ACE
A STABILUS COMPANY

SDH38 to SDH63
Safety Shock Absorbers

Low reacting forces with long strokes

High rack damper, optimised characteristic

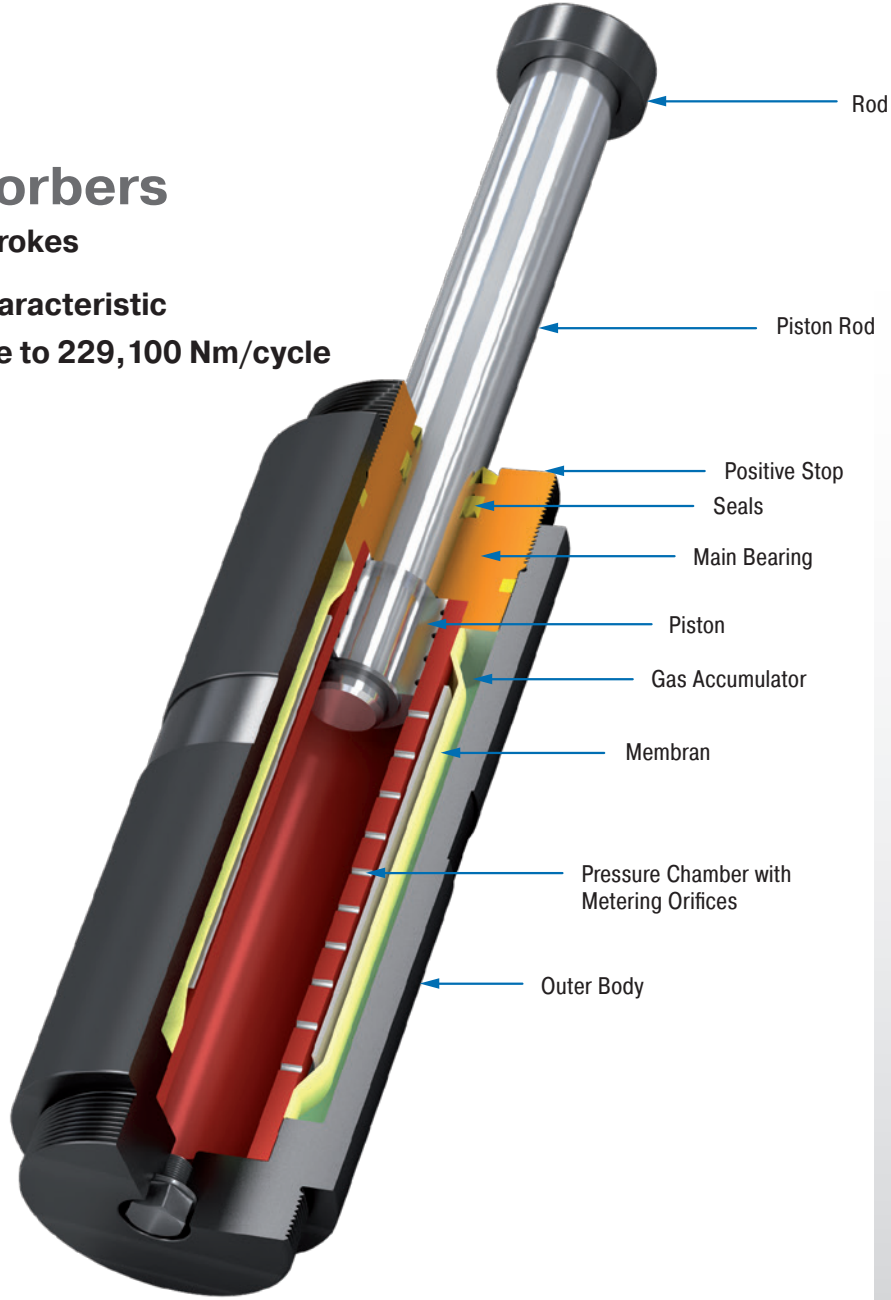
Energy capacity 3,600 Nm/cycle to 229,100 Nm/cycle

Stroke 50 mm to 800 mm

SDH38EU

SDH50EU

SDH63EU



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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Safety Shock Absorbers SDH38 to SDH63 (high rack damper, optimised characteristic)

Manual

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.

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.

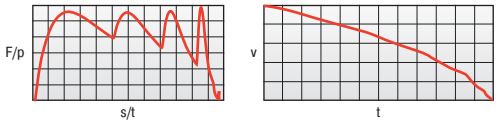
Intended use

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.

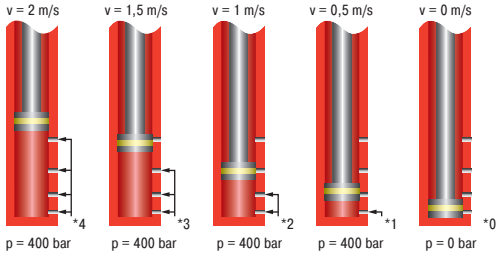
Description and function

The ACE safety shock absorbers SDH38 to SDH63 are maintenance-free, ready-to-install hydraulic components with numerous metering orifices. During the slowing down process the moving mass moves with kinetic energy and, if necessary, an additional drive energy in the axial direction of the piston rod with a defined impact velocity against the rod end button of the shock absorber. Alternatively, numerous shock absorbers can also be used in parallel. During the initiated slowing down process the piston rod is pushed into the shock absorber. The hydraulic oil located before the piston is displaced through all metering orifices at the same time. The number of effective metering openings reduces in proportion to the driven stroke. The retraction speed reduces. The dynamic pressure applied in front of the piston corresponds to the counterforce applied by the shock absorber and remains approximately constant over the entire stroke. A requirement for a constant rate of deceleration is the correct calculation of the safety shock absorber and therefore the correct selection of the right metering orifice pattern or the right 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.

Calculation and design

In order to ensure an optimum, fault-free and durable function of the safety shock absorbers they must be correctly dimensioned and designed. The following parameters must be known and used in the calculation:

- Moving mass [kg]
- Impact velocity of the mass into the shock absorber(s) [m/s]
- Additionally acting propelling force, propelling power or propelling torque [N, kW, Nm]
- Number of shock absorbers acting in parallel [n]
- Number of strokes or cycles per hour [1/h]

The correct size of the safety shock absorbers can be determined with the ACE online calculation programme at www.ace-ace.de. You can also send us the completed online form via e-mail for checking.

Or make use of our free calculation service by phoning: +49 (0)2173 - 9226-20.

WARNING

The dampers must be dimensioned in such a way that the calculated values do not exceed the maximum values of the respective performance table (technical data):

W_3 [Nm/cycle]

Effective weight me

Max. side load angle [°]

The calculation and design of the suitable safety shock absorber should be undertaken by or checked by ACE.

For a correct damping design the safety shock absorber must represent the only braking system in an emergency stop.

Delivery and storage

- After delivery please check the shock absorber for any damage.
- The shock absorber can become damaged if it falls. Carefully remove shock absorber from the packaging.
- Shock absorbers can generally be stored in any position.
- Storage in the original packaging is preferred.
- Always store shock absorbers in a dry place in order to avoid oxidation.
- The recommended maximum storage time is three years.

Maintenance and care

Safety shock absorbers are enclosed systems and therefore do not need special maintenance. Safety shock absorbers that are not regularly started up (e.g. emergency stop devices) are checked **at least once per year** as part of the normal safety check of the plant. Check that the return of the piston rod is in the initial position, the damper is not leaking and the mounting elements are properly secured. The piston rod must not exhibit any damage. For safety shock absorbers that are regularly operated, these checks should take place at intervals of no more than three months.

Disassembly and disposal

Take account of environmental protection (recovery of problematic substances) during disposal of the shock absorber. The SDH38 to SDH63 safety shock absorbers are filled with HLP 46. The corresponding data sheet is available on request.

The SDH38 to SDH63 safety shock absorbers are repairable. Faulty dampers can be sent to our service department for determination of the cause of failure.

Safety Shock Absorbers SDH38 (high rack damper, optimised characteristic)

Mounting instructions and mounting accessories

Installation instructions

Before installation and use check whether the identification number on the damper or on the packaging matches the respective designation on the delivery note.

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

Mounting: As required but always in such a way that the entire damper stroke is used. The dampers must always be mounted in such a way that the forces are introduced centrally over the piston rod in the damper. The maximum side load angle must not be exceeded. Safety dampers must not be exchanged from one installation site to another if the conformity of the throttle characteristic curve is not ensured.

WARNING

Take particular care that the customer-specific identification number at the end of the damper designation matches the number on the delivery note. The field data to be read from the type plate, such as moving mass and maximum impact velocity, must be compared with the technical design. This ensures that the damper is the right size for its use. Otherwise you risk damaging the shock absorbers and/or machine by overstressing materials.

The gas accumulators of the SDH38 to SDH63 safety shock absorbers are filled with nitrogen ex works. The respective filling pressure (5 bar) can be found on the damper label. The dampers may only be operated with this filling pressure. A reduced filling pressure can lead to serious malfunctions.

During installation of the dampers, moving masses can lead to injuries due to inadvertent starting. Secure moving masses against inadvertent moving.

The dampers may be unsuitable for use and have an insufficient damping effect. Check the specific suitability of the dampers before installation.

If operated outside of the operating temperature range, the damper can lose its function. Operating temperature range must be maintained. Do not paint dampers due to heat emission.

Fluids, gases and dirt particles in the surrounding area can attack or destroy the seal system of the damper and cause it to fail. Protect or encapsulate piston rod and seal system from external materials in the surrounding area.

Damage to the piston rod surface can destroy the seal system. Do not grease, oil piston rod etc. and protect against dirt particles.

The piston rod can be torn from the damper. Do not load the piston rod with tensile stress.

Damper can tear off upon impact. Always lay out the connection structure in such a way that the maximum occurring forces can be absorbed with sufficient safety.

Safety shock absorber check after a damper impact. Check that the piston rod returns to the initial position, the damper is not leaking and the mounting elements are properly secured.

Emergency stop application: After an emergency stop, check that the piston rod returns to the initial position, the damper is not leaking and the mounting elements are properly secured. Make sure that no damage has occurred to the piston rod, the body, or the mounting hardware.

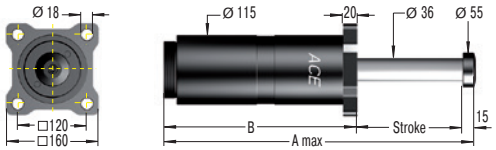
Regular start-up: Safety shock absorbers can be regularly started up with 100 % stroke utilisation with a creep speed of 1/10 of the max. impact velocity.

Checking: A regular check should take place at an interval of **no more than three months**.

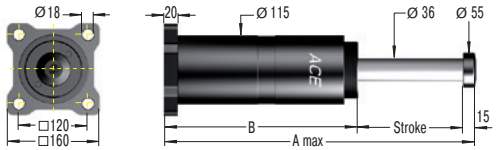
Commissioning

First impacts on the shock absorber should only be tried after correctly mounting and with reduced impact velocity and – if possible – with reduced load. Differences between calculated and actual operating data can then be detected early on, and damage to the system can be avoided. If the safety dampers 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 velocity) 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 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. Make sure that no damage has occurred to the piston rod, the body, or the mounting hardware.

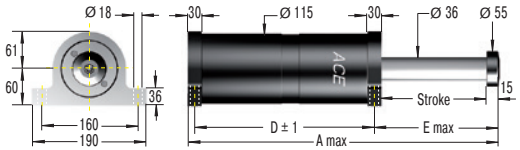
SDH38-F Front Flange



SDH38-R Rear Flange



SDH38-S Foot Mount



Mounting accessories

If using accessory parts and mounting elements, note the respective separate mounting instructions for accessories.

Packaging disposal

Please dispose of the transportation packaging in an environmentally-friendly manner. Recycling packaging materials saves raw materials and reduces waste. The packaging materials do not contain any prohibited materials.

Performance data and dimensions

TYPES	[1] Energy capacity Nm/cycle	[1] Reacting force N	Return Force min. N	Return Force max. N	Stroke mm	A max. mm	B mm	D mm	E max. mm	Mounting type F and R Weight kg	Mounting type S Weight kg
SDH38-50EU	3,600	80,000	600	700	50	270	204	165	84	14.0	13.7
SDH38-100EU	7,300	80,000	600	700	100	370	254	215	134	15.5	15.7
SDH38-150EU	10,900	80,000	600	700	150	470	304	265	184	17.0	17.2
SDH38-200EU	14,500	80,000	600	700	200	585	369	330	234	20.0	19.7
SDH38-250EU	18,200	80,000	600	700	250	685	419	380	284	22.0	21.7
SDH38-300EU	21,800	80,000	600	700	300	800	484	445	334	24.0	23.7
SDH38-350EU	25,500	80,000	600	700	350	900	534	495	384	26.0	25.7
SDH38-400EU	29,100	80,000	600	700	400	1,015	599	560	434	28.0	28.2
SDH38-500EU	36,400	80,000	600	700	500	1,230	714	675	534	32.0	32.2
SDH38-600EU	43,600	80,000	600	700	600	1,445	829	790	634	36.0	36.2
SDH38-700EU	50,900	80,000	600	700	700	1,660	944	905	734	40.0	40.2
SDH38-800EU	58,200	80,000	600	700	800	1,875	1,059	1,020	834	44.0	44.2

[1] The values apply to mounting style Front Flange and Foot Mounting. For mounting style Rear Flange, please consult ACE.
In case of an existing side load angle, please consult ACE.

Safety Shock Absorbers SDH50 (high rack damper, optimised characteristic)

Mounting instructions and mounting accessories

Installation instructions

Before installation and use check whether the identification number on the damper or on the packaging matches the respective designation on the delivery note.

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

Mounting: As required but always in such a way that the entire damper stroke is used. The dampers must always be mounted in such a way that the forces are introduced centrally over the piston rod in the damper. The maximum side load angle must not be exceeded. Safety dampers must not be exchanged from one installation site to another if the conformity of the throttle characteristic curve is not ensured.

WARNING

Take particular care that the customer-specific identification number at the end of the damper designation matches the number on the delivery note. The field data to be read from the type plate, such as moving mass and maximum impact velocity, must be compared with the technical design. This ensures that the damper is the right size for its use. Otherwise you risk damaging the shock absorbers and/or machine by overstressing materials.

The gas accumulators of the SDH38 to SDH63 safety shock absorbers are filled with nitrogen ex works. The respective filling pressure (5 bar) can be found on the damper label. The dampers may only be operated with this filling pressure. A reduced filling pressure can lead to serious malfunctions.

During installation of the dampers, moving masses can lead to injuries due to inadvertent starting. Secure moving masses against inadvertent moving.

The dampers may be unsuitable for use and have an insufficient damping effect. Check the specific suitability of the dampers before installation.

If operated outside of the operating temperature range, the damper can lose its function. Operating temperature range must be maintained. Do not paint dampers due to heat emission.

Fluids, gases and dirt particles in the surrounding area can attack or destroy the seal system of the damper and cause it to fail. Protect or encapsulate piston rod and seal system from external materials in the surrounding area.

Damage to the piston rod surface can destroy the seal system. Do not grease, oil piston rod etc. and protect against dirt particles.

The piston rod can be torn from the damper. Do not load the piston rod with tensile stress.

Damper can tear off upon impact. Always lay out the connection structure in such a way that the maximum occurring forces can be absorbed with sufficient safety.

Safety shock absorber check after a damper impact. Check that the piston rod returns to the initial position, the damper is not leaking and the mounting elements are properly secured.

Emergency stop application: After an emergency stop, check that the piston rod returns to the initial position, the damper is not leaking and the mounting elements are properly secured. Make sure that no damage has occurred to the piston rod, the body, or the mounting hardware.

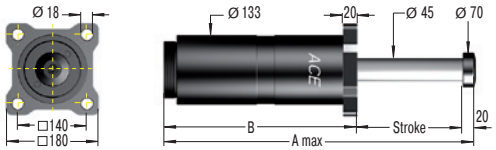
Regular start-up: Safety shock absorbers can be regularly started up with 100 % stroke utilisation with a creep speed of 1/10 of the max. impact velocity.

Checking: A regular check should take place at an interval of **no more than three months**.

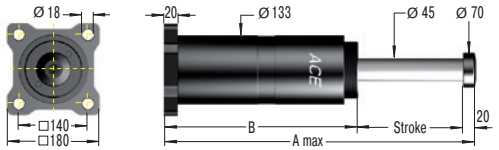
Commissioning

First impacts on the shock absorber should only be tried after correctly mounting and with reduced impact velocity and – if possible – with reduced load. Differences between calculated and actual operating data can then be detected early on, and damage to the system can be avoided. If the safety dampers 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 velocity) 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 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. Make sure that no damage has occurred to the piston rod, the body, or the mounting hardware.

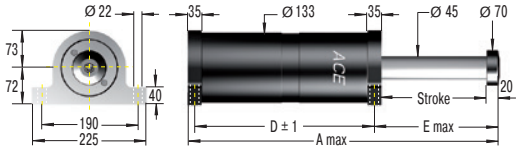
SDH50-F Front Flange



SDH50-R Rear Flange



SDH50-S Foot Mount



Mounting accessories

If using accessory parts and mounting elements, note the respective separate mounting instructions for accessories.

Packaging disposal

Please dispose of the transportation packaging in an environmentally-friendly manner. Recycling packaging materials saves raw materials and reduces waste. The packaging materials do not contain any prohibited materials.

Performance data and dimensions

TYPES	[1] Energy capacity Nm/cycle	[1] Reacting force N	Return Force min. N	Return Force max. N	Stroke mm	A max. mm	B mm	D mm	E max. mm	Mounting type: F and R Weight kg	Mounting type: S Weight kg
SDH50-100EU	14,500	160,000	1,000	1,200	100	416	297	258	139	23.5	25.0
SDH50-150EU	21,800	160,000	1,000	1,200	150	516	347	308	189	26.0	27.5
SDH50-200EU	29,100	160,000	1,000	1,200	200	616	397	358	239	28.5	30.0
SDH50-250EU	36,400	160,000	1,000	1,200	250	731	462	423	289	32.0	33.5
SDH50-300EU	43,600	160,000	1,000	1,200	300	831	512	473	339	34.5	36.0
SDH50-350EU	50,900	160,000	1,000	1,200	350	931	562	523	389	37.0	38.5
SDH50-400EU	58,200	160,000	1,000	1,200	400	1,046	627	588	439	40.0	41.5
SDH50-500EU	72,700	160,000	1,000	1,200	500	1,261	742	703	539	46.0	47.5
SDH50-600EU	87,300	160,000	1,000	1,200	600	1,476	857	818	639	52.0	53.5
SDH50-700EU	101,800	160,000	1,000	1,200	700	1,691	972	933	739	58.0	59.5
SDH50-800EU	116,400	160,000	1,000	1,200	800	1,906	1,087	1,048	839	64.0	65.5
SDH50-1000EU	145,500	160,000	1,000	1,200	1,000	2,336	1,317	1,278	1,039	75.0	76.5

[1] The values apply to mounting style Front Flange and Foot Mounting. For mounting style Rear Flange, please consult ACE.
In case of an existing side load angle, please consult ACE.

Safety Shock Absorbers SDH63 (high rack damper, optimised characteristic)

Mounting instructions and mounting accessories

Installation instructions

Before installation and use check whether the identification number on the damper or on the packaging matches the respective designation on the delivery note.

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

Mounting: As required but always in such a way that the entire damper stroke is used. The dampers must always be mounted in such a way that the forces are introduced centrally over the piston rod in the damper. The maximum side load angle must not be exceeded. Safety dampers must not be exchanged from one installation site to another if the conformity of the throttle characteristic curve is not ensured.

WARNING

Take particular care that the customer-specific identification number at the end of the damper designation matches the number on the delivery note. The field data to be read from the type plate, such as moving mass and maximum impact velocity, must be compared with the technical design. This ensures that the damper is the right size for its use. Otherwise you risk damaging the shock absorbers and/or machine by overstressing materials.

The gas accumulators of the SDH38 to SDH63 safety shock absorbers are filled with nitrogen ex works. The respective filling pressure (5 bar) can be found on the damper label. The dampers may only be operated with this filling pressure. A reduced filling pressure can lead to serious malfunctions.

During installation of the dampers, moving masses can lead to injuries due to inadvertent starting. Secure moving masses against inadvertent moving.

The dampers may be unsuitable for use and have an insufficient damping effect. Check the specific suitability of the dampers before installation.

If operated outside of the operating temperature range, the damper can lose its function. Operating temperature range must be maintained. Do not paint dampers due to heat emission.

Fluids, gases and dirt particles in the surrounding area can attack or destroy the seal system of the damper and cause it to fail. Protect or encapsulate piston rod and seal system from external materials in the surrounding area.

Damage to the piston rod surface can destroy the seal system. Do not grease, oil piston rod etc. and protect against dirt particles.

The piston rod can be torn from the damper. Do not load the piston rod with tensile stress.

Damper can tear off upon impact. Always lay out the connection structure in such a way that the maximum occurring forces can be absorbed with sufficient safety.

Safety shock absorber check after a damper impact. Check that the piston rod returns to the initial position, the damper is not leaking and the mounting elements are properly secured.

Emergency stop application: After an emergency stop, check that the piston rod returns to the initial position, the damper is not leaking and the mounting elements are properly secured. Make sure that no damage has occurred to the piston rod, the body, or the mounting hardware.

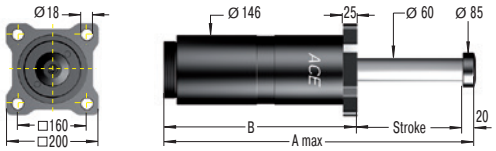
Regular start-up: Safety shock absorbers can be regularly started up with 100 % stroke utilisation with a creep speed of 1/10 of the max. impact velocity.

Checking: A regular check should take place at an interval of **no more than three months**.

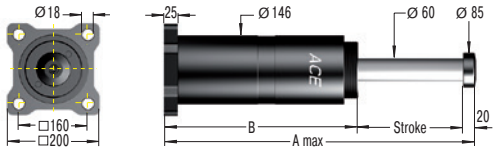
Commissioning

First impacts on the shock absorber should only be tried after correctly mounting and with reduced impact velocity and – if possible – with reduced load. Differences between calculated and actual operating data can then be detected early on, and damage to the system can be avoided. If the safety dampers 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 velocity) 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 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. Make sure that no damage has occurred to the piston rod, the body, or the mounting hardware.

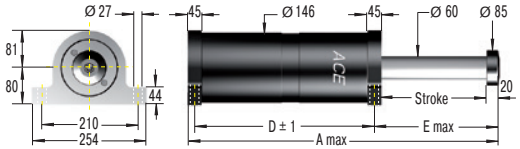
SDH63-F Front Flange



SDH63-R Rear Flange



SDH63-S Foot Mount



Mounting accessories

If using accessory parts and mounting elements, note the respective separate mounting instructions for accessories.

Packaging disposal

Please dispose of the transportation packaging in an environmentally-friendly manner. Recycling packaging materials saves raw materials and reduces waste. The packaging materials do not contain any prohibited materials.

Performance data and dimensions

TYPES	[1] Energy capacity Nm/cycle	[1] Reacting force N	Return Force min. N	Return Force max. N	Stroke mm	A max. mm	B mm	D mm	E max. mm	Mounting type: F and R Weight kg	Mounting type: S Weight kg
SDH63-100EU	19,100	210,000	1,500	2,500	100	420	301	252	144	32	35
SDH63-150EU	28,600	210,000	1,500	2,500	150	520	351	302	194	35	38
SDH63-200EU	38,200	210,000	1,500	2,500	200	620	401	352	244	39	42
SDH63-250EU	47,700	210,000	1,500	2,500	250	720	451	402	294	43	46
SDH63-300EU	57,300	210,000	1,500	2,500	300	850	531	482	344	48	51
SDH63-350EU	66,800	210,000	1,500	2,500	350	950	581	532	394	52	55
SDH63-400EU	76,400	210,000	1,500	2,500	400	1,080	661	612	444	60	63
SDH63-500EU	95,500	210,000	1,500	2,500	500	1,280	761	712	544	68	71
SDH63-600EU	114,500	210,000	1,500	2,500	600	1,510	891	842	644	78	81
SDH63-700EU	133,600	210,000	1,500	2,500	700	1,740	1,021	972	744	88	91
SDH63-800EU	152,700	210,000	1,500	2,500	800	1,970	1,151	1,102	844	98	101
SDH63-1000EU	190,900	210,000	1,500	2,500	1,000	2,430	1,411	1,362	1,044	118	121
SDH63-1200EU	229,100	210,000	1,500	2,500	1,200	2,890	1,671	1,622	1,244	138	141

[1] The values apply to mounting style Front Flange and Foot Mounting. For mounting style Rear Flange, please consult ACE.
In case of an existing side load angle, please consult ACE.

Safety Shock Absorbers SDH38 to SDH63 (high rack damper, optimised characteristic)

ACE
A STABILUS COMPANY

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 229,100 Nm/cycle

Impact velocity range: SDH38-50 to SDH38-800: **0.9 m/s to 4.6 m/s**
SDH50-100 to SDH50-1000: **0.6 m/s to 4.6 m/s**
SDH63-100 to SDH63-1200: **0.5 m/s to 4.6 m/s**
Other speeds on request.

Reacting force: At max. energy capacity = 51 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: Painted steel;
Piston rod: Hard chrome plated steel
Piston rod seal: NBR
Rod end button: Steel with black oxide finish and hardened

Damping medium: HLP 46

Filling pressure: Approx. 5 bar. Rod return by integrated nitrogen accumulator.

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

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.