

SCS38 to SCS63 Safety Shock Absorbers

Low reacting forces with long strokes

High rack damper, optimised characteristic

Energy capacity 3,600 Nm/cycle to 216,000 Nm/cycle

Stroke 50 mm to 1,200 mm

SCS38EU

SCS50EU

SCS63EU

The identification numbers listed are the respective standard units of the corresponding shock absorber series. Special types can have deviating identification numbers.

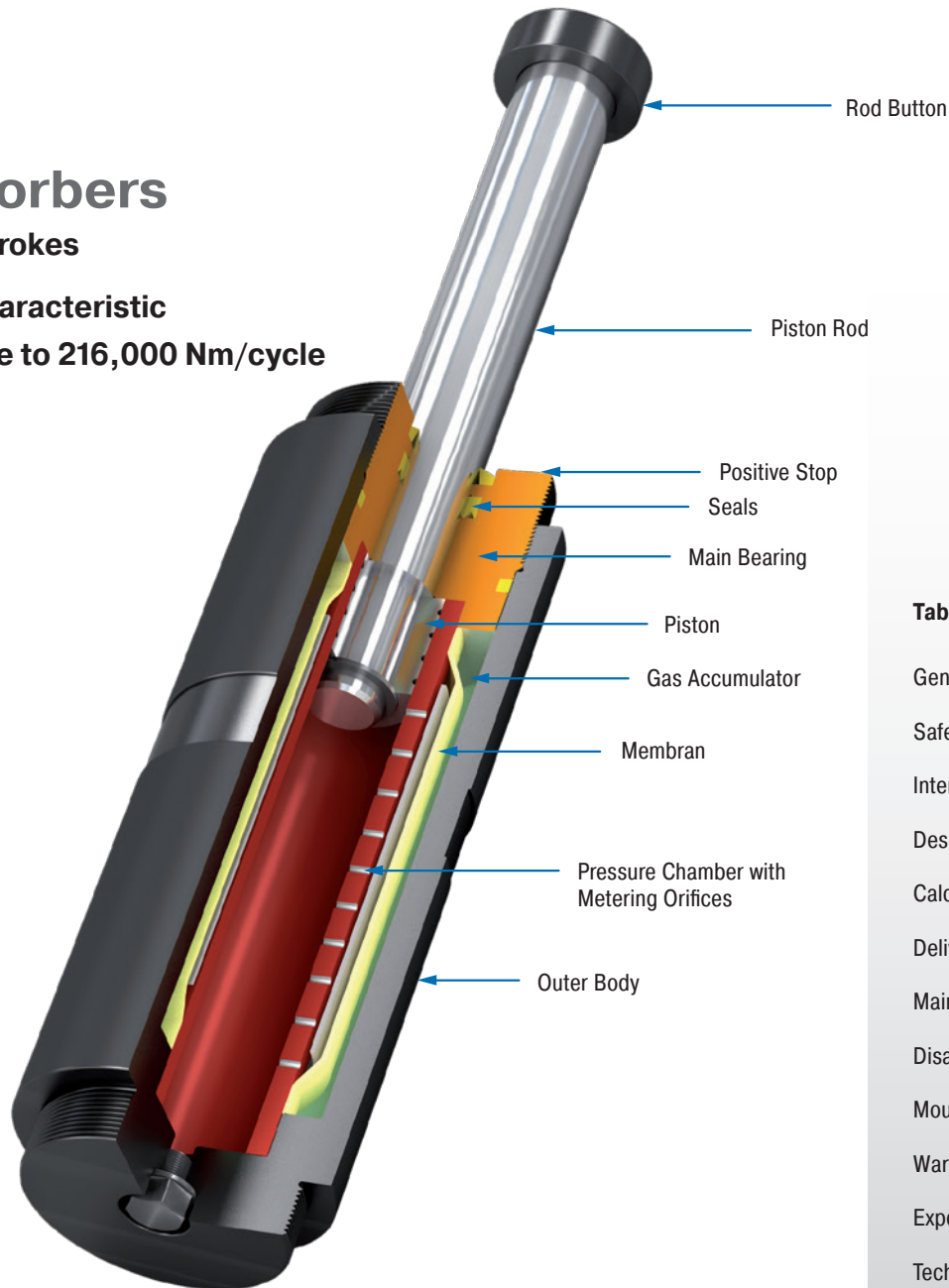


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General instructions

This manual is for the disruption-free use of the product types listed on page 1; its compliance is a prerequisite for the fulfilment of any warranty claims.

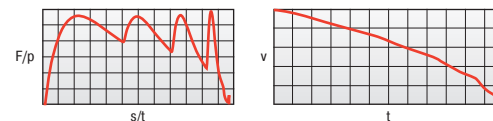
Therefore, make sure to read this manual before use.

Please always maintain the specified limits from the performance table (technical data). Take into account the predominant environmental conditions and restrictions.

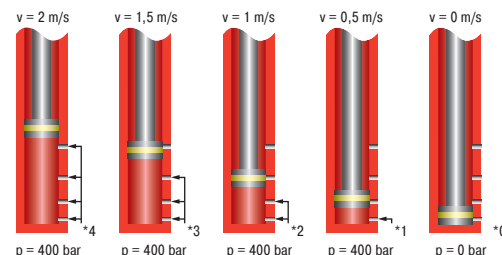
Note the regulations of the trade association, TÜV or corresponding national, international and European regulations. Installation and commissioning only according to mounting instructions.

constant deceleration is the correct calculation of the safety shock absorber and therefore the correct selection of the right throttle bore pattern or the correct hardness level of the shock absorber.

General Function



F = Force (N) p = Internal pressure (bar) s = Stroke (m)
t = Deceleration time (s) v = Velocity (m/s)



* The load velocity reduces continuously as you travel through the stroke due to the reduction in the number of metering orifices (*) in action. The internal pressure remains essentially constant and thus the Force vs. stroke curve remains linear.

Safety information

WARNING

- ⚠ If ACE safety shock absorbers are used where a failure of the product could lead to personal injuries and/or material damage, additional safety elements must be implemented.
- ⚠ Free-moving masses can lead to injuries by crushing during installation of the shock absorber. Secure moving masses against inadvertent starting with suitable safety precautions before installing the shock absorbers.

Intended 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.

Description and function

The ACE safety shock absorbers SCS38 to SCS63 are maintenance-free, ready-to-install, hydraulic elements with a number of throttle openings.

In the braking process, the moving mass drives the piston rod with kinetic energy, and possibly with additional drive energy, in an axial direction with the defined impact speed against the impact head on the shock absorber. As an alternative, several shock absorbers can be used in parallel. In the braking procedure used, the piston rod is pushed into the shock absorber. The hydraulic oil in front of the piston is forced through all throttle bores at the same time. The number of effective throttle openings reduces proportional to the driven stroke. The moving speed reduces.

The dynamic pressure in front of the piston corresponds with the counterforce applied by the shock absorber and remains almost constant throughout the whole stroke. A prerequisite for a

Calculation and design

In order to guarantee the long life time of the safety shock absorber it must be correctly calculated and dimensioned.

For that the following parameters must be considered:

- > moving mass [kg]
- > impact velocity of moving mass onto the shock absorber [m/s]
- > additional acting propelling force, motor power or propelling torque [N, kW, Nm]
- > number of parallel acting shock absorbers [n]
- > number of strokes or cycles per hour [1/h]

The correct dimensioning of safety shock absorbers can be made with the ACE online calculation program at www.ace-ace.com.

Alternatively the filled out online form may be sent to us via E-Mail. Or call our free of charge calculation service:

+49 (0)2173-9226-20.

WARNING

- ⚠ The shock absorbers have to be dimensioned in such a way that the calculated values do not exceed the maximum values of the individual capacity chart (see Technical Data):
W3 [Nm/stroke]
effective weight me
max. side load angle [°]
- ⚠ The calculation and selection of the correct ACE safety shock absorber for your application should be referred to ACE for approval and assignment of a unique identification number.
- ⚠ To correctly calculate the safety shock absorber it must be the only emergency braking system.

Delivery and storage

- > Please check the shock absorber for any damage upon delivery.
- > The shock absorbers can suffer damage if allowed to fall. Please remove the shock absorbers carefully from the packaging.
- > Shock absorbers can generally be stored in any position.
- > Storage in the original packaging is recommended.
- > Always store shock absorbers in a dry place to avoid oxidation.
- > The maximum recommended storage time is three years.

Maintenance and care

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**.

Disassembly and disposal

Ensure that the shock absorbers are dealt with under consideration of environmental protection (problematic substance utilisation).

The SCS38 to SCS63 safety shock absorbers are filled with Automatic Transmission Fluid (ATF) oil. You can request the corresponding data sheets for the respective type.

The SCS38 to SCS63 safety shock absorbers are repairable. Defective absorbers can be sent to our services department to establish the cause of failure.

Mounting instructions and mounting accessories

Mounting instructions

Prior to installation and use, check if the identification number on the shock absorber or on the package corresponds to the number on the delivery sheet. Industrial shock absorbers are maintenance-free and ready-to-fit.

Operating temperature range: -12 °C to 60 °C

Mounting: In any position, but always so that the complete stroke can be used. The shock absorber is to be mounted so that the forces can be guided centrally via the piston rod. The maximum permissible side load may not be exceeded.

Safety shock absorbers may not be transferred from one application place to another if the application characteristics are not identical. Contact ACE if in any doubt.

Emergency stop application: After an emergency impact has occurred, the safety shock absorber must be checked for the proper rod return, the seal tightness and the fastening of mounting elements.

Damage to the piston rod, outer body, or to the mounts should be inspected and considered for replacement or refurbishment.

Regular start up: Safety shock absorbers may be operated with the 60% stroke in creep speed at 1/10 of the maximum impact velocity.

Inspection: An inspection should be carried out not less than every **three months**.

WARNING

Please check that the customer specific inner tube ID number at the end of the shock absorber description and number on the delivery note match exactly. The application data on the safety shock absorbers label, such as moving masses and the max. impact velocity, must be matched with the technical calculation by ACE. This check is important to make sure that the damper is correctly calculated for the application. Otherwise damage to the machine or safety shock absorbers can occur due to overload.

The gas accumulators on safety shock absorbers from the SCS38 to SCS63 series are filled with nitrogen in the factory. The corresponding filling pressure (2 to 2.2 bar) can be taken from the absorber label. The absorbers may only be operated with this filling pressure. A reduced filling pressure can lead to major malfunctions.

Moving masses can lead to injuries or bodily harm when installing the shock absorber. Secure moving masses against accidental movement.

The shock absorbers may be unsuitable for the application and show insufficient damping performance. Check for proper suitability of shock absorber.

When operating outside the allowed temperature range, the shock absorber may lose its function. Permissible temperature range must be adhered to. Do not paint the shock absorber due to heat radiation.

Ambient fluids, gases and dirt particles may affect or damage the sealing system and lead to failure of the shock absorber. Piston rods and sealing systems must be protected against foreign substances.

Damage to the piston rod surface may destroy the sealing system. Do not grease, oil, etc. the piston rod and protect it from dirt particles.

The piston rod can be torn out of the shock absorber. Do not put tensile stress on the piston rod.

WARNING

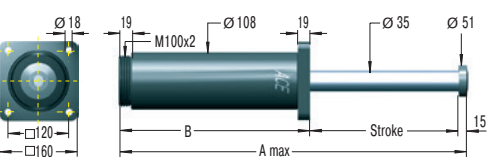
Shock absorbers can break away on impact. The assembly has to be dimensioned in a way that the maximum forces can be absorbed.

Check the following points after hitting the safety shock absorber in an emergency: complete rod return, seal tightness and screw connection of mounting elements.

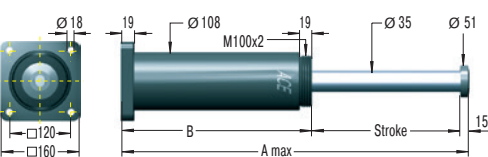
Initial Start-up Checks

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.

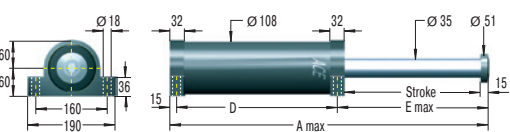
SCS38-F Front Flange



SCS38-R Rear Flange



SCS38-S Foot Mount



Fastening

The screw connection for fastening the flanges must always be designed by the customer. In the case of foot mounting, an additional support strip is required to support the damper force. This support strip (max. thickness 9 mm) is preferably positioned behind the rear foot flange. The support strip prevents the fixing screws of the damper from being subjected to bending and shearing. The customer must design, manufacture and install the fastening of the support strip (welding, screw fastening, etc.) on site.

Accessories

When using accessories and mounting elements, pay attention to the separate mounting instructions for accessories.

Disposal of packaging

Dispose of packaging in an environmentally safe manner. The recycling of packaging saves raw materials and lowers the amount of waste. The used packaging materials do not contain illegal substances.

Performance and Dimensions

TYPES	Energy capacity Nm/cycle	Return Force min. N	Return Force max. N	Stroke mm	A max. mm	B mm	D mm	E max. mm	Mounting Style		Mounting Style	
									¹ F and S Side Load Angle max. °	¹ R Side Load Angle max. °	F and R Weight kg	S Weight kg
SCS38-50EU	3,600	600	700	50	270	205	175	80	5.0	4.0	12.0	13.0
SCS38-100EU	7,200	600	700	100	370	255	225	132	5.0	4.0	14.0	15.0
SCS38-150EU	10,800	600	700	150	470	305	275	180	5.0	4.0	16.0	17.0
SCS38-200EU	14,400	600	700	200	570	355	325	230	5.0	4.0	18.0	19.0
SCS38-250EU	18,000	600	700	250	670	405	375	280	4.7	3.7	20.0	21.0
SCS38-300EU	21,600	600	700	300	785	470	440	330	3.9	2.9	22.0	22.0
SCS38-350EU	25,200	600	700	350	885	520	490	380	3.4	2.4	24.0	25.0
SCS38-400EU	28,800	600	700	400	1,000	585	555	430	3.0	2.0	26.0	27.0
SCS38-500EU	36,000	600	700	500	1,215	700	670	530	2.4	1.4	30.0	31.0
SCS38-600EU	43,200	600	700	600	1,430	815	785	630	1.9	0.9	34.0	34.0
SCS38-700EU	50,400	600	700	700	1,645	930	900	730	1.6	0.6	38.0	39.0
SCS38-800EU	57,600	600	700	800	1,860	1,045	1,015	830	1.3	0.3	43.0	44.0

¹ The values are reduced by 20 % at max. side load angle.

Mounting instructions and mounting accessories

Mounting instructions

Prior to installation and use, check if the identification number on the shock absorber or on the package corresponds to the number on the delivery sheet. Industrial shock absorbers are maintenance-free and ready-to-fit.

Operating temperature range: -12 °C to 60 °C

Mounting: In any position, but always so that the complete stroke can be used. The shock absorber is to be mounted so that the forces can be guided centrally via the piston rod. The maximum permissible side load may not be exceeded.

Safety shock absorbers may not be transferred from one application place to another if the application characteristics are not identical. Contact ACE if in any doubt.

Emergency stop application: After an emergency impact has occurred, the safety shock absorber must be checked for the proper rod return, the seal tightness and the fastening of mounting elements.

Damage to the piston rod, outer body, or to the mounts should be inspected and considered for replacement or refurbishment.

Regular start up: Safety shock absorbers may be operated with the 60% stroke in creep speed at 1/10 of the maximum impact velocity.

Inspection: An inspection should be carried out not less than every three months.

WARNING

Shock absorbers can break away on impact. The assembly has to be dimensioned in a way that the maximum forces can be absorbed.

Check the following points after hitting the safety shock absorber in an emergency: complete rod return, seal tightness and screw connection of mounting elements.

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.

WARNING

Please check that the customer specific inner tube ID number at the end of the shock absorber description and number on the delivery note match exactly. The application data on the safety shock absorbers label, such as moving masses and the max. impact velocity, must be matched with the technical calculation by ACE. This check is important to make sure that the damper is correctly calculated for the application. Otherwise damage to the machine or safety shock absorbers can occur due to overload.

The gas accumulators on safety shock absorbers from the SCS38 to SCS63 series are filled with nitrogen in the factory. The corresponding filling pressure (2 to 2.2 bar) can be taken from the absorber label. The absorbers may only be operated with this filling pressure. A reduced filling pressure can lead to major malfunctions.

Moving masses can lead to injuries or bodily harm when installing the shock absorber. Secure moving masses against accidental movement.

The shock absorbers may be unsuitable for the application and show insufficient damping performance. Check for proper suitability of shock absorber.

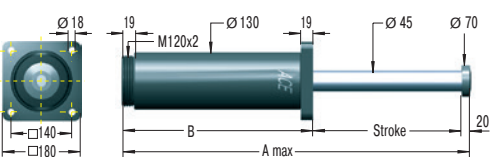
When operating outside the allowed temperature range, the shock absorber may lose its function. Permissible temperature range must be adhered to. Do not paint the shock absorber due to heat radiation.

Ambient fluids, gases and dirt particles may affect or damage the sealing system and lead to failure of the shock absorber. Piston rods and sealing systems must be protected against foreign substances.

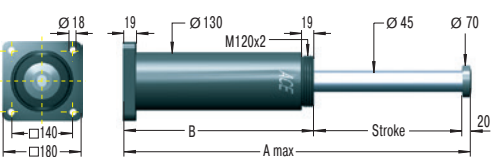
Damage to the piston rod surface may destroy the sealing system. Do not grease, oil, etc. the piston rod and protect it from dirt particles.

The piston rod can be torn out of the shock absorber. Do not put tensile stress on the piston rod.

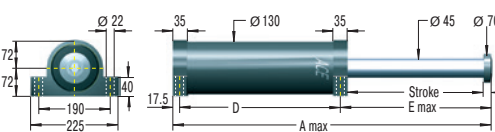
SCS50-F Front Flange



SCS50-R Rear Flange



SCS50-S Foot Mount



Fastening

The screw connection for fastening the flanges must always be designed by the customer. In the case of foot mounting, an additional support strip is required to support the damper force. This support strip (max. thickness 11 mm) is preferably positioned behind the rear foot flange. The support strip prevents the fixing screws of the damper from being subjected to bending and shearing. The customer must design, manufacture and install the fastening of the support strip (welding, screw fastening, etc.) on site.

Accessories

When using accessories and mounting elements, pay attention to the separate mounting instructions for accessories.

Disposal of packaging

Dispose of packaging in an environmentally safe manner. The recycling of packaging saves raw materials and lowers the amount of waste. The used packaging materials do not contain illegal substances.

Performance and Dimensions

TYPES	Energy capacity Nm/cycle	Return Force min. N	Return Force max. N	Stroke mm	A max. mm	B mm	D mm	E max. mm	Mounting Style		Mounting Style	
									¹ F and S Side Load Angle max. °	¹ R Side Load Angle max. °	F and R Weight kg	S Weight kg
SCS50-100EU	14,000	1,000	1,200	100	390	270	235	138	5.0	4.0	22.0	23.0
SCS50-150EU	21,000	1,000	1,200	150	490	320	285	188	5.0	4.0	25.0	26.0
SCS50-200EU	28,000	1,000	1,200	200	590	370	335	238	5.0	4.0	27.0	28.0
SCS50-250EU	35,000	1,000	1,200	250	690	420	385	288	4.5	3.5	30.0	31.0
SCS50-300EU	42,000	1,000	1,200	300	805	485	450	338	3.8	2.8	33.0	34.0
SCS50-350EU	49,000	1,000	1,200	350	905	535	500	388	3.3	2.3	35.0	37.0
SCS50-400EU	56,000	1,000	1,200	400	1,020	600	565	438	2.9	1.9	38.0	40.0
SCS50-500EU	70,000	1,000	1,200	500	1,235	715	680	538	2.3	1.3	44.0	45.0
SCS50-600EU	84,000	1,000	1,200	600	1,450	830	795	638	1.9	0.9	50.0	51.0
SCS50-700EU	98,000	1,000	1,200	700	1,665	945	910	738	1.6	0.6	55.0	57.0
SCS50-800EU	112,000	1,000	1,200	800	1,880	1,060	1,025	838	1.3	0.3	61.0	63.0
SCS50-1000EU	140,000	1,000	1,200	1,000	2,310	1,290	1,255	1,038	1.0	0.0	72.0	74.0

¹ The values are reduced by 20 % at max. side load angle.

Mounting instructions and mounting accessories

Mounting instructions

Prior to installation and use, check if the identification number on the shock absorber or on the package corresponds to the number on the delivery sheet. Industrial shock absorbers are maintenance-free and ready-to-fit.

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

Mounting: In any position, but always so that the complete stroke can be used. The shock absorber is to be mounted so that the forces can be guided centrally via the piston rod. The maximum permissible side load may not be exceeded.

Safety shock absorbers may not be transferred from one application place to another if the application characteristics are not identical. Contact ACE if in any doubt.

Emergency stop application: After an emergency impact has occurred, the safety shock absorber must be checked for the proper rod return, the seal tightness and the fastening of mounting elements.

Damage to the piston rod, outer body, or to the mounts should be inspected and considered for replacement or refurbishment.

Regular start up: Safety shock absorbers may be operated with the 60% stroke in creep speed at 1/10 of the maximum impact velocity.

Inspection: An inspection should be carried out not less than every three months.

WARNING

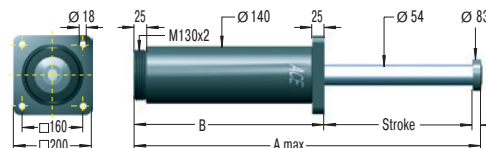
Shock absorbers can break away on impact. The assembly has to be dimensioned in a way that the maximum forces can be absorbed.

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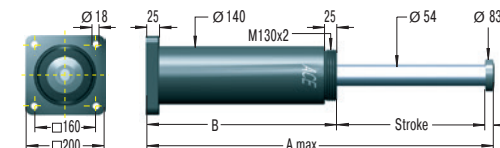
Initial Start-up Checks

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.

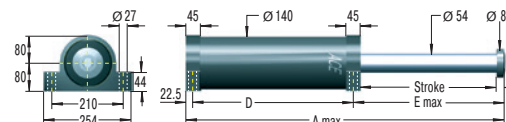
SCS63-F Front Flange



SCS63-R Rear Flange



SCS63-S Foot Mount



Fastening

The screw connection for fastening the flanges must always be designed by the customer. In the case of foot mounting, an additional support strip is required to support the damper force. This support strip (max. thickness 14 mm) is preferably positioned behind the rear foot flange. The support strip prevents the fixing screws of the damper from being subjected to bending and shearing. The customer must design, manufacture and install the fastening of the support strip (welding, screw fastening, etc.) on site.

Accessories

When using accessories and mounting elements, pay attention to the separate mounting instructions for accessories.

Disposal of packaging

Dispose of packaging in an environmentally safe manner. The recycling of packaging saves raw materials and lowers the amount of waste. The used packaging materials do not contain illegal substances.

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- The shock absorbers may be unsuitable for the application and show insufficient damping performance. Check for proper suitability of shock absorber.
- When operating outside the allowed temperature range, the shock absorber may lose its function. Permissible temperature range must be adhered to. Do not paint the shock absorber due to heat radiation.
- Ambient fluids, gases and dirt particles may affect or damage the sealing system and lead to failure of the shock absorber. Piston rods and sealing systems must be protected against foreign substances.
- Damage to the piston rod surface may destroy the sealing system. Do not grease, oil, etc. the piston rod and protect it from dirt particles.
- The piston rod can be torn out of the shock absorber. Do not put tensile stress on the piston rod.

Performance and Dimensions

TYPES	Energy capacity Nm/cycle	Return Force min. N	Return Force max. N	Stroke mm	A max. mm	B mm	D mm	E max. mm	Mounting Style		Mounting Style	
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SCS63-150EU	27,000	1,500	2,500	150	505	335	290	193	5.0	4.0	32.0	35.0
SCS63-200EU	36,000	1,500	2,500	200	605	385	340	243	5.0	4.0	35.0	38.0
SCS63-250EU	45,000	1,500	2,500	250	705	435	390	293	5.0	4.0	38.0	42.0
SCS63-300EU	54,000	1,500	2,500	300	805	485	440	343	5.0	4.0	41.0	45.0
SCS63-350EU	63,000	1,500	2,500	350	925	555	510	393	5.0	4.0	45.0	49.0
SCS63-400EU	72,000	1,500	2,500	400	1,025	605	560	443	5.0	4.0	48.0	52.0
SCS63-500EU	90,000	1,500	2,500	500	1,245	725	680	543	4.2	3.2	55.0	60.0
SCS63-600EU	108,000	1,500	2,500	600	1,445	825	780	643	3.4	2.4	62.0	66.0
SCS63-700EU	126,000	1,500	2,500	700	1,665	945	900	746	2.9	1.9	69.0	73.0
SCS63-800EU	144,000	1,500	2,500	800	1,865	1,045	1,000	843	2.5	1.5	75.0	79.0
SCS63-1000EU	180,000	1,500	2,500	1,000	2,285	1,265	1,220	1,043	1.9	0.9	89.0	93.0
SCS63-1200EU	216,000	1,500	2,500	1,200	2,705	1,485	1,440	1,243	1.4	0.4	102.0	106.0

¹ The values are reduced by 20 % at max. side load angle.

Manual

Warranty

Fundamentally, all modifications to the product by third parties lead to exclusion from the warranty.

Obvious defects must be reported to the vendor in writing immediately after delivery, no later than one week, but in any case before processing or installation, otherwise the assertion of a warranty claim is excluded. A timely dispatch is sufficient to keep the term.

The vendor is to be given an opportunity to check on site. If the complaint is justified the vendor offers warranty by repair or replacement at its own discretion. If the rectification fails, the buyer may choose to demand reduction of payment or cancellation of the contract. If there is only a minor lack of conformity, particularly with only minor defects, the buyer nevertheless has a right of withdrawal.

If, after failed rectification, the buyer chooses to cancel the contract due to a defect of title or material defect, they are not entitled to additionally claim for damages.

If, after failed fulfilment, the buyer chooses compensation, the goods remain with the buyer, if this is reasonable. The compensation is limited to the difference between the purchase price and the value of the defective item. This does not apply if the vendor maliciously causes the breach of contract.

The quality of the goods is only considered as agreed upon with the product description of the vendor. Public statements, claims or advertising of the manufacturer do not represent an additional contractual specification of quality of the goods.

If the buyer receives defective mounting instructions, the buyer is only obligated to deliver defect-free mounting instructions and only if the defect to the mounting instructions prevents proper mounting.

The warranty period is two years and begins upon completion. Exchange and return of custom products are fundamentally excluded. The factory conditions of the manufacturing factory apply to parts not manufactured and processed by the vendor, which can be viewed by the orderer at the vendor at any time. Construction and installation parts are delivered according to the present standard of engineering.

Service life

In general, safety dampers are machine elements that are designed for emergency stop applications.

Safety shock absorbers can be started up with 100 % stroke utilisation with a creep speed of 1/10 of the maximum impact velocity. The propelling force must be greater than the return force.

Starting at creep speed subjects the sealing elements of the safety dampers to wear. The wear of seals is largely dependent upon the operating conditions and the respective application and its operating parameters.

Technical Data

Energy capacity: 3,600 Nm/Cycle to 216,000 Nm/Cycle

Impact velocity range: SCS38-50-800EU: **0.90 m/s to 4.6 m/s**
SCS50-100-1000EU: **0.61 m/s to 4.6 m/s**
SCS63-100-1200EU: **0.50 m/s to 4.6 m/s**

Reacting force: At max. capacity rating = 80 kN to 210 kN

Operating temperature range: -20 °C to 60 °C. Other temperatures on request.

Mounting: In any position

Positive stop: Integrated

Material: Outer body, Rod end button: Steel corrosion-resistant coating; Piston rod: Hard chrome plated steel

Damping medium: Automatic Transmission Fluid (ATF)

Filling pressure: Approx. 2 bar. Rod return by integrated nitrogen accumulator.

Application field: Shelf storage systems, Heavy load applications, Conveyor systems, Conveyor systems, Portal systems, Test stations

Note: For creep speed applications, please consult ACE.

On request: Special oils, special flanges, additional corrosion protection etc.

Integrated rod sensor for indicating the complete extension of the piston rod. Type normally closed or normally open, option PNP or NPN switch.