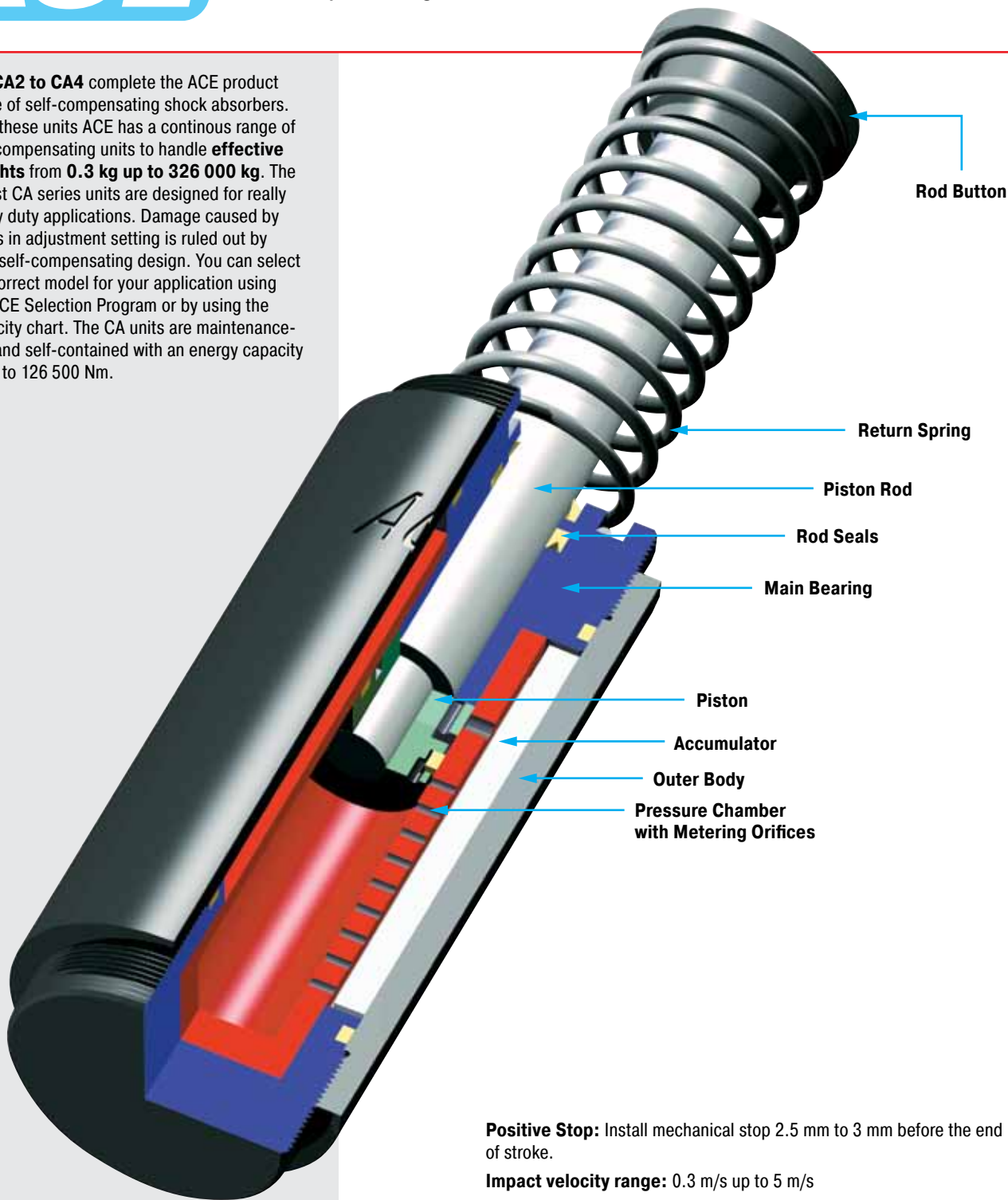


Repairs

It is possible to overhaul ACE shock absorbers in M33 sizes and larger. We would recommend that damaged or worn shock absorbers are returned to ACE for repair. You will find that this is more economic than

the comparative cost of repairing yourself. Spare parts and seal kits etc. are available however if required.

The **CA2 to CA4** complete the ACE product range of self-compensating shock absorbers. With these units ACE has a continuous range of self-compensating units to handle **effective weights from 0.3 kg up to 326 000 kg**. The robust CA series units are designed for really heavy duty applications. Damage caused by errors in adjustment setting is ruled out by their self-compensating design. You can select the correct model for your application using the ACE Selection Program or by using the capacity chart. The CA units are maintenance-free and self-contained with an energy capacity of up to 126 500 Nm.



Positive Stop: Install mechanical stop 2.5 mm to 3 mm before the end of stroke.

Impact velocity range: 0.3 m/s up to 5 m/s

Operating fluid: Automatic Transmission Fluid (ATF) viscosity 42 cSt. at 40 °C

Material: Body and accessories: Steel with black oxide finish. Piston rod: Steel hardened and chrome plated. Rod end button: Steel hardened with black oxide finish. Return spring: Zinc plated. For optimum heat dissipation do not paint outer body.

Capacity rating: For emergency use only applications it may be possible to exceed published energy per cycle (W_3) figures. Please consult ACE for further details.

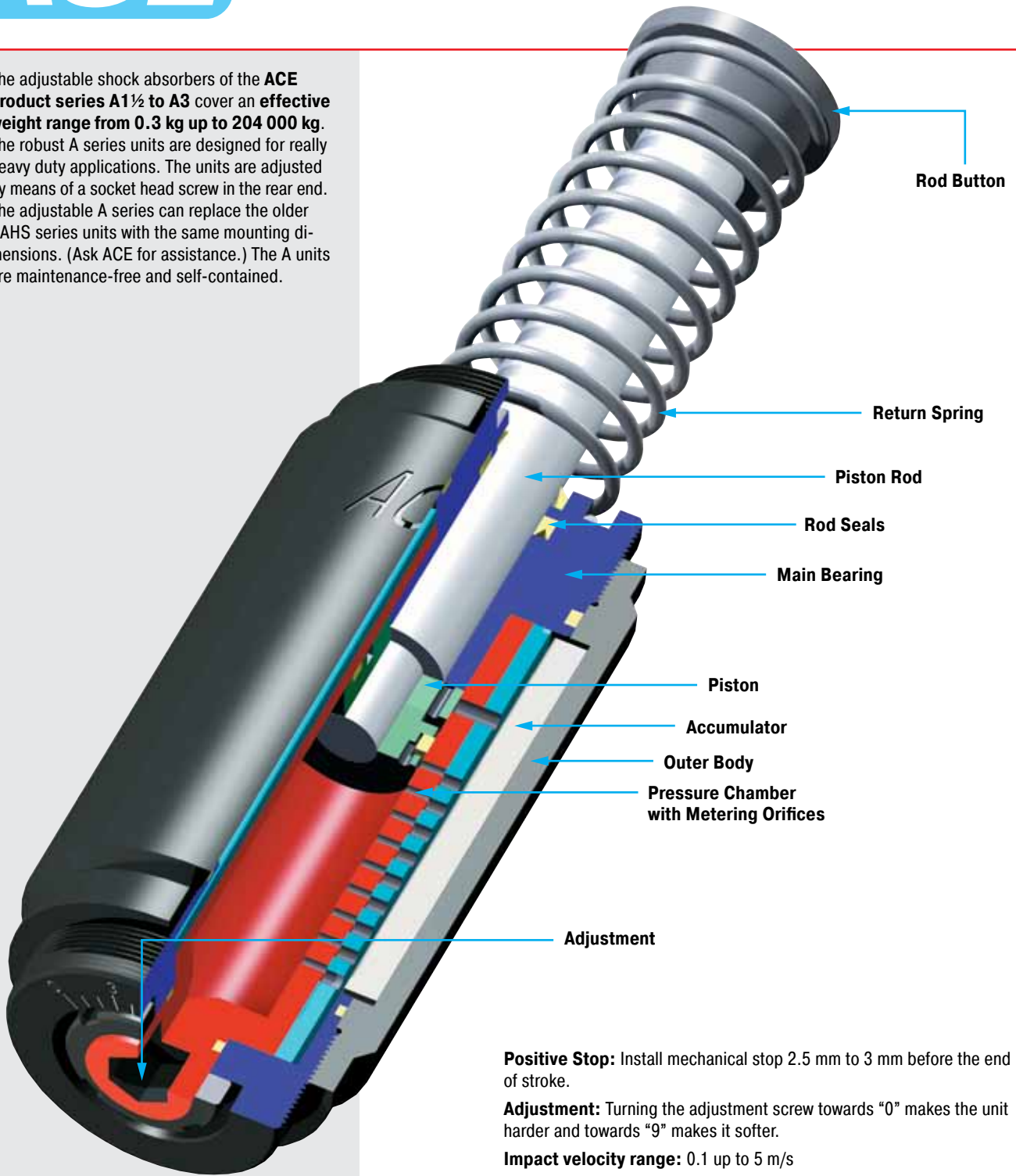
Mounting: In any position

Operating temperature range: -12 °C to 85 °C

On request: Special oils, or for higher or lower impact velocities outside range shown above, or other options please consult ACE.



The adjustable shock absorbers of the **ACE product series A1½ to A3** cover an **effective weight range from 0.3 kg up to 204 000 kg**. The robust A series units are designed for really heavy duty applications. The units are adjusted by means of a socket head screw in the rear end. The adjustable A series can replace the older SAHS series units with the same mounting dimensions. (Ask ACE for assistance.) The A units are maintenance-free and self-contained.



Rod Button

Return Spring

Piston Rod

Rod Seals

Main Bearing

Piston

Accumulator

Outer Body

Pressure Chamber with Metering Orifices

Adjustment

Positive Stop: Install mechanical stop 2.5 mm to 3 mm before the end of stroke.

Adjustment: Turning the adjustment screw towards "0" makes the unit harder and towards "9" makes it softer.

Impact velocity range: 0.1 up to 5 m/s

Operating fluid: Models A1½: HLP46 viscosity 46cSt. at 40 °C. Models A2 and A3: Automatic Transmission Fluid (ATF) viscosity 42 cSt. at 40 °C.

Material: Body and accessories: Steel with black oxide finish. Piston rod: Steel hardened and chrome plated. Rod end button: Steel hardened with black oxide finish. Return spring: Zinc plated. For optimum heat dissipation do not paint outer body.

Capacity rating: For emergency use only applications it may be possible to exceed published energy per cycle (W_3) figures. Please consult ACE for further details.

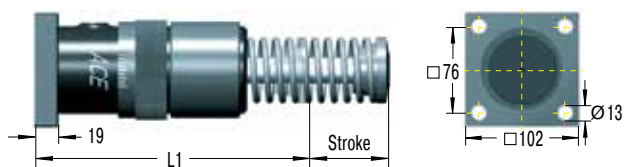
Mounting: In any position

Operating temperature range: -12 °C to 85 °C

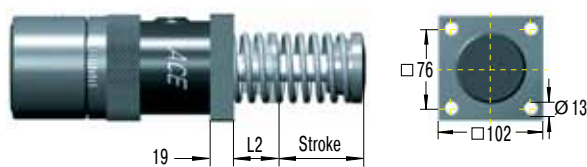
On request: Special oils, or for higher or lower impact velocities outside range shown above, or other options please consult ACE.



Rear Flange -R



Front Flange -F

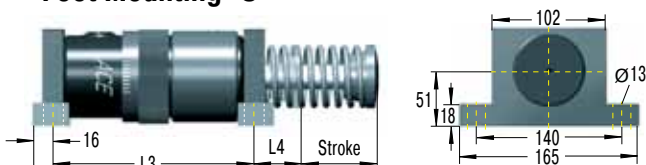


Clevis Mounting -C



Due to limited force capacity the respective ability should be reviewed by ACE.

Foot Mounting -S



Not available on 2" stroke models.

Install mechanical stop 2.5 mm to 3 mm before end of stroke.

Ordering Example

Adjustable _____
 Bore Size Ø 1½" _____
 Stroke Length 2" = 50.8 mm _____
 EU Compliant _____
 Rear Flange Mounting _____

A1½x2EUR

Model Type Prefix

- A = self-contained with return spring
(This is standard model)
- AA = air/oil return without return spring.
Use only with external air/oil tank.
- NA = self-contained without return spring
- SA = air/oil return with return spring.
Use only with external air/oil tank.

Dimensions

Type	Stroke mm	L1	L2	L3	L4	L5
A1½x2EU	50	195.2	54.2	–	–	277.8 - 328.6
A1½x3½EU	89	233	54.2	170	58.6	316.6 - 405.6
A1½x5EU	127	271.5	54.2	208	58.6	354.8 - 481.8
A1½x6½EU	165	329	73	246	78	412 - 577

Capacity Chart

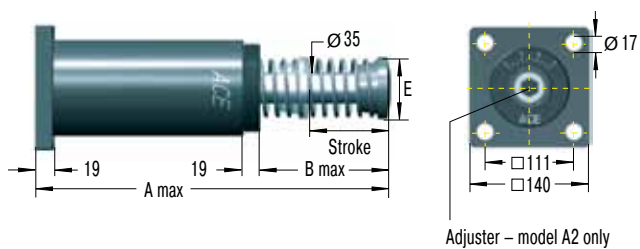
Type	Max. Energy Capacity			1 Effective Weight me		Min. Return Force N	Max. Return Force N	Rod Reset Time s	Max. Side Load Angle °	Weight kg
	2 W ₃ Nm/Cycle	3 W ₄ Self-Contained Nm/h	3 W ₄ with Air/Oil Tank Nm/h	me min. kg	me max. kg					
A1½x2EU	2 350	362 000	452 000	195	32 000	160	210	0.1	5	7.55
A1½x3½EU	4 150	633 000	791 000	218	36 000	110	210	0.25	4	8.9
A1½x5EU	5 900	904 000	1 130 000	227	41 000	90	230	0.4	3	9.35
A1½x6½EU	7 700	1 180 000	1 469 000	308	45 000	90	430	0.4	2	11.95

¹ The effective weight range limits can be raised or lowered to special order.

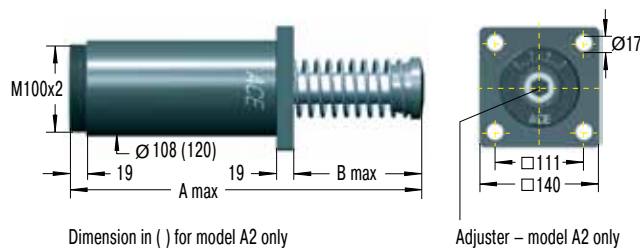
² For emergency use only applications it may be possible to exceed these max. capacity ratings. Please consult ACE for further details.

³ Figures for oil recirculation systems on request.

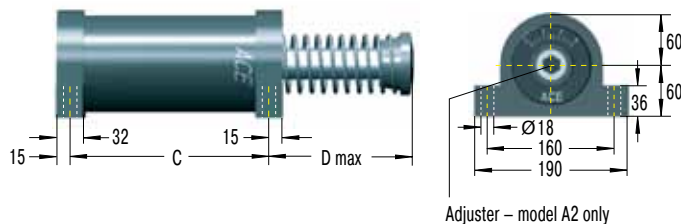
Rear Flange -R



Front Flange -F



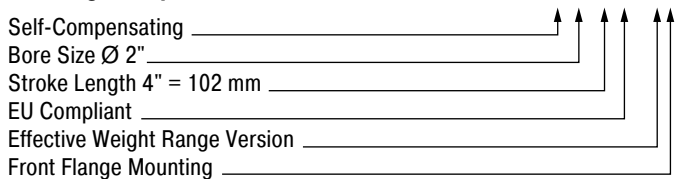
Foot Mounting -SM



Dimensions of clevis mountings available on request.

NOTE! For replacement of existing SAHS 2" foot mounted units order the old type foot mounting S2-A.

Ordering Example



CA2x4EU-3F

Model Type Prefix

- A, CA = self-contained with return spring
(This is standard model)
- AA, CAA = air/oil return without return spring.
Use only with external air/oil tank.
- NA, CNA = self-contained without return spring
- SA, CSA = air/oil return with return spring.
Use only with external air/oil tank.

Dimensions

Type	Stroke mm	A max	B max	C	D max	E
2x2EU	50	313	110	173	125	70
2x4EU	102	414	160	224	175	70
2x6EU	152	516	211	275	226	70
2x8EU	203	643	287	326	302	92
2x10EU	254	745	338	377	353	108

Capacity Chart CA2

Type	Max. Energy Capacity			1 Effective Weight me				Min. Return Force N	Max. Return Force N	Rod Reset Time s	Max. Side Load Angle °	Weight kg
	2 W ₃ Nm/Cycle	3 W ₄ Self-Contained Nm/h	3 W ₄ with Air/Oil Tank Nm/h	Soft		Hard						
				-1 min. max. kg	-2 min. max. kg	-3 min. max. kg	-4 min. max. kg					
CA2x2EU	3 600	1 100 000	1 350 000	700 - 2 200	1 800 - 5 400	4 500 - 13 600	11 300 - 34 000	210	285	0.25	3	12.8
CA2x4EU	7 200	1 350 000	1 700 000	1 400 - 4 400	3 600 - 11 000	9 100 - 27 200	22 600 - 68 000	150	285	0.5	3	14.8
CA2x6EU	10 800	1 600 000	2 000 000	2 200 - 6 500	5 400 - 16 300	13 600 - 40 800	34 000 - 102 000	150	400	0.6	3	16.9
CA2x8EU	14 500	1 900 000	2 400 000	2 900 - 8 700	7 200 - 21 700	18 100 - 54 400	45 300 - 136 000	230	650	0.7	3	19.3
CA2x10EU	18 000	2 200 000	2 700 000	3 600 - 11 000	9 100 - 27 200	22 600 - 68 000	56 600 - 170 000	160	460	0.80	3	22.8

Capacity Chart A2

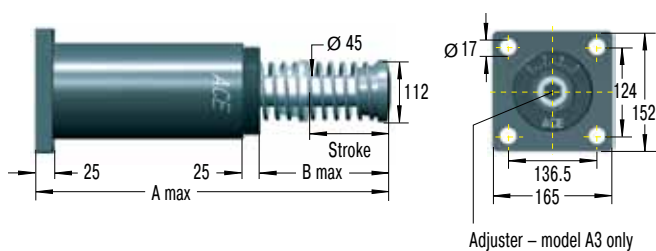
Type	Max. Energy Capacity			1 Effective Weight me		Min. Return Force N	Max. Return Force N	Rod Reset Time s	Max. Side Load Angle °	Weight kg
	2 W ₃ Nm/Cycle	3 W ₄ Self-Contained Nm/h	3 W ₄ with Air/Oil Tank Nm/h	me min. kg	me max. kg					
A2x2EU	3 600	1 100 000	1 350 000	250	77 000	210	285	0.25	3	14.3
A2x4EU	9 000	1 350 000	1 700 000	250	82 000	150	285	0.5	3	16.7
A2x6EU	13 500	1 600 000	2 000 000	260	86 000	150	400	0.6	3	19.3
A2x8EU	19 200	1 900 000	2 400 000	260	90 000	230	650	0.7	3	22.3
A2x10EU	23 700	2 200 000	2 700 000	320	113 000	160	460	0.8	3	26.3

1 The effective weight range limits can be raised or lowered to special order.

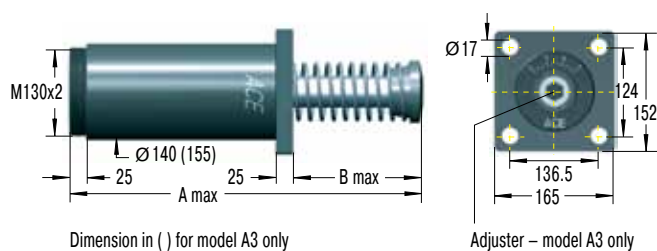
2 For emergency use only applications it may be possible to exceed these max. capacity ratings. Please consult ACE for further details.

3 Figures for oil recirculation systems on request.

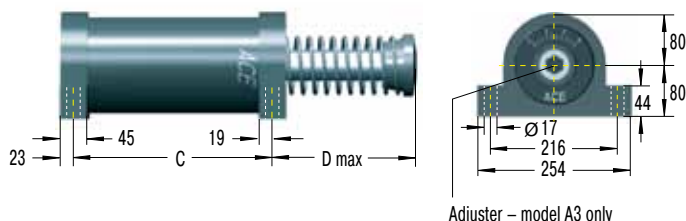
Rear Flange -R



Front Flange -F



Foot Mounting -S



Dimensions of clevis mountings available on request.

NOTE! For replacement of existing SAHS 3" foot mounted units please consult ACE.

Ordering Example

Adjustable _____
 Bore Size Ø 3" _____
 Stroke Length 8" = 203 mm _____
 EU Compliant _____
 Rear Flange Mounting _____

A3x8EUR

Model Type Prefix

- A, CA = self-contained with return spring
(This is standard model)
- AA, CAA = air/oil return without return spring.
Use only with external air/oil tank.
- NA, CNA = self-contained without return spring
- SA, CSA = air/oil return with return spring.
Use only with external air/oil tank.

Abmessungen

Type	Hub mm	A max	B max	C	D max
3x5EU	127	490,5	211	254	224
3x8EU	203	641	286	330	300
3x12EU	305	890	434	432	447

Capacity Chart CA3

Type	Max. Energy Capacity			1 Effective Weight me				Min. Return Force N	Max. Return Force N	Rod Reset Time s	Max. Side Load Angle °	Weight kg				
	2 W ₃ Nm/Cycle	3 W ₄ Self-Contained Nm/h	3 W ₄ with Air/Oil Tank Nm/h	Soft		Hard										
				-1 min. kg	-1 max. kg	-2 min. kg	-2 max. kg						-3 min. kg	-3 max. kg	-4 min. kg	-4 max. kg
CA3x5EU	14 125	2 260 000	2 800 000	2 900	8 700	7 250	21 700	18 100	54 350	45 300	135 900	270	710	0.6	3	28.9
CA3x8EU	22 600	3 600 000	4 520 000	4 650	13 900	11 600	34 800	29 000	87 000	72 500	217 000	280	740	0.8	3	33.4
CA3x12EU	33 900	5 400 000	6 780 000	6 950	20 900	17 400	52 200	43 500	130 450	108 700	326 000	270	730	1.2	3	40.6

Capacity Chart A3

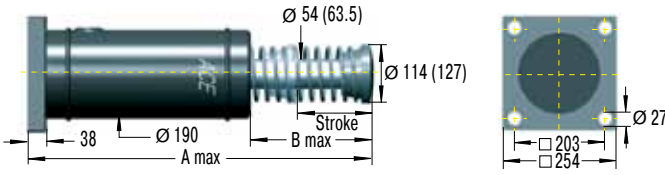
Type	Max. Energy Capacity			1 Effective Weight me		Min. Return Force N	Max. Return Force N	Rod Reset Time s	Max. Side Load Angle °	Weight kg
	2 W ₃ Nm/Cycle	3 W ₄ Self-Contained Nm/h	3 W ₄ with Air/Oil Tank Nm/h	me min. kg	me max. kg					
A3x5EU	15 800	2 260 000	2 800 000	480	154 000	270	710	0.6	3	35.5
A3x8EU	28 200	3 600 000	4 520 000	540	181 500	280	740	0.8	3	39.6
A3x12EU	44 000	5 400 000	6 780 000	610	204 000	270	730	1.2	3	35.5

¹ The effective weight range limits can be raised or lowered to special order.

² For emergency use only applications it may be possible to exceed these max. capacity ratings. Please consult ACE for further details.

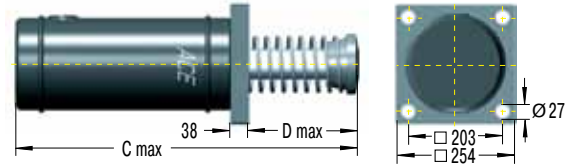
³ Figures for oil recirculation systems on request.

Rear Flange -R

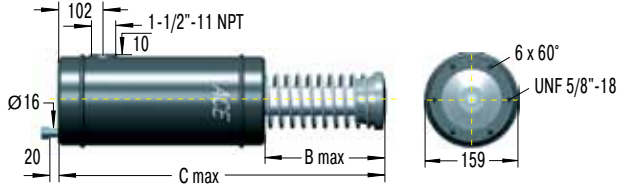


Dimension in () for model CA4x16 only

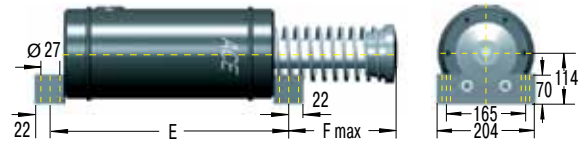
Front Flange -F



6 Tapped Holes (Primary Mounting) FRP

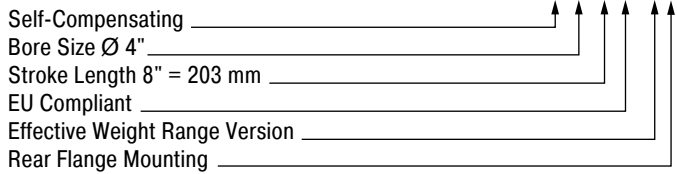


Foot Mounting -S



Dimensions of clevis mountings available on request.

Ordering Example



Model Type Prefix

- CA = self-contained with return spring
(This is standard model)
- CAA = air/oil return without return spring.
Use only with external air/oil tank.
- CNA = self-contained without return spring
- CSA = air/oil return with return spring.
Use only with external air/oil tank.

Dimensions CA/CNA/CSA

Type	Stroke mm	A	B	C	D	E	F
4x6EU	152	716	278	678	240	444	256
4x8EU	203	818	329	780	291	495	307
4x16EU	406	13 000	608.5	1 262.6	569	698	585

Capacity Chart CA4

Type	Max. Energy Capacity				1 Effective Weight me				Min. Return Force N	Max. Return Force N	Rod Reset Time s	Weight kg
	² W ₃ Nm/Cycle	W ₄ Self- Contained Nm/h	W ₄ with Air/Oil Tank Nm/h	W ₄ with Oil Recirculation Nm/h	Soft		Hard					
					-3 min. max. kg	-5 min. max. kg	-7 min. max. kg					
CA4x6EU	47 500	3 000 000	5 100 000	6 600 000	3 500 - 8 600	8 600 - 18 600	18 600 - 42 700	480	1 000	1.8	60	
CA4x8EU	63 300	3 400 000	5 600 000	7 300 000	5 000 - 11 400	11 400 - 25 000	25 000 - 57 000	310	1 000	2.3	68	
CA4x16EU	126 500	5 600 000	9 600 000	12 400 000	10 000 - 23 000	23 000 - 50 000	50 000 - 115 000	310	1 000	Ask	146	

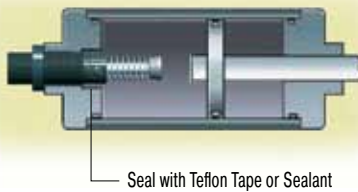
¹ The effective weight range limits can be raised or lowered to special order.

² For emergency use only applications it may be possible to exceed these max. capacity ratings. Please consult ACE for further details.

1 ACE Shock absorbers for pneumatic cylinders

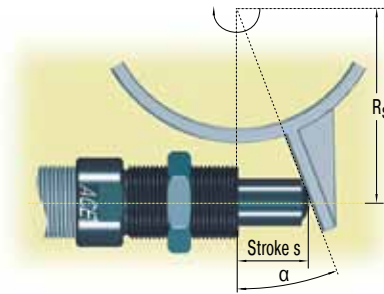
For: optimum deceleration
 higher speeds
 smaller cylinders
 reduced air consumption
 smaller valves and pipework

Example: MA3350EUM-Z (cylinder mounting)



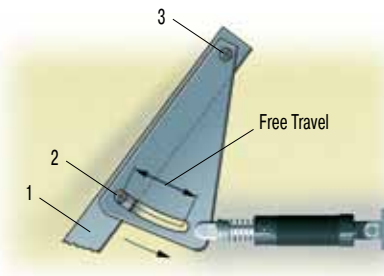
With heavy loads or high velocities normal cylinder cushions are often overloaded. This causes shock loading leading to premature cylinder failure or excessive maintenance. Using oversized cylinders to withstand this shock loading is not the best solution since this considerably increases air consumption and costs.

2 Side load adaptor for high side load angles



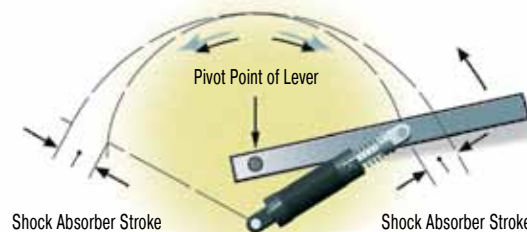
The side loading is removed from the shock absorber piston rod leading to considerably longer life. See pages 40 and 52 for more details.

3 Undamped free travel with damped end position



The lever 1 swings with the pin 2 in a slotted hole around pivot point 3. The lever is smoothly decelerated at the extreme end of its travel.

4 One shock absorber for both ends of travel



It is possible to use only one shock absorber for both end positions by using different pivot points as shown.

Tip: Leave approx. 1.5 mm of shock absorber stroke free at each end of travel.

5 Double acting shock absorber



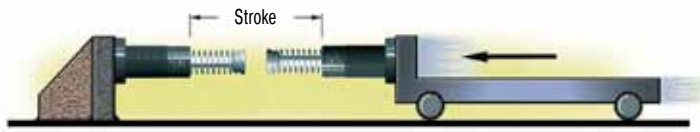
With a little additional work a normal uni-directional shock absorber can be converted to work in 2 directions by using a mechanism as shown.

6 Air bleed collar



By using the air bleed adaptor the operating lifetime of shock absorbers in aggressive environments can be considerably increased. The adaptor protects the shock absorber seals from cutting fluids, cleaning agents, cooking oil etc. by using a low pressure air bleed. For more details see page 39.

7 Double stroke length



50 % lower reaction force (Q)

50 % lower deceleration (a)

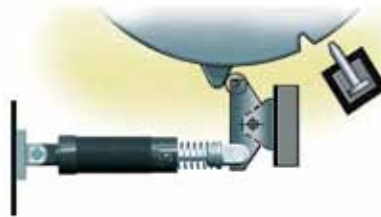
By driving 2 shock absorbers against one another 'nose-to-nose', the effective stroke length can be doubled.

8 Ride over latch

8.1



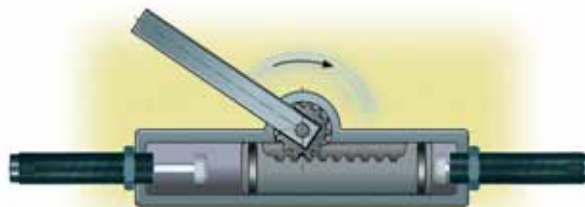
8.2



8.1 The latch absorbs the kinetic energy so that the object contacts the fixed stop gently.

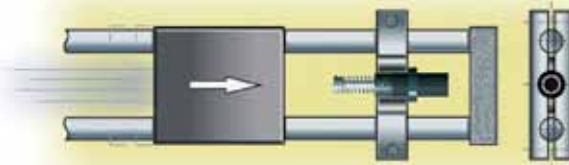
8.2 The latch absorbs the rotational energy of the turntable etc. The turntable can then be held in the datum position with a lock bolt or similar.

9 Rotary actuator or rack and pinion drive



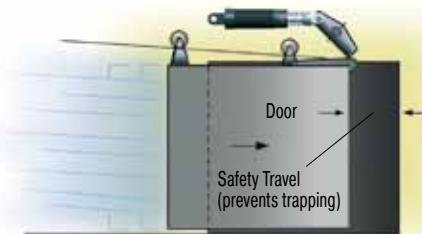
The use of ACE shock absorbers allows higher operating speeds and weights as well as protecting the drive mechanism and housing from shock loads.

10 Adjustable stop clamp e. g. for handling equipment



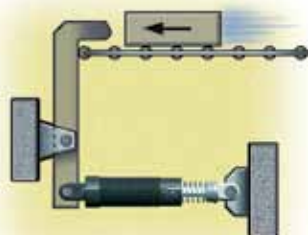
The gentle deceleration of ACE shock absorbers makes the use of adjustable stop clamps possible and removes any chance of the clamp slipping. The kinetic energy is completely removed before the mechanical stop is reached thus making high index speeds possible.

11 Ride-over latch e. g. fire door



The fire door travels quickly until it reaches the lever. It is then gently decelerated by the lever mounted shock absorber and closes without shock or danger to personnel.

12 Increasing stroke length mechanically



By means of a lever the effective stroke length can be increased and mounting space to the left reduced.



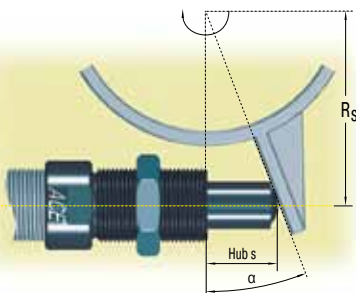
Constant resisting force

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 **MC25EUMH-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 linear pneumatic module



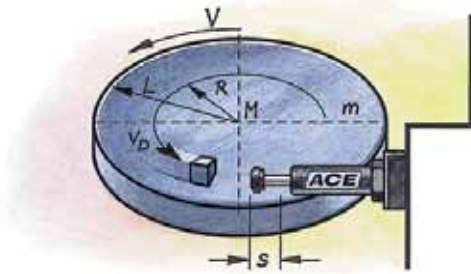
Soft end-of-travel damping on rotary movements

ACE miniature shock absorbers optimize production with minimum expenditure.

The cycle rate for an assembly line producing electronic components was increased to 3600 units/hr by using ACE shock absorbers. Miniature shock absorbers type **SC190EUM-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



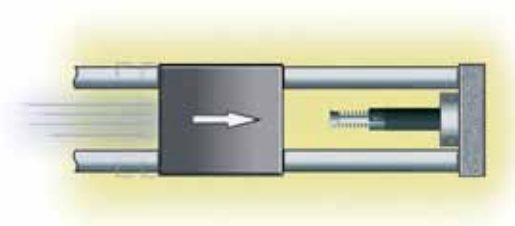
Safe swiveling

ACE industrial shock absorbers offer safety to spare for swiveling or braking of large telescope.

The optical system of this telescope for special observations is moveable in two space coordinates. The structure in which the telescope is mounted weighs 15 000 kg and consists of a turntable with drives and two wheel disks rotating on bearings. It enables a rotation by $\pm 90^\circ$ from horizon to horizon. To safeguard the telescope in case of overshooting the respective swiveling limits, industrial shock absorbers of the type **ML3325EUM** are used as braking elements. Should the telescope inadvertently overshoot the permissible swivel range, they will safely damp the travel of the valuable telescope.



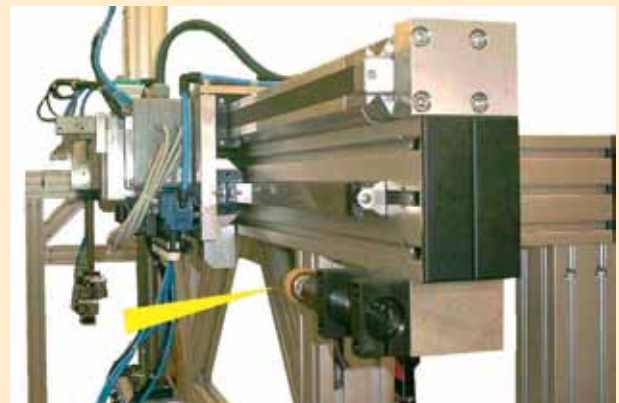
Perfect overshoot protection for precision telescope



Quicker, gentle positioning

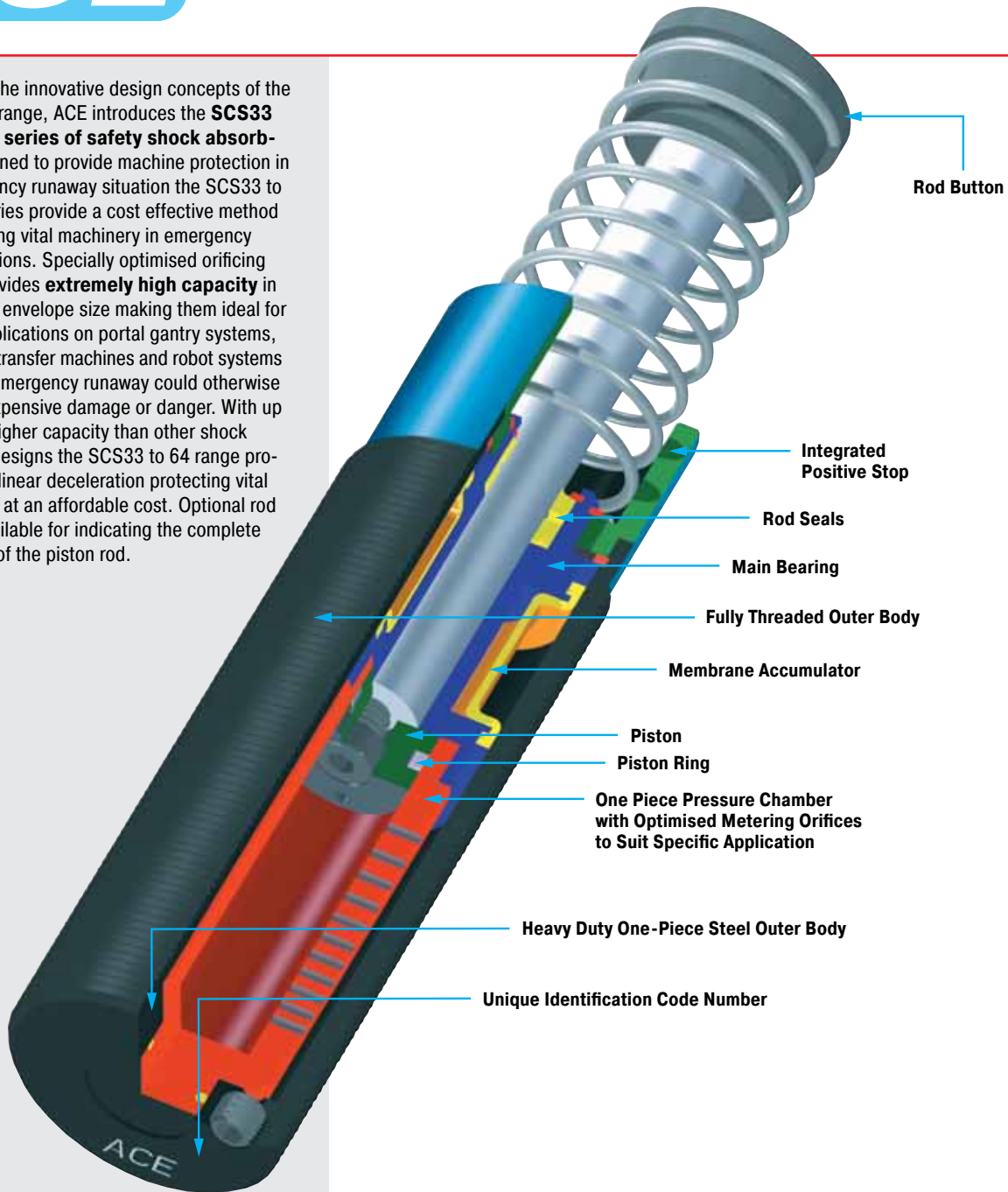
ACE industrial shock absorbers optimize portal for machine loading and increase productivity.

This device driven by piston rodless pneumatic cylinders, in which two gripper slides are moving independently of each other at speeds of 2 to 2.5 m/sec., is equipped with industrial shock absorbers as brake systems. Their function is to stop a mass of 25 kg up to 540 times per hour. The model **MC3350EUM-1-S** was chosen for this application, allowing easy and extremely accurate adjustment of the end positions of the adjustable limit stops. In comparison to brake systems with other function principles, shock absorbers allow higher travel speeds and shorter cycle sequences.



Industrial shock absorbers optimize portal operation

Based on the innovative design concepts of the MAGNUM range, ACE introduces the **SCS33 to SCS64 series of safety shock absorbers**. Designed to provide machine protection in an emergency runaway situation the SCS33 to SCS64 series provide a cost effective method of protecting vital machinery in emergency stop situations. Specially optimised orificing design provides **extremely high capacity** in a compact envelope size making them ideal for critical applications on portal gantry systems, automatic transfer machines and robot systems where an emergency runaway could otherwise result in expensive damage or danger. With up to 300% higher capacity than other shock absorber designs the SCS33 to 64 range provides true linear deceleration protecting vital equipment at an affordable cost. Optional rod sensor available for indicating the complete retraction of the piston rod.



Impact cycles per hour: max. 1

Life expectancy: Self-compensating version: max. 1000 cycles.
Optimised version: max. 5 cycles.

Impact velocity range: On request

Operating fluid: Automatic Transmission Fluid (ATF) at 42cSt.

Material: Shock absorber body: Nitride hardened steel. Accessories: Steel with black oxide finish. Piston rod: Steel hardened and chrome plated. Rod end button: Hardened steel with black oxide finish. Return Spring: Zinc plated or plastic-coated.

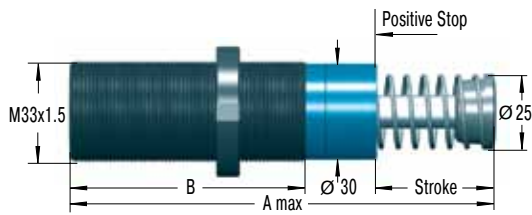
Energy capacity W_3 : At max. side load angle do not exceed 80% of rated max. energy capacity below.

Mounting: In any position

Operating temperature range: -12 °C to 70 °C. Higher temperatures on request.

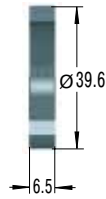
In creep speed: The shock absorber can be pushed through its stroke. In creep speed conditions the shock absorber provides minimal resistance and there is no braking effect.





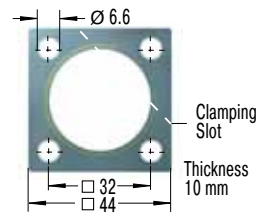
Standard Dimensions

NM33



Locking Ring

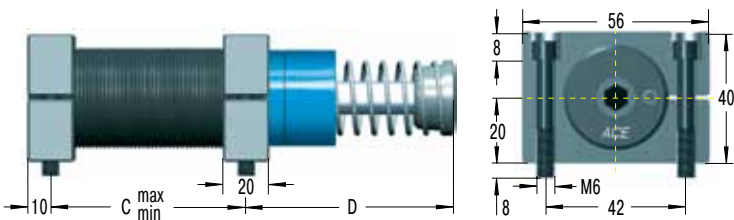
QF33



Square Flange

Install with 4 machine screws
Tightening torque: 11 Nm
Clamping torque: > 90 Nm

S33



Side Foot Mounting Kit

S33 = 2 flanges + 4 screws M6x40, DIN 912
Because of the thread pitch the fixing holes for the second foot mount should only be drilled and tapped after the first foot mount has been fixed in position.

Tightening torque: 11 Nm (screws)
Clamping torque: > 90 Nm

Ordering Example

Safety Shock Absorber _____
Thread Size M33 _____
Max. Stroke without Positive Stop 50 mm _____
EU Compliant _____
Mounting Style: Foot _____
Identification No. assigned by ACE _____
Please indicate identification no. in case of replacement order

SCS33-50EU-S-2xxxx

Complete Details Required when Ordering

Moving load m (kg)
Impact velocity range v (m/s) max.
Creep speed vs (m/s)
Motor power P (kW)
Stall torque factor ST (normal 2.5)
Number of absorbers in parallel n

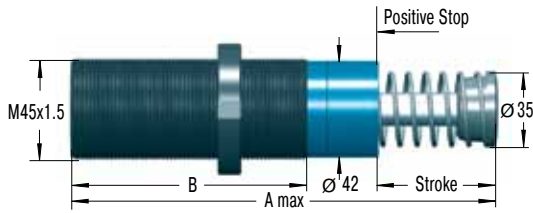
or technical data according to formulae and calculations on page 15 to 17.

The calculation and selection of the correct ACE safety shock absorber for your application should be referred to ACE for approval and assignment of unique identification number.

Dimensions and Capacity Chart

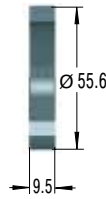
Type	Stroke mm	A max	B	C min	C max	D	Max. Energy Capacity		Min. Return Force N	Max. Return Force N	Max. Side Load Angle °	Weight kg
							Self-Compensating W ₃ Nm/Cycle	Optimised Version W ₃ Nm/Cycle				
SCS33-25EU	23	138	83	25	60	68	310	500	45	90	3	0.45
SCS33-50EU	48.5	189	108	32	86	93	620	950	45	135	2	0.54

For other stroke lengths, special options (such as higher or lower impact velocity etc.), please consult ACE.



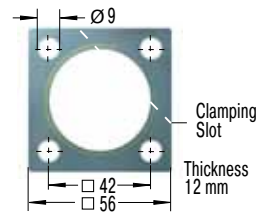
Standard Dimensions

NM45



Locking Ring

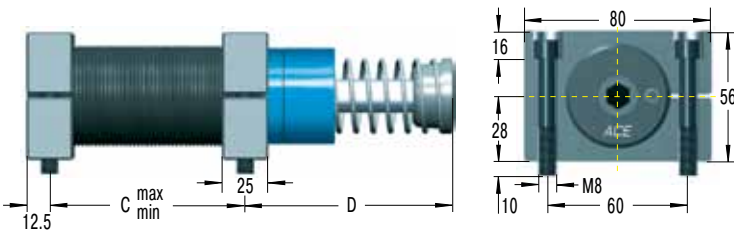
QF45



Square Flange

Install with 4 machine screws
Tightening torque: 27 Nm
Clamping torque: > 200 Nm

S45



Side Foot Mounting Kit

S45 = 2 flanges + 4 screws M8x50, DIN 912
Because of the thread pitch the fixing holes for the second foot mount should only be drilled and tapped after the first foot mount has been fixed in position.

Tightening torque: 27 Nm (screws)
Clamping torque: > 350 Nm

Ordering Example

Safety Shock Absorber _____
Thread Size M45 _____
Max. Stroke without Positive Stop 50 mm _____
EU Compliant _____
Mounting Style: Foot _____
Identification No. assigned by ACE _____

SCS45-50EU-S-2xxxx

Please indicate identification no. in case of replacement order

Complete Details Required when Ordering

Moving load m (kg)
Impact velocity range v (m/s) max.
Creep speed vs (m/s)
Motor power P (kW)
Stall torque factor ST (normal 2.5)
Number of absorbers in parallel n

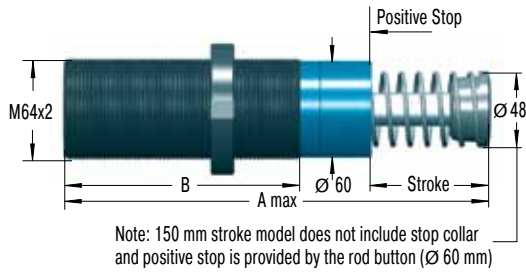
or technical data according to formulae and calculations on page 15 to 17.

The calculation and selection of the correct ACE safety shock absorber for your application should be referred to ACE for approval and assignment of unique identification number.

Dimensions and Capacity Chart

Type	Stroke mm	A max	B	C min	C max	D	Max. Energy Capacity		Min. Return Force N	Max. Return Force N	Max. Side Load Angle °	Weight kg
							Self-Compensating W ₃ Nm/Cycle	Optimised Version W ₃ Nm/Cycle				
SCS45-25EU	23	145	95	32	66	66	680	1 200	70	100	3	1.13
SCS45-50EU	48.5	195	120	40	92	91	1 360	2 350	70	145	2	1.36
SCS45-75EU	74	246	145	50	118	116	2 040	3 500	50	180	1	1.59

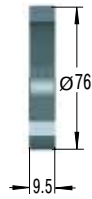
For other stroke lengths, special options (such as higher or lower impact velocity etc.), please consult ACE.



Standard Dimensions

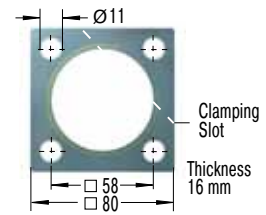
Note: 150 mm stroke model does not include stop collar and positive stop is provided by the rod button (Ø 60 mm)

NM64



Locking Ring

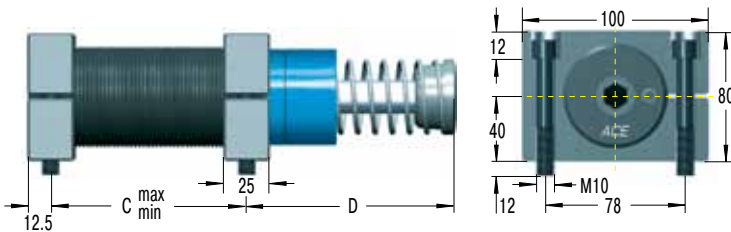
QF64



Square Flange

Install with 4 machine screws
Tightening torque: 50 Nm
Clamping torque: > 210 Nm

S64



Side Foot Mounting Kit

S64 = 2 flanges + 4 screws M10x80, DIN 912
Because of the thread pitch the fixing holes for the second foot mount should only be drilled and tapped after the first foot mount has been fixed in position.

Tightening torque: 50 Nm (screws)
Clamping torque: > 350 Nm

Ordering Example

Safety Shock Absorber _____
Thread Size M64 _____
Max. Stroke without Positive Stop 50 mm _____
EU Compliant _____
Mounting Style: Foot _____
Identification No. assigned by ACE _____

SCS64-50EU-S-2xxxx

Please indicate identification no. in case of replacement order

Complete Details Required when Ordering

Moving load m (kg)
Impact velocity range v (m/s) max.
Creep speed vs (m/s)
Motor power P (kW)
Stall torque factor ST (normal 2.5)
Number of absorbers in parallel n

or technical data according to formulae and calculations on page 15 to 17.

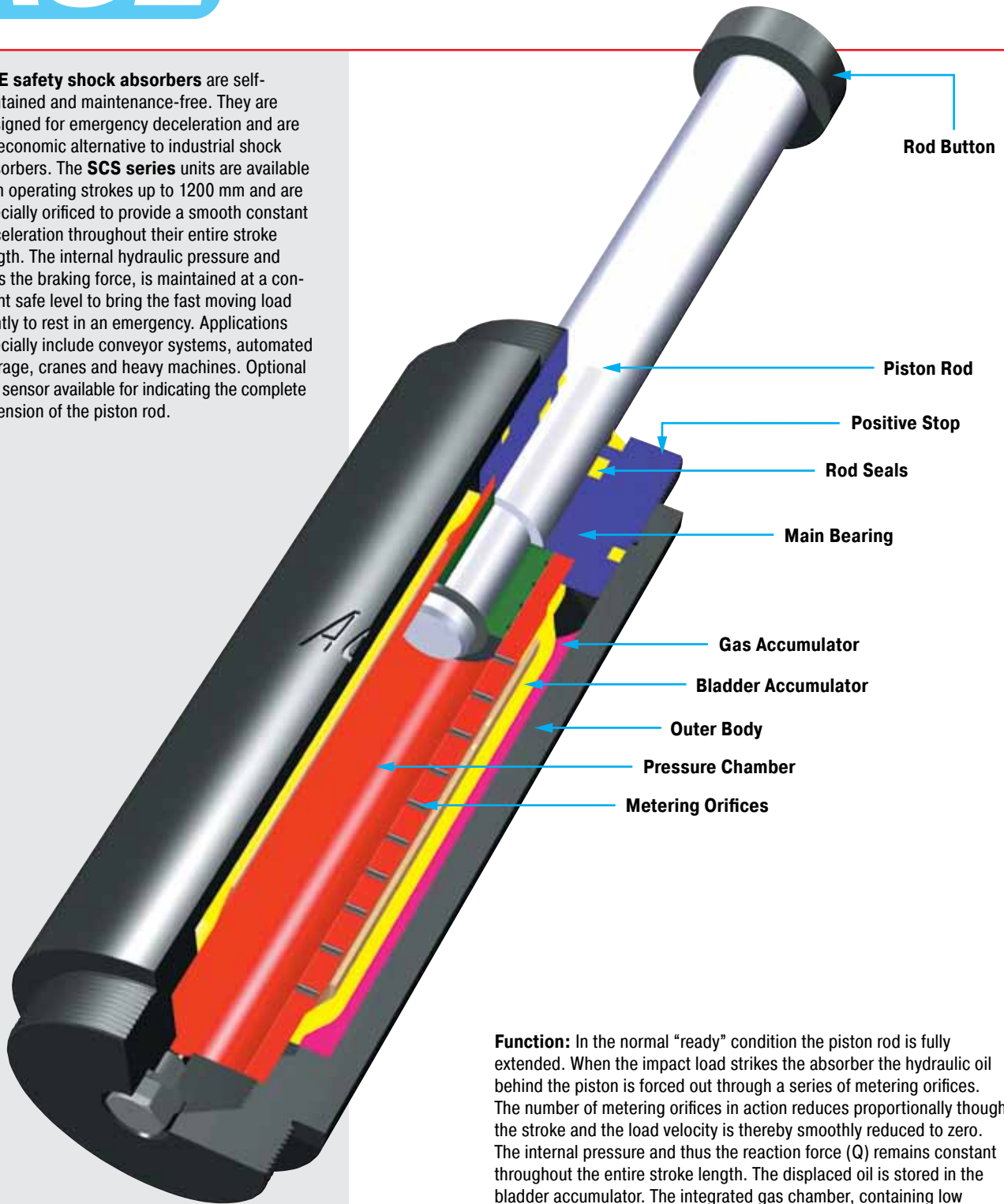
The calculation and selection of the correct ACE safety shock absorber for your application should be referred to ACE for approval and assignment of unique identification number.

Dimensions and Capacity Chart

Type	Stroke mm	A max	B	C min	C max	D	Max. Energy Capacity		Min. Return Force N	Max. Return Force N	Max. Side Load Angle °	Weight kg
							Self-Compensating W ₃ Nm/Cycle	Optimised Version W ₃ Nm/Cycle				
SCS64-50EU	48.5	225	140	50	112	100	3 400	6 000	90	155	3	3.18
SCS64-100EU	99.5	326	191	64	162	152	6 800	12 000	105	270	2	4.2
SCS64-150EU	150	450	241	80	212	226	10 200	18 000	75	365	1	5.65

For other stroke lengths, special options (such as higher or lower impact velocity etc.), please consult ACE.

ACE safety shock absorbers are self-contained and maintenance-free. They are designed for emergency deceleration and are an economic alternative to industrial shock absorbers. The **SCS series** units are available with operating strokes up to 1200 mm and are specially orificed to provide a smooth constant deceleration throughout their entire stroke length. The internal hydraulic pressure and thus the braking force, is maintained at a constant safe level to bring the fast moving load gently to rest in an emergency. Applications specially include conveyor systems, automated storage, cranes and heavy machines. Optional rod sensor available for indicating the complete extension of the piston rod.



Function: In the normal "ready" condition the piston rod is fully extended. When the impact load strikes the absorber the hydraulic oil behind the piston is forced out through a series of metering orifices. The number of metering orifices in action reduces proportionally though the stroke and the load velocity is thereby smoothly reduced to zero. The internal pressure and thus the reaction force (Q) remains constant throughout the entire stroke length. The displaced oil is stored in the bladder accumulator. The integrated gas chamber, containing low pressure nitrogen, provides the return force to reset the rod to its extended position and functions as an accumulator for the hydraulic oil displaced during the operation.

Material: Steel body with black oxide finish. Piston rod hard chrome plated.

Energy capacity W_3 : At max. side load angle do not exceed 80% of rated max. energy capacity below.

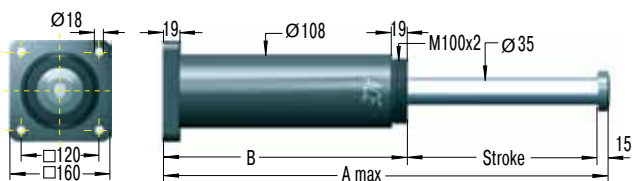
Filling pressure: Approx. 2 bar

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

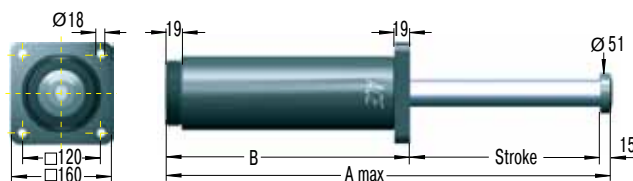
In creep speed: It is possible to use up to approx. 60% of the buffer stroke. In creep speed conditions the shock absorber provides minimal resistance and there is no braking effect.



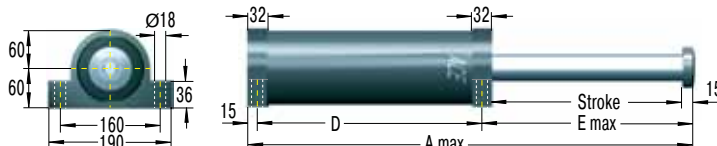
Rear Flange -R



Front Flange -F



Foot Mounting -S



Ordering Example

Safety Shock Absorber _____
 Bore Size Ø 38 mm _____
 Stroke 400 mm _____
 EU Compliant _____
 Mounting Style: Front Flange _____
 Identification No. assigned by ACE _____

SCS38-400EU-F-X

Please indicate identification no. in case of replacement order

Complete Details Required when Ordering

Moving load m (kg)
 Impact velocity range v (m/s) max.
 Creep speed vs (m/s)
 Motor power P (kW)
 Stall torque factor ST (normal 2.5)
 Number of absorbers in parallel n

or technical data according to formulae and calculations on page 15 to 17.

The calculation and selection of the correct ACE safety shock absorber for your application should be referred to ACE for approval and assignment of unique identification number.

Technical Data

Impact velocity range: 0.9 to 4.6 m/s

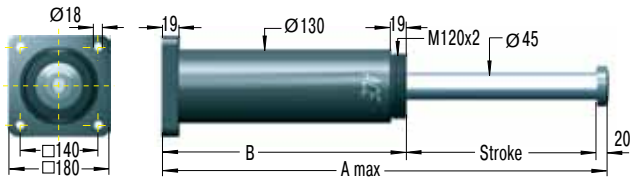
Reacting force Q: At max. capacity rating = **80 kN max.**

Dimensions and Capacity Chart

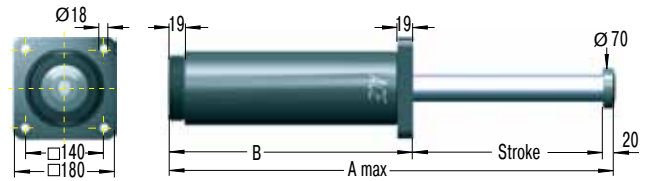
Type	Stroke mm	A max	B	D	E max	Max. Energy Capacity W ₃ Nm/Cycle	Mounting Style							
							Min. Return Force N		Max. Return Force N		F & S		R	
							Min. Force N	Max. Force N	Max. Side Load Angle °	Max. Side Load Angle °	F & R Weight kg	S Weight kg		
SCS38-50EU	50	270	205	175	80	3 600	600	700	5	4	12	13		
SCS38-100EU	100	370	255	225	132	7 200	600	700	5	4	14	15		
SCS38-150EU	150	470	305	275	180	10 800	600	700	5	4	16	17		
SCS38-200EU	200	570	355	325	230	14 400	600	700	5	4	18	19		
SCS38-250EU	250	670	405	375	280	18 000	600	700	4.7	3.7	20	21		
SCS38-300EU	300	785	470	440	330	21 600	600	700	3.9	2.9	22	23		
SCS38-350EU	350	885	520	490	380	25 200	600	700	3.4	2.4	24	25		
SCS38-400EU	400	1 000	585	555	430	28 800	600	700	3	2	26	27		
SCS38-500EU	500	1 215	700	670	530	36 000	600	700	2.4	1.4	30	31		
SCS38-600EU	600	1 430	815	785	630	43 200	600	700	1.9	0.9	34	35		
SCS38-700EU	700	1 645	930	900	730	50 400	600	700	1.6	0.6	38	39		
SCS38-800EU	800	1 860	1 045	1 015	830	57 600	600	700	1.3	0.3	43	44		

For other stroke lengths, special options (such as higher or lower impact velocity etc.), please consult ACE.

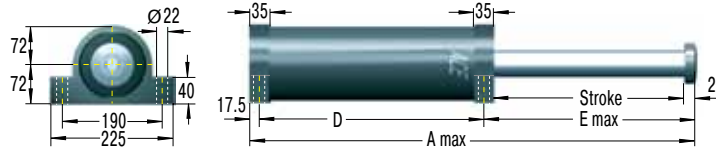
Rear Flange -R



Front Flange -F



Foot Mounting -S



Ordering Example

Safety Shock Absorber _____
 Bore Size Ø 50 mm _____
 Stroke 400 mm _____
 EU Compliant _____
 Mounting Style: Front Flange _____
 Identification No. assigned by ACE _____

SCS50-400EU-F-X

Please indicate identification no. in case of replacement order

Complete Details Required when Ordering

Moving load m (kg)
 Impact velocity range v (m/s) max.
 Creep speed vs (m/s)
 Motor power P (kW)
 Stall torque factor ST (normal 2.5)
 Number of absorbers in parallel n

or technical data according to formulae and calculations on page 15 to 17.

The calculation and selection of the correct ACE safety shock absorber for your application should be referred to ACE for approval and assignment of unique identification number.

Technical Data

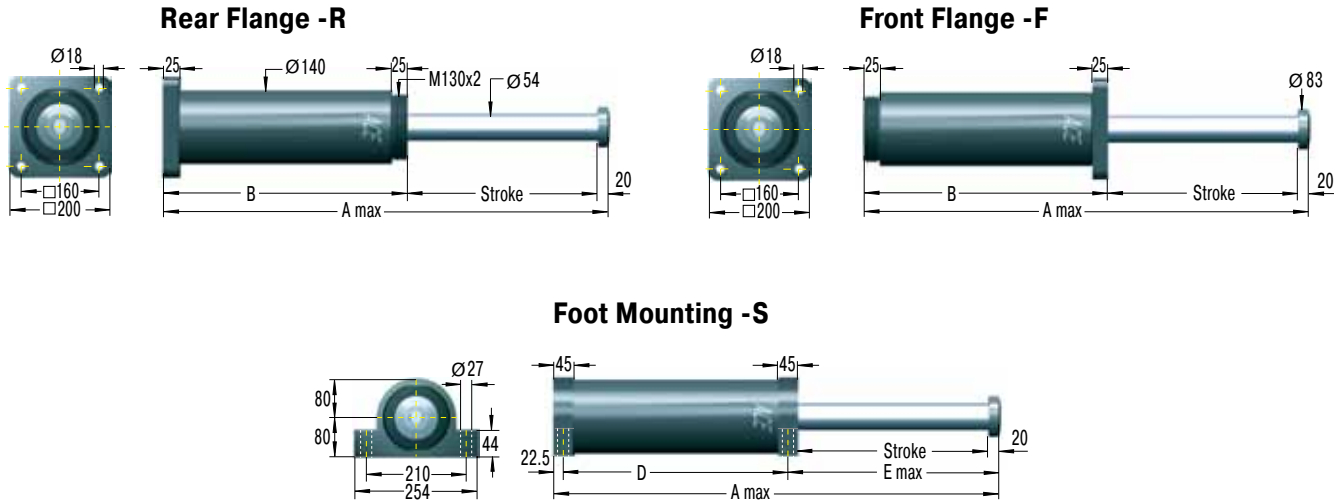
Impact velocity range: 0.6 to 4.6 m/s

Reacting force Q: At max. capacity rating = **160 kN max.**

Dimensions and Capacity Chart

Type	Stroke mm	A max	B	D	E max	Max. Energy Capacity W ₃ Nm/Cycle	Mounting Style							
							Min. Return Force N		Max. Return Force N		F & S		R	
							Min. Force N	Max. Force N	Max. Side Load Angle °	Max. Side Load Angle °	F & R Weight kg	S Weight kg		
SCS50-100EU	100	390	270	235	138	14 000	1 000	1 200	5	4	22	23		
SCS50-150EU	150	490	320	285	188	21 000	1 000	1 200	5	4	25	26		
SCS50-200EU	200	590	370	335	238	28 000	1 000	1 200	5	4	27	28		
SCS50-250EU	250	690	420	385	288	35 000	1 000	1 200	4.5	3.5	30	31		
SCS50-300EU	300	805	485	450	338	42 000	1 000	1 200	3.8	2.8	33	34		
SCS50-350EU	350	905	535	500	388	49 000	1 000	1 200	3.3	2.3	35	37		
SCS50-400EU	400	1 020	600	565	438	56 000	1 000	1 200	2.9	1.9	38	40		
SCS50-500EU	500	1 235	715	680	538	70 000	1 000	1 200	2.3	1.3	44	45		
SCS50-600EU	600	1 450	830	795	638	84 000	1 000	1 200	1.9	0.9	50	51		
SCS50-700EU	700	1 665	945	910	738	98 000	1 000	1 200	1.6	0.6	55	57		
SCS50-800EU	800	1 880	1 060	1 025	838	112 000	1 000	1 200	1.3	0.3	61	63		
SCS50-1000EU	1 000	2 310	1 290	1 255	1 038	140 000	1 000	1 200	1	0	72	74		

For other stroke lengths, special options (such as higher or lower impact velocity etc.), please consult ACE.



Ordering Example

Safety Shock Absorber _____
 Bore Size \varnothing 63 mm _____
 Stroke 400 mm _____
 EU Compliant _____
 Mounting Style: Front Flange _____
 Identification No. assigned by ACE _____

SCS63-400EU-F-X

Please indicate identification no. in case of replacement order

Complete Details Required when Ordering

Moving load _____ m (kg)
 Impact velocity range _____ v (m/s) max.
 Creep speed _____ vs (m/s)
 Motor power _____ P (kW)
 Stall torque factor _____ ST (normal 2.5)
 Number of absorbers in parallel _____ n

or technical data according to formulae and calculations on page 15 to 17.

The calculation and selection of the correct ACE safety shock absorber for your application should be referred to ACE for approval and assignment of unique identification number.

Technical Data

Impact velocity range: 0.5 to 4.6 m/s

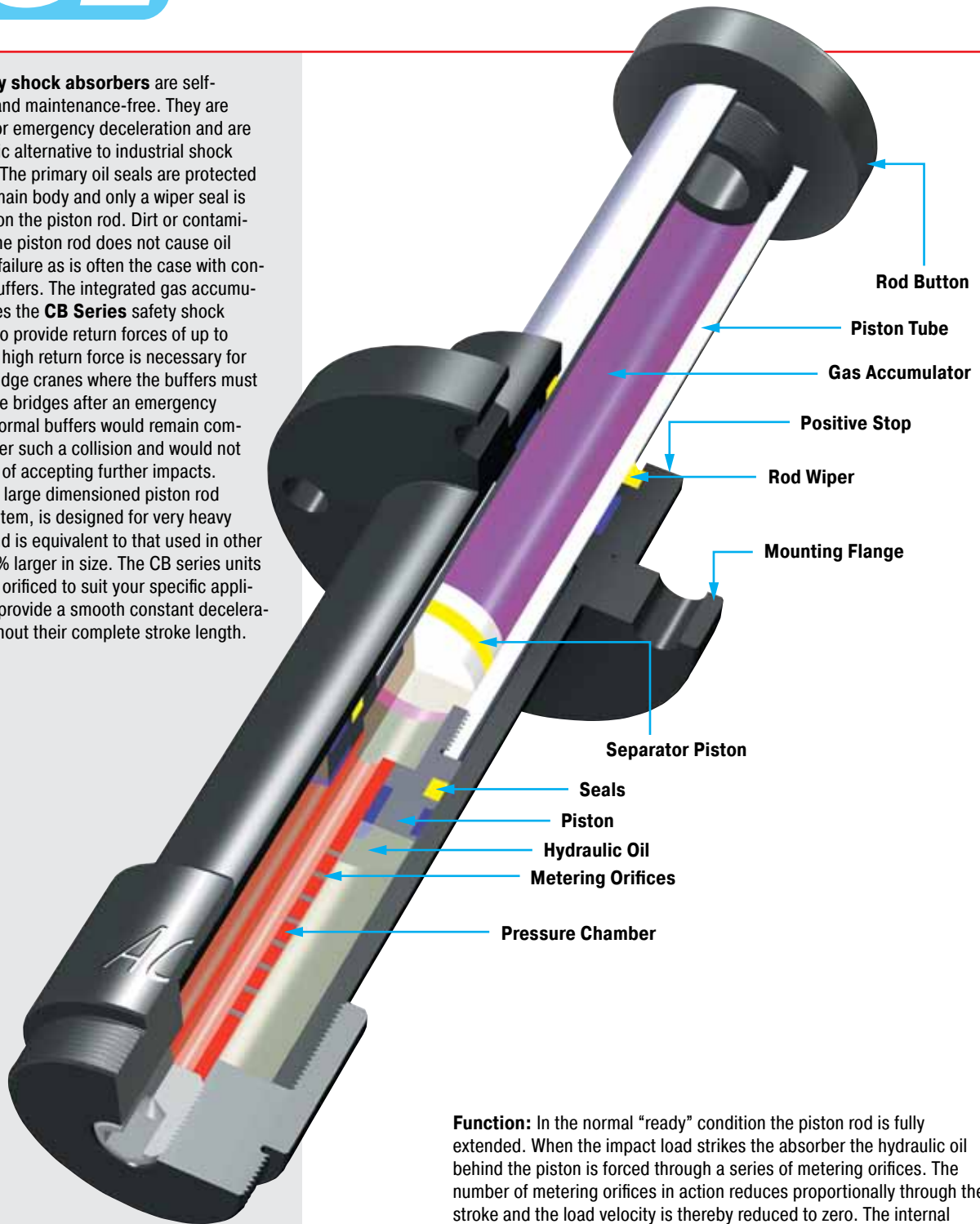
Reacting force Q: At max. capacity rating = **210 kN max.**

Dimensions and Capacity Chart

Type	Stroke mm	A max	B	D	E max	Max. Energy Capacity W ₃ Nm/Cycle	Mounting Style							
							Min. Return Force N		Max. Return Force N		F & S		R	
							Min. Force N	Max. Force N	Max. Side Load Angle °	Max. Side Load Angle °	F & R Weight kg	S Weight kg		
SCS63-100EU	100	405	285	240	143	18 000	1 500	2 500	5	4	29	32		
SCS63-150EU	150	505	335	290	193	27 000	1 500	2 500	5	4	32	35		
SCS63-200EU	200	605	385	340	243	36 000	1 500	2 500	5	4	36.2	38		
SCS63-250EU	250	705	435	390	293	45 000	1 500	2 500	5	4	38	42		
SCS63-300EU	300	805	485	440	343	54 000	1 500	2 500	5	4	41	45		
SCS63-350EU	350	925	555	510	393	63 000	1 500	2 500	5	4	45	49		
SCS63-400EU	400	1 025	605	560	443	72 000	1 500	2 500	5	4	48	52		
SCS63-500EU	500	1 245	725	680	543	90 000	1 500	2 500	4.2	3.2	55	60		
SCS63-600EU	600	1 445	825	780	643	108 000	1 500	2 500	3.4	2.4	62	66		
SCS63-700EU	700	1 665	945	900	746	126 000	1 500	2 500	2.9	1.9	69	73		
SCS63-800EU	800	1 865	1 045	1 000	843	144 000	1 500	2 500	2.5	1.5	75	79		
SCS63-1000EU	1 000	2 285	1 265	1 220	1 043	180 000	1 500	2 500	1.9	0.9	89	93		
SCS63-1200EU	1 200	2 705	1 485	1 440	1 243	216 000	1 500	2 500	1.4	0.4	102	106		

For other stroke lengths, special options (such as higher or lower impact velocity etc.), please consult ACE.

ACE safety shock absorbers are self-contained and maintenance-free. They are designed for emergency deceleration and are an economic alternative to industrial shock absorbers. The primary oil seals are protected inside the main body and only a wiper seal is necessary on the piston rod. Dirt or contamination on the piston rod does not cause oil leakage or failure as is often the case with conventional buffers. The integrated gas accumulator enables the **CB Series** safety shock absorbers to provide return forces of up to 71 kN. This high return force is necessary for multiple-bridge cranes where the buffers must separate the bridges after an emergency collision. Normal buffers would remain compressed after such a collision and would not be capable of accepting further impacts. The robust, large dimensioned piston rod bearing system, is designed for very heavy duty use and is equivalent to that used in other buffers 80 % larger in size. The CB series units are custom orificed to suit your specific application and provide a smooth constant deceleration throughout their complete stroke length.



Function: In the normal "ready" condition the piston rod is fully extended. When the impact load strikes the absorber the hydraulic oil behind the piston is forced through a series of metering orifices. The number of metering orifices in action reduces proportionally through the stroke and the load velocity is thereby reduced to zero. The internal pressure and thus the reaction force (Q) remains constant throughout the entire stroke length. The displaced oil is directed inside the piston rod where a separator piston keeps the oil and the nitrogen gas apart. The integrated gas accumulator, containing low pressure nitrogen, provides the high return force to reset the rod to its extended position and generates the high return forces to comply with crane installations.

Impact velocity range:
0.5 to 4.6 m/s

Material: Steel body with black oxide finish. Piston rod hard chrome plated.

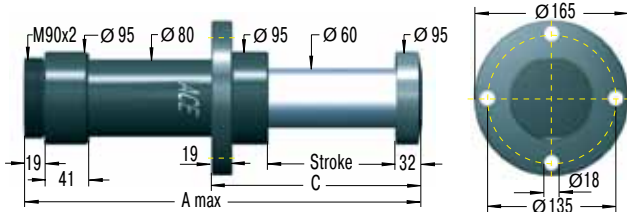
Operating temperature range:
-12 °C to 66 °C

Initial fill pressure: governs the rod return force.

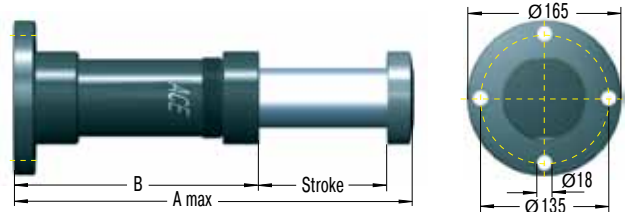
In creep speed: The shock absorber can be pushed through its stroke.



Front Flange -F



Rear Flange -R



Ordering Example

Safety Shock Absorber _____
 Bore Size Ø 63 mm _____
 Stroke 400 mm _____
 EU Compliant _____
 Mounting Style: Front Flange _____
 Identification No. assigned by ACE _____

CB63-400EU-F-X

Please indicate identification no. in case of replacement order

Complete Details Required when Ordering

Moving load m (kg)
 Impact velocity range v (m/s)max.
 Creep speed vs (m/s)
 Motor power P (kW)
 Stall torque factor ST (normal 2.5)
 Number of absorbers in parallel n

or technical data according to formulae and calculations on page 15 to 17.

The calculation and selection of the correct ACE safety shock absorber for your application should be referred to ACE for approval and assignment of unique identification number.

Technical Data

Reacting force Q: At max. capacity rating = **187 kN max.**

Rod return: Nitrogen accumulator (5.6 bar to 5.9 bar)

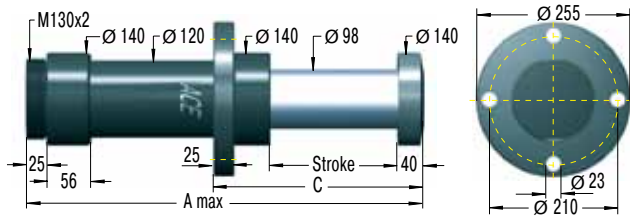
Dimensions and Capacity Chart

Type	Stroke mm	A max	B	C	Max. Energy Capacity W ₃ Nm/Cycle	1 Effective Weight me		Min. Return Force N	Max. Return Force N	Max. Side Load Angle °	Weight kg
						me min. kg	me max. kg				
CB63-100EU	100	420	288	192	16 000	900	128 000	1 700	18 500	3.5	12.7
CB63-200EU	200	700	468	292	32 000	1 800	256 000	1 700	24 000	3	16.7
CB63-300EU	300	980	648	392	48 000	2 700	384 000	1 700	27 000	2.5	20.8
CB63-400EU	400	1 260	828	492	64 000	3 700	512 000	1 700	29 000	2	24.8
CB63-500EU	500	1 540	1 008	592	80 000	4 700	640 000	1 700	30 000	1.5	28.8

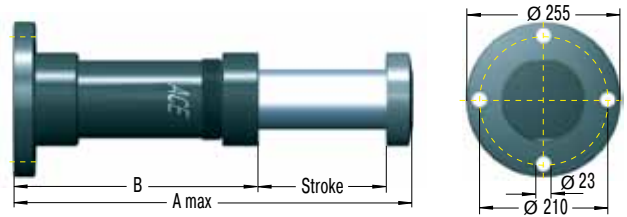
¹ The correct effective weight range for your application will be calculated by ACE and should fall within this band.

Special options: Special oils, special flanges, additional corrosion protection etc. available on request.

Front Flange -F



Rear Flange -R



Ordering Example

Safety Shock Absorber _____
 Bore Size Ø 100 mm _____
 Stroke 400 mm _____
 EU Compliant _____
 Mounting Style: Front Flange _____
 Identification No. assigned by ACE _____

CB100-400EU-F-X

Please indicate identification no. in case of replacement order

Complete Details Required when Ordering

Moving load m (kg)
 Impact velocity range v (m/s)max.
 Creep speed vs (m/s)
 Motor power P (kW)
 Stall torque factor ST (normal 2.5)
 Number of absorbers in parallel n

or technical data according to formulae and calculations on page 15 to 17.

The calculation and selection of the correct ACE safety shock absorber for your application should be referred to ACE for approval and assignment of unique identification number.

Technical Data

Reacting force Q: At max. capacity rating = **467 kN max.**

Rod return: Nitrogen accumulator (5.6 bar to 5.9 bar)

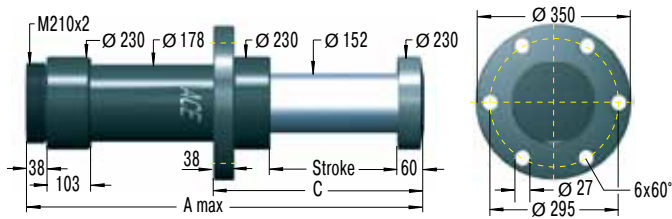
Dimensions and Capacity Chart

Type	Stroke mm	A max	B	C	Max. Energy Capacity W ₃ Nm/Cycle	1 Effective Weight me		Min. Return Force N	Max. Return Force N	Max. Side Load Angle °	Weight kg
						me min. kg	me max. kg				
CB100-200EU	200	735	495	320	80 000	6 900	640 000	4 500	44 000	4	58.6
CB100-300EU	300	1 005	665	420	120 000	10 300	960 000	4 500	56 000	3.5	70
CB100-400EU	400	1 275	835	520	160 000	13 800	1 280 000	4 500	65 000	3	82.5
CB100-500EU	500	1 545	1 005	620	200 000	17 200	1 600 000	4 500	71 000	2.5	67.5
CB100-600EU	600	1 815	1 175	720	240 000	20 700	1 920 000	4 500	76 000	2	75.8

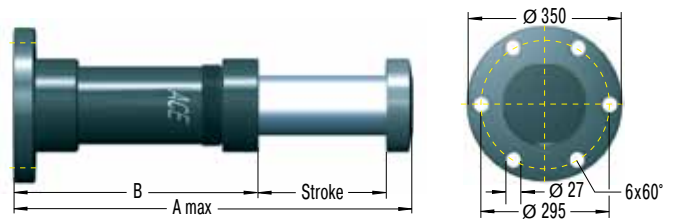
¹ The correct effective weight range for your application will be calculated by ACE and should fall within this band.

Special options: Special oils, special flanges, additional corrosion protection etc. available on request.

Front Flange -F



Rear Flange -R



Ordering Example

Safety Shock Absorber _____
 Bore Size Ø 160 mm _____
 Stroke 400 mm _____
 EU Compliant _____
 Mounting Style: Front Flange _____
 Identification No. assigned by ACE _____

CB160-400EU-F-X

Please indicate identification no. in case of replacement order

Complete Details Required when Ordering

Moving load _____ m (kg)
 Impact velocity range _____ v (m/s)max.
 Creep speed _____ vs (m/s)
 Motor power _____ P (kW)
 Stall torque factor _____ ST (normal 2.5)
 Number of absorbers in parallel _____ n

or technical data according to formulae and calculations on page 15 to 17.

The calculation and selection of the correct ACE safety shock absorber for your application should be referred to ACE for approval and assignment of unique identification number.

Technical Data

Reacting force Q: At max. capacity rating = **700 kN max.**

Rod return: Nitrogen accumulator (5.6 bar to 5.9 bar)

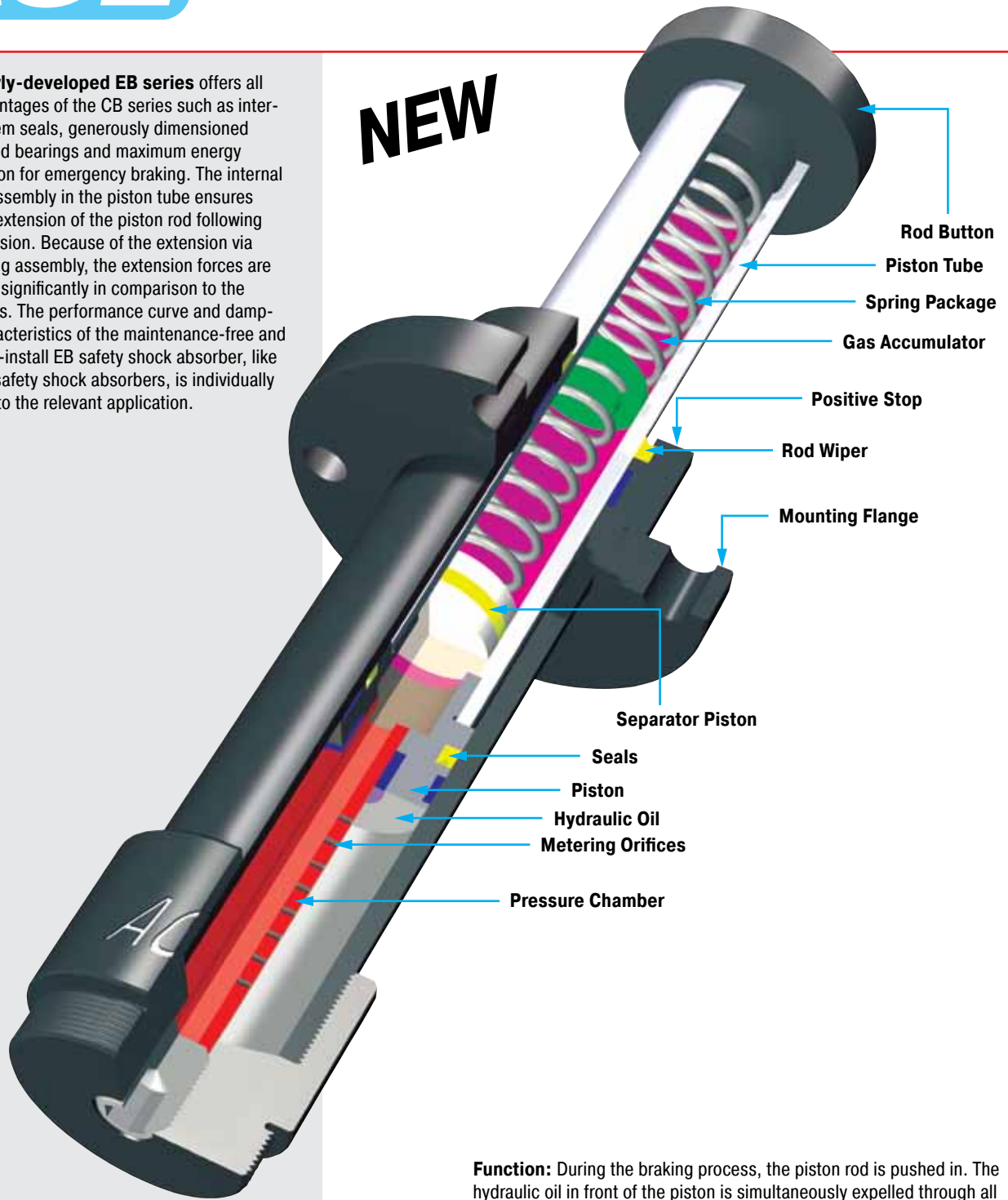
Dimensions and Capacity Chart

Type	Stroke mm	A max	B	C	Max. Energy Capacity W ₃ Nm/Cycle	1 Effective Weight me		Min. Return Force N	Max. Return Force N	Max. Side Load Angle °	Weight kg
						me min. kg	me max. kg				
CB160-400EU	400	1 400	940	600	240 000	22 700	1 920 000	11 000	71 000	4	154.6
CB160-600EU	600	2 000	1 340	800	360 000	34 000	2 880 000	11 000	71 000	3	188
CB160-800EU	800	2 600	1 740	1 000	480 000	45 400	3 840 000	11 000	71 000	2	221.3

¹ The correct effective weight range for your application will be calculated by ACE and should fall within this band.

Special options: Special oils, special flanges, additional corrosion protection etc. available on request.

The newly-developed EB series offers all the advantages of the CB series such as internal system seals, generously dimensioned piston rod bearings and maximum energy absorption for emergency braking. The internal spring assembly in the piston tube ensures reliable extension of the piston rod following compression. Because of the extension via the spring assembly, the extension forces are reduced significantly in comparison to the CB series. The performance curve and damping characteristics of the maintenance-free and ready-to-install EB safety shock absorber, like all ACE safety shock absorbers, is individually tailored to the relevant application.



Function: During the braking process, the piston rod is pushed in. The hydraulic oil in front of the piston is simultaneously expelled through all orifice openings. The number of orifice openings in effect reduces in proportion to the stroke movement. The retraction speed is reduced. The back-pressure created in front of the piston, and therefore the counterforce (Q), remain constant during the complete stroke. The oil volume displaced by the piston rod is compensated for by the separating piston. The piston rod is extended again by the spring assembly in the piston tube.

Impact velocity range:
0.5 to 4.6 m/s

Material: Steel body with black oxide finish. Piston rod hard chrome plated.

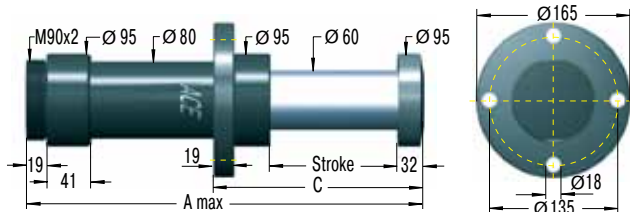
Operating temperature range:
-12 °C to 66 °C

Initial fill pressure: governs the rod return force.

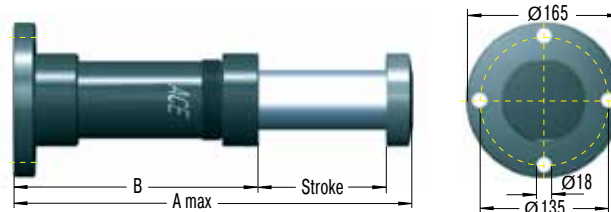
In creep speed: The shock absorber can be pushed through its stroke.



Front Flange -F



Rear Flange -R



Ordering Example

Safety Shock Absorber _____
 Bore Size Ø 63 mm _____
 Stroke 400 mm _____
 EU Compliant _____
 Mounting Style: Front Flange _____
 Identification No. assigned by ACE _____

EB63-400EU-F-X

Please indicate identification no. in case of replacement order

Complete Details Required when Ordering

Moving load _____ m (kg)
 Impact velocity range _____ v (m/s)max.
 Creep speed _____ vs (m/s)
 Motor power _____ P (kW)
 Stall torque factor _____ ST (normal 2.5)
 Number of absorbers in parallel _____ n

or technical data according to formulae and calculations on page 15 to 17.

The calculation and selection of the correct ACE safety shock absorber for your application should be referred to ACE for approval and assignment of unique identification number.

Technical Data

Reacting force Q: At max. capacity rating = **187 kN max.**

Rod return: Nitrogen accumulator (0.55 bar to 1.03 bar) combined with return spring

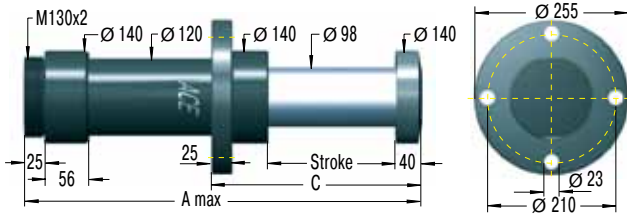
Dimensions and Capacity Chart

Type	Stroke mm	A max	B	C	Max. Energy Capacity W ₃ Nm/Cycle	1 Effective Weight me		Min. Return Force N	Max. Return Force N	Max. Side Load Angle °	Weight kg
						me min. kg	me max. kg				
EB63-100EU	100	420	288	192	16 000	900	128 000	700	6 900	3.5	13.7
EB63-200EU	200	700	468	292	32 000	1 800	256 000	770	9 300	3	16.7
EB63-300EU	300	980	648	392	48 000	2 700	384 000	830	10 600	2.5	21.8
EB63-400EU	400	1 260	828	492	64 000	3 700	512 000	600	11 100	2	25.8
EB63-500EU	500	1 540	1 008	592	80 000	4 700	640 000	670	12 000	1.5	29.8

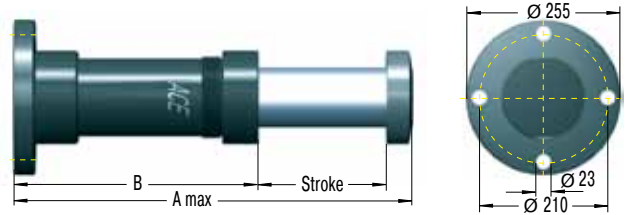
¹ The correct effective weight range for your application will be calculated by ACE and should fall within this band.

Special options: Special oils, special flanges, additional corrosion protection etc. available on request.

Front Flange -F



Rear Flange -R



80

Ordering Example

Safety Shock Absorber _____
 Bore Size \varnothing 100 mm _____
 Stroke 400 mm _____
 EU Compliant _____
 Mounting Style: Front Flange _____
 Identification No. assigned by ACE _____

EB100-400EU-F-X

Please indicate identification no. in case of replacement order

Complete Details Required when Ordering

Moving load m (kg)
 Impact velocity range v (m/s)max.
 Creep speed vs (m/s)
 Motor power P (kW)
 Stall torque factor ST (normal 2.5)
 Number of absorbers in parallel n

or technical data according to formulae and calculations on page 15 to 17.

The calculation and selection of the correct ACE safety shock absorber for your application should be referred to ACE for approval and assignment of unique identification number.

Technical Data

Reacting force Q: At max. capacity rating = **467 kN max.**

Rod return: Nitrogen accumulator (0.55 bar to 1.03 bar) combined with return spring

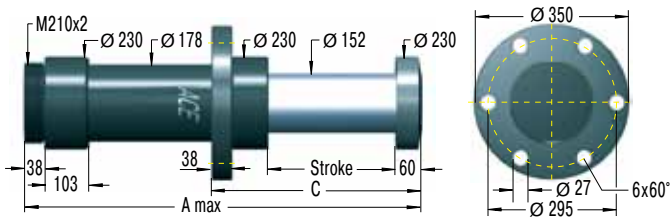
Dimensions and Capacity Chart

Type	Stroke mm	A max	B	C	Max. Energy Capacity W_0 Nm/Cycle	1 Effective Weight me		Min. Return Force N	Max. Return Force N	Max. Side Load Angle °	Weight kg
						me min. kg	me max. kg				
EB100-200EU	200	735	495	320	80 000	6 900	640 000	1 200	8 900	4	43.5
EB100-300EU	300	1 005	665	420	120 000	10 300	960 000	950	14 100	3.5	51.8
EB100-400EU	400	1 275	835	520	160 000	13 800	1 280 000	1 190	18 200	3	60.1
EB100-500EU	500	1 545	1 005	620	200 000	17 200	1 600 000	930	20 800	2.5	68.5
EB100-600EU	600	1 815	1 175	720	240 000	20 700	1 920 000	1 170	23 300	2	76.8

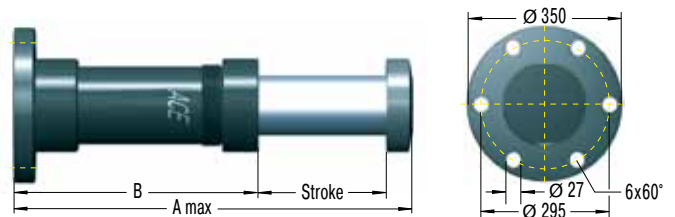
¹ The correct effective weight range for your application will be calculated by ACE and should fall within this band.

Special options: Special oils, special flanges, additional corrosion protection etc. available on request.

Front Flange -F



Rear Flange -R



Ordering Example

Safety Shock Absorber _____
 Bore Size Ø 160 mm _____
 Stroke 400 mm _____
 EU Compliant _____
 Mounting Style: Front Flange _____
 Identification No. assigned by ACE _____

EB160-400EU-F-X

Please indicate identification no. in case of replacement order

Complete Details Required when Ordering

Moving load m (kg)
 Impact velocity range v (m/s)max.
 Creep speed vs (m/s)
 Motor power P (kW)
 Stall torque factor ST (normal 2.5)
 Number of absorbers in parallel n

or technical data according to formulae and calculations on page 15 to 17.

Technical Data

Reacting force Q: At max. capacity rating = **700 kN max.**

Rod return: Nitrogen accumulator (0.55 bar to 1.03 bar) combined with return spring

Dimensions and Capacity Chart

Type	Stroke mm	A max	B	C	Max. Energy Capacity W ₃ Nm/Cycle	1 Effective Weight me		Min. Return Force N	Max. Return Force N	Max. Side Load Angle °	Weight kg
						me min. kg	me max. kg				
EB160-400EU	400	1 400	940	600	240 000	22 700	1 920 000	1 870	18 100	4	155.6
EB160-600EU	600	2 000	1 340	800	360 000	34 000	2 880 000	2 100	18 800	3	189
EB160-800EU	800	2 600	1 740	1 000	480 000	45 400	3 840 000	2 400	19 500	2	222.3

¹ The correct effective weight range for your application will be calculated by ACE and should fall within this band.

Special options: Special oils, special flanges, additional corrosion protection etc. available on request.

Permitted Use

ACE safety shock absorbers are machine elements to brake moving masses in a defined end position in emergency stop situations for axial forces. The safety shock absorbers are not designed for regular operational usage.

Calculation of safety shock absorbers

The calculation of safety shock absorbers should generally be performed or checked by ACE.

Deceleration Properties

The orifice sizing and drill pattern in the pressure chamber are individually designed for each safety shock absorber. The respective absorption characteristic is optimised corresponding to the maximum mass that occurs in the emergency stop and the impact speed. Correspondingly, each safety shock absorber is given an individual identification number.

Model Code

For types SCS33 to 64, the individual five-digit identification numbers can be taken from the last digits of the shock absorber model code shown on the label. Example: SCS33-50EUM-2XXXX. For type series SCS38 to SCS63, CB63 to CB160 and EB63 to EB160, the identification number is a five digit number. Example: SCS38-100F-XXXXX. In addition to the model code, the label also shows the authorised maximum impact velocity and maximum authorised impact mass for the unit.

Mounting

To mount the shock absorber, we recommend the use of original ACE mounting accessories shown in catalogue. The mounting of each shock absorber must be exactly positioned so that the reaction force (Q) can be adequately transmitted into the mounting structure. ACE recommends installation via the front flange -F mounting style that ensures the maximum protection against buckling. The damper must be mounted so that the moving loads are decelerated with the least possible side loading to the piston rod. The maximum permissible side load angles are detailed in our current catalogue. The entire stroke length must be used for deceleration because only using part of the stroke can lead to overstressing and damage to the unit.

Mounting style front flange -F



Safety Shock Absorber SCS

Safety Shock Absorber CB

Environmental Requirements

The permissible temperature range for each shock absorber type can be found in our current catalogue.

CAUTION: Usage outside the specified temperature range can lead to premature breakdown and damage of the shock absorbers which can then result in severe system damage or machine failures.

Trouble free operation outdoors or in damp environments is only warranted if the dampers are coated with a specific corrosion protection finish.

Initial Start-Up Checks

First impacts on the shock absorber should only be tried after correctly mounting and with reduced impact speeds and – if possible – with reduced load. Differences between calculated and actual operating data can then be detected early on, and damage to your system can be avoided. If the shock absorbers were selected on calculated data that does not correspond to the maximum possible loading (i.e. selection based on drive power being switched off or at reduced impact speed) then these restricted impact conditions must not be exceeded during initial testing or subsequent use of the system. Otherwise you risk damaging the shock absorbers and/or your machine by overstressing materials. After the initial trial check that the piston rod fully extends again and that there are no signs of oil leakage. Also check that the mounting hardware is still securely tightened. You need to satisfy yourself that no damage has occurred to the piston rod, the body, or the mounting hardware.

Fixed Mechanical Stop

Safety shock absorbers do not need an external stop as a stroke limiter. The stroke of the safety absorber is limited by the stop of the impact head on the shock absorber. For types SCS33 to SCS64, the fixed stop point is achieved with the integrated stop collar.

What Needs to be Checked after a Full Load Impact?

Safety shock absorbers that were originally checked only at reduced speed or load need to be checked again after a full load impact (i.e. emergency use) has occurred. Check that the piston rod fully extends to its full out position, that there are no signs of oil leakage and that the mounting hardware is still securely fixed. You need to satisfy yourself that no damage has occurred to the piston rod, the body, or the mounting hardware. If no damage has occurred, the safety shock absorber can be put back into normal operation (see **initial start-up**).

Maintenance

Safety shock absorbers are sealed systems and do not need special maintenance. Safety shock absorbers that are not used regularly (i.e. that are intended for emergency stop systems) should be checked within the normal time frame for safety checks, but **at least once a year**. At this time special attention must be paid to checking that the piston rod resets to its fully extended position, that there is no oil leakage and that the mounting brackets are still secure and undamaged. The piston rod must not show any signs of damage. Safety shock absorbers that are **in use regularly** should be checked **every three months**.

Repair Notice

If any damage to the shock absorber is detected or if there are any doubts as to the proper functioning of the unit please send the unit for service to ACE. Alternatively contact your local ACE office for further advice.

Detailed information on the above listed points can be taken from the corresponding operating and assembly instructions.