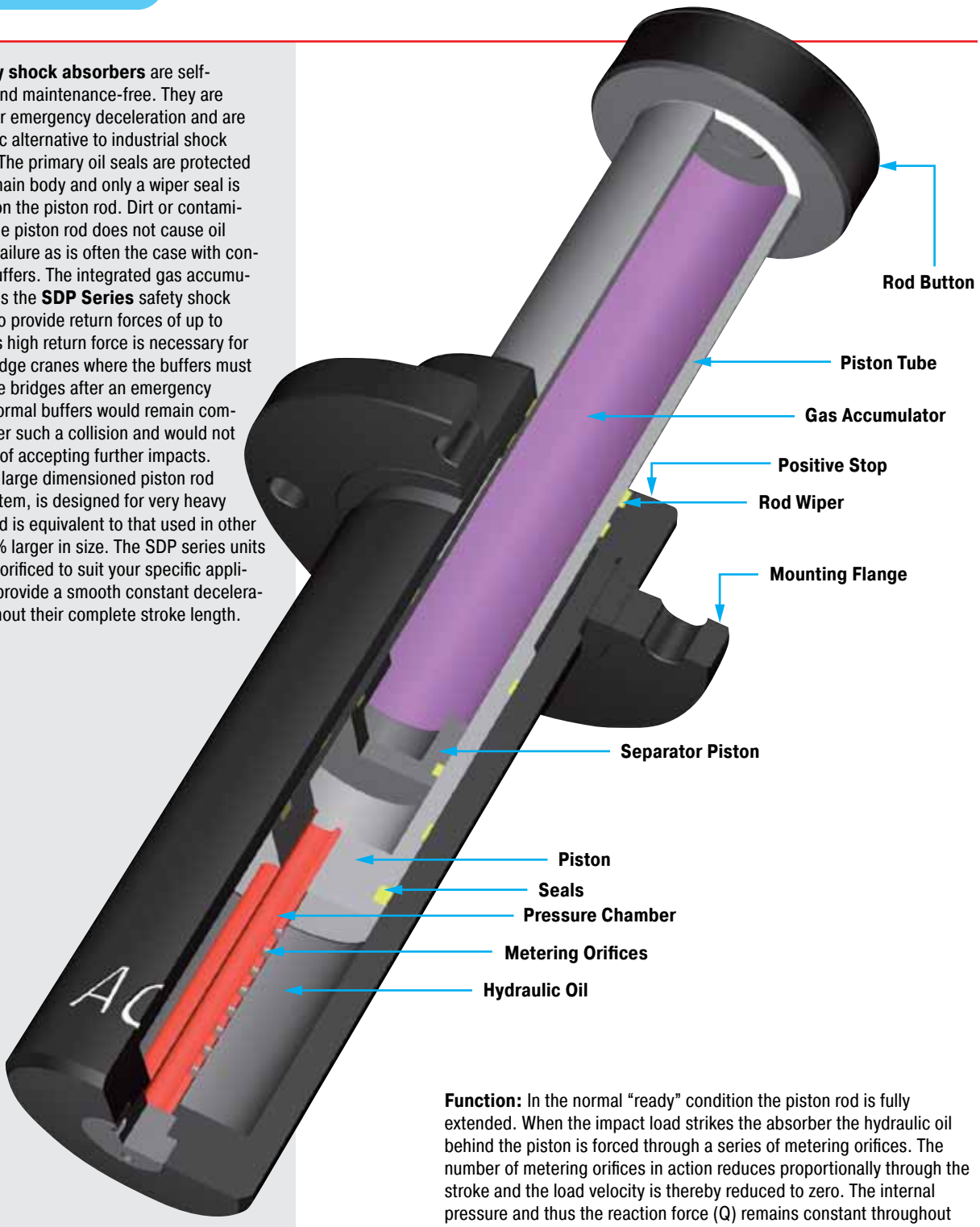
Safety Shock Absorbers SDP63 to SDP160

For Crane Installations

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 **SDP Series** safety shock absorbers to provide return forces of up to 110 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 SDP 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: Shock absorber body: Painted steel (RAL 7024). Piston rod: Hard chrome plated.

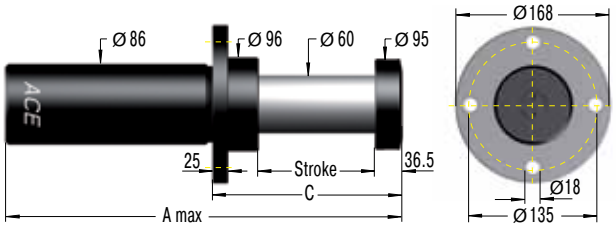
Operating temperature range:
-20 °C to 60 °C

Initial fill pressure: governs the rod return force.

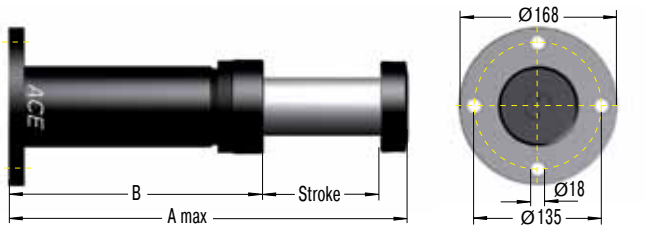
In creep speed: The shock absorber can be pushed through its stroke.

Issue 1.2013 Specifications subject to change

Front Flange -F



Rear Flange -R



Ordering Example **SDP63-400EU-F-XXXXX**

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

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 13 to 15.

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 = **200 kN max.**

Rod return: Nitrogen accumulator (5 bar)

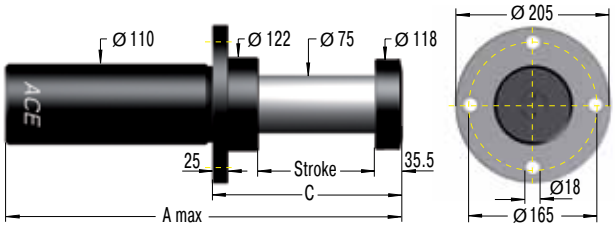
Dimensions and Capacity Chart

Type	Stroke mm	A max	B	C	Max. Energy Capacity W_3 Nm/Cycle	Min. Return Force N	Max. Return Force N	Mounting Style F Max. Side Load Angle °	Mounting Style R Max. Side Load Angle °	Weight kg
SDP63-50EU	50	280	193.5	145	9 100	1 500	8 000	5	4.5	11
SDP63-75EU	75	360	248.5	170	13 600	1 500	10 000	4.6	4	12.5
SDP63-100EU	100	425	288.5	195	18 200	1 500	11 000	4.2	3.5	14
SDP63-150EU	150	560	373.5	245	27 300	1 500	15 000	3.2	2.4	17
SDP63-200EU	200	700	463.5	295	36 400	1 500	17 000	2.6	2	19
SDP63-250EU	250	840	553.5	345	43 200	1 500	18 000	2.4	1.8	21
SDP63-300EU	300	980	643.5	395	49 100	1 500	20 000	2.2	1.6	24
SDP63-400EU	400	1 265	828.5	495	54 500	1 500	20 000	2	1.4	29
SDP63-500EU	500	1 555	1 018.5	595	59 100	1 500	20 000	1.6	1.2	34
SDP63-600EU	600	1 840	1 203.5	695	60 000	1 500	20 000	1.4	1	39

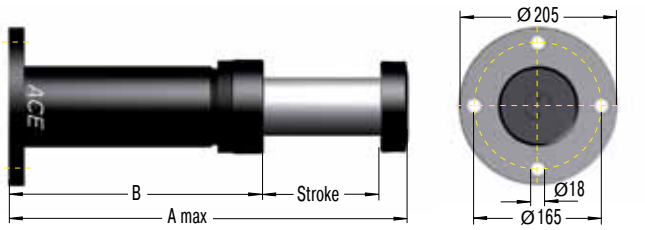
Special options: Special oils, special flanges, additional corrosion protection etc. available on request.

Issue 1.2013 Specifications subject to change

Front Flange -F



Rear Flange -R



Ordering Example **SDP80-200EU-F-XXXXX**

Safety Shock Absorber
Bore Size Ø 80 mm
Stroke 200 mm
EU Compliant
Mounting Style: Front Flange
Identification No. assigned by ACE

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 13 to 15.

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 = **260 kN max.**

Rod return: Nitrogen accumulator (5 bar)

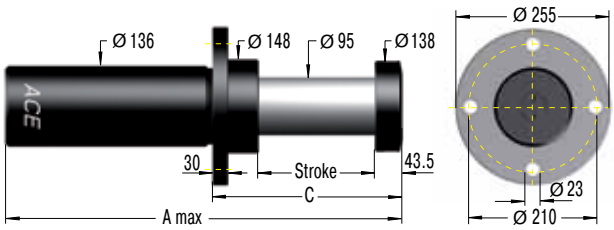
Dimensions and Capacity Chart

Type	Stroke mm	A max	B	C	Max. Energy Capacity W_3 Nm/Cycle	Min. Return Force N	Max. Return Force N	Mounting Style F Max. Side Load Angle °	Mounting Style R Max. Side Load Angle °	Weight kg
SDP80-50EU	50	285	199.5	155	11 800	2 500	16 000	6	5	19
SDP80-100EU	100	440	304.5	205	23 600	2 500	16 000	5	4	23
SDP80-150EU	150	580	394.5	255	35 500	2 500	20 000	4.5	3.5	27
SDP80-200EU	200	730	494.5	305	47 300	2 500	20 000	4	2.5	32
SDP80-250EU	250	865	579.5	355	56 800	2 500	25 000	3.5	2.5	35
SDP80-300EU	300	1 010	674.5	405	65 500	2 500	25 000	3	2	39
SDP80-400EU	400	1 285	849.5	505	80 000	2 500	30 000	2	1.3	47
SDP80-500EU	500	1 575	1 039.5	605	90 900	2 500	30 000	1.5	1	55
SDP80-600EU	600	1 865	1 229.5	705	98 200	2 500	30 000	1.3	0.8	64
SDP80-800EU	800	2 450	1 614.5	905	101 800	2 500	30 000	0.8	0.6	80

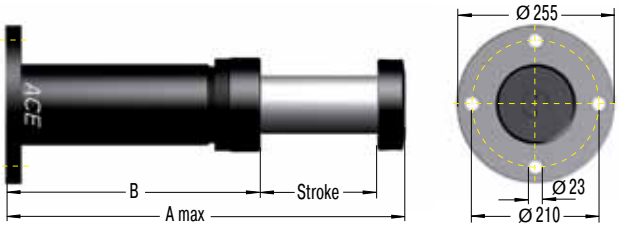
Special options: Special oils, special flanges, additional corrosion protection etc. available on request.

Issue 1.2013 Specifications subject to change

Front Flange -F



Rear Flange -R



Ordering Example **SDP100-400EU-F-XXXXX**

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

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 13 to 15.

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 = **520 kN max.**

Rod return: Nitrogen accumulator (5 bar)

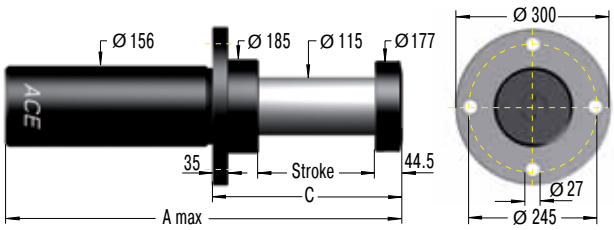
Dimensions and Capacity Chart

Type	Stroke mm	A max	B	C	Max. Energy Capacity W_3 Nm/Cycle	Min. Return Force N	Max. Return Force N	Mounting Style F Max. Side Load Angle °	Mounting Style R Max. Side Load Angle °	Weight kg
SDP100-100EU	100	460	316.5	230	47 000	3 900	38 000	5	4.5	38
SDP100-200EU	200	750	506.5	330	95 000	3 900	38 000	4.5	4	53
SDP100-250EU	250	890	596.5	380	114 000	3 900	40 000	4	3.5	59
SDP100-300EU	300	1 035	691.5	430	131 000	3 900	40 000	3.5	3	66
SDP100-400EU	400	1 325	881.5	530	160 000	3 900	40 000	2.5	2	81
SDP100-500EU	500	1 610	1 066.5	630	182 000	3 900	40 000	2	1.7	93
SDP100-600EU	600	1 880	1 236.5	730	196 000	3 900	46 000	1.7	1.5	103
SDP100-800EU	800	2 450	1 606.5	930	218 000	3 900	46 000	1.3	1	125
SDP100-1000EU	1 000	3 020	1 976.5	1 130	236 000	3 900	46 000	0.8	0.6	160

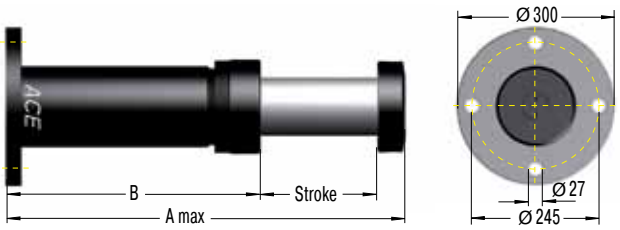
Special options: Special oils, special flanges, additional corrosion protection etc. available on request.

Issue 1.2013 Specifications subject to change

Front Flange -F



Rear Flange -R



Ordering Example **SDP120-800EU-F-XXXXX**

Safety Shock Absorber
Bore Size Ø 120 mm
Stroke 800 mm
EU Compliant
Mounting Style: Front Flange
Identification No. assigned by ACE

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 13 to 15.

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 bar)

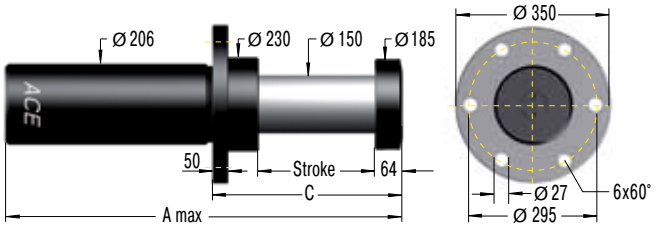
Dimensions and Capacity Chart

Type	Stroke mm	A max	B	C	Max. Energy Capacity W_3 Nm/Cycle	Min. Return Force N	Max. Return Force N	Mounting Style F Max. Side Load Angle °	Mounting Style R Max. Side Load Angle °	Weight kg
SDP120-100EU	100	460	315.5	249	64 000	5 600	35 000	5	4.5	58
SDP120-200EU	200	750	505.5	355	127 000	5 600	70 000	4.5	3.5	72
SDP120-400EU	400	1 325	880.5	555	236 000	5 600	75 000	2.7	1.7	99
SDP120-600EU	600	1 880	1 235.5	755	300 000	5 600	75 000	2.3	1.3	125
SDP120-800EU	800	2 450	1 605.5	955	327 000	5 600	75 000	1.7	0.9	160
SDP120-1000EU	1 000	3 020	1 975.5	1 155	364 000	5 600	75 000	1.3	0.7	192
SDP120-1200EU	1 200	3 590	2 345.5	1 355	436 000	5 600	75 000	1	0.6	225

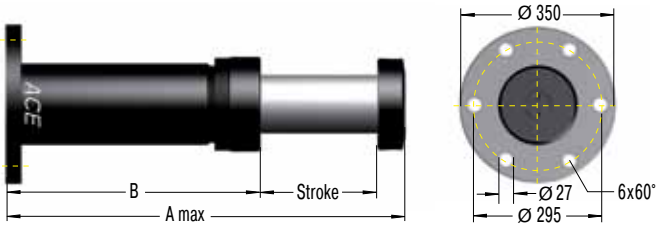
Special options: Special oils, special flanges, additional corrosion protection etc. available on request.

Issue 1.2013 Specifications subject to change

Front Flange -F



Rear Flange -R



Ordering Example **SDP160-400EU-F-XXXXX**

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

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 13 to 15.

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 = **1000 kN max.**

Rod return: Nitrogen accumulator (5 bar)

Dimensions and Capacity Chart

Type	Stroke mm	A max	B	C	Max. Energy Capacity W_3 Nm/Cycle	Min. Return Force N	Max. Return Force N	Mounting Style F Max. Side Load Angle °	Mounting Style R Max. Side Load Angle °	Weight kg
SDP160-200EU	200	860	596	440	182 000	1 000	80 000	6	5	105
SDP160-400EU	400	1 485	1 021	640	345 000	1 000	80 000	5	4	165
SDP160-500EU	500	1 765	1 201	740	409 000	1 000	90 000	4.5	3.5	195
SDP160-600EU	600	2 065	1 401	840	469 000	1 000	95 000	4	3	230
SDP160-800EU	800	2 660	1 796	1 040	545 000	1 000	100 000	3	2	290
SDP160-1000EU	1000	3 225	2 161	1 240	545 000	1 000	110 000	2.3	1.3	350
SDP160-1200EU	1200	3 815	2 551	1 440	545 000	1 000	110 000	1.7	0.8	410
SDP160-1600EU	1600	4 995	3 331	1 840	582 000	1 000	110 000	1.5	0.6	530

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

Issue 1.2013 Specifications subject to change

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: SCS33-50EU-1XXXX. For type series SDH38 to SDH63 and SDP63 to SDP160, the identification number is a five digit number. Example: SDH38-100EU-F-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 permissable 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 SDH

Safety Shock Absorber SDP

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 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.

Issue 1.2013 Specifications subject to change