



Operating manual for descender and rescue lifting device SafEscape



SD 72
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1. General information

The descender and rescue lifting device is used to rescue persons who have met with an accident when working at a height or underground.

The descender and rescue lifting device is not a fall arrester!

Every user of the descender and rescue lifting device must read and understand this manual before using the system.

The descender and rescue lifting device should be used only by qualified and/or competent persons who have the required knowledge of what is to be done in case of emergencies.

The area of application of the descender and rescue lifting device is between ambient temperatures of -30°C and $+60^{\circ}\text{C}$. In case of temperatures below freezing point, it must be noted that the brake of the descender and rescue lifting device can freeze as a result of the moisture.

2. Technical description

2.1. Technical data

Manufacturer:	Sperian Fall Protection Deutschland GmbH & Co. KG
Type:	SafEscape
Device class:	EN341 Class A, EN1496 Class B
Serial number:
Year of manufacture:
Length of the rope:
Device weight (without rope):	1.65 kg without handwheel 2.3 kg with handwheel
Rope weight:	6.7 kg / 100 m
Test standards:	prEN 341:2008 type 1 Class A EN1496:2007 Class B
Testing agency:	TÜV SÜD Product Service GmbH Ridlerstrasse 65 80339 Munich Germany

CE 0123

The device has been type examination-tested with the following rated outputs as per EN341 / EN1496:

Descent loads / heights:	100 kg / 16 x 500 m = 8000 m (1 hefty person)
Minimum descent load:	30 kg
Ø Descent velocity:	≈1 m/s
Lifting power:	100 kg
Lift:	3.5 m

Additional functional tests can be used to test the maximum power values of the devices:

The device may be used in these conditions only in case of an emergency! Increased descent velocities and severe wear must also be taken into account if necessary!

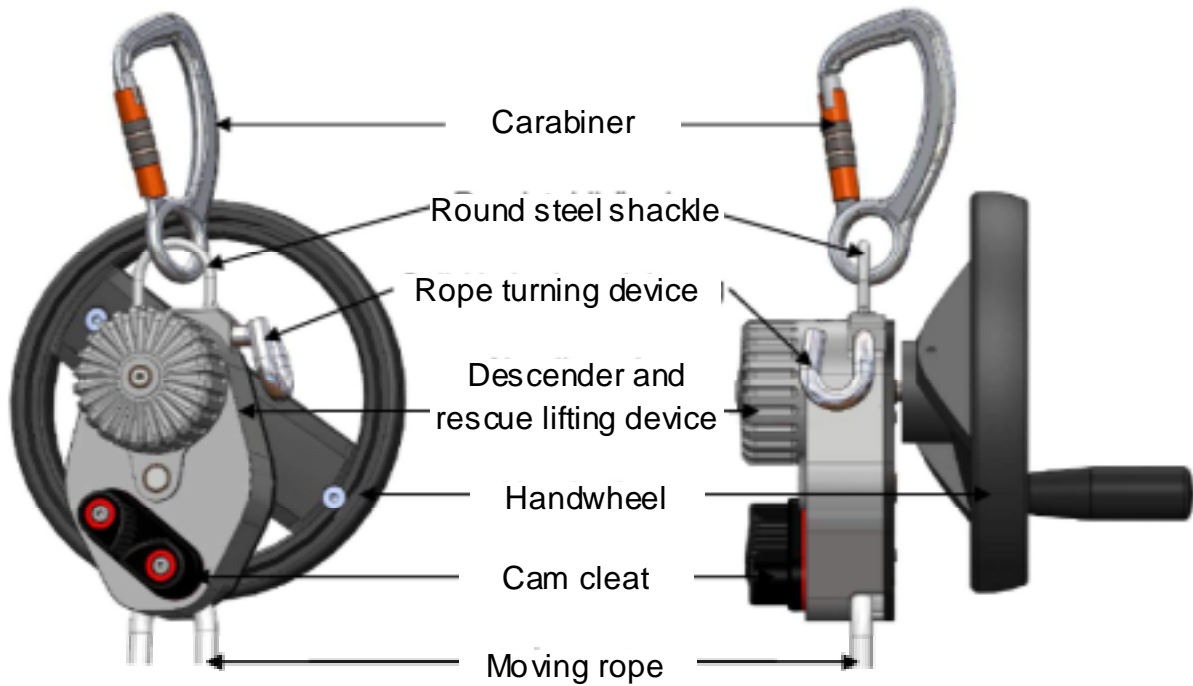
Descent loads / heights:	150 kg / max 2 x 500 m
	250 kg / max 2 x 200 m (2 hefty persons)
max possible lifting power:	280 kg
max possible lift:	10 m and above

Exercises are not termed as emergencies! Certain safety equipment must be kept as reserves. Here, we recommend the following power values:

Descent loads / heights:	75 kg / 20 x 500 m = 10,000 m (1 hefty person)
	100 kg / 15 x 500 m = 7,500 m (1 hefty person)
	150 kg / max 4 x 150 m = 600 m
	250 kg / max 2 x 150m = 300 m (2 hefty persons)
Minimum descent load:	30 kg
Lifting power:	100 kg
Lift:	3.5 m

The rope and the device should be checked for wear after a maximum of 50 descents or 10 liftings.

2.2. Assembly



2.3. Intended use

The descender and rescue lifting device is used to rescue persons who have met with an accident when working at a height or underground.

The descender and rescue lifting device is not a fall arrester!

The descender and rescue lifting device has not been designed for lifting and lowering loads.

3. Preparation

The user must conduct a visual inspection of the descender and rescue lifting device each time before using it to ensure that all its equipment is operational. The rope, the device housing, the safety karabiner, the rope turning point and the handwheel must be free of damage and smooth run-in and run-out of the rope should be possible at the point where it enters and leaves the descender and rescue lifting device. If any type of damage is detected or if there is a doubt regarding the safety of the system, the use of the device must be stopped immediately and the device should be handed over to the manufacturer or one of the experts specified by the manufacturer for checking.

The anchor point for the descender and rescue lifting device must withstand at least 11 kN. Connection to the anchor point can be established using lanyards as per EN 354, holding ropes as per EN 358, karabiners as per EN 362, guided-type fall arresters on a flexible anchor line as per EN 353-2 or tape slings and anchor slings as per EN 795.

If possible, the anchor point should be at such a point on the structure that allows a free descent without obstacles. Descent over sharp edges and sharp-edged objects must be avoided and sufficient distance (approximately 0.5 m) should be maintained from the stonework in order to facilitate descent. If it is not possible to maintain a sufficient distance, the rope must be protected by underlaying it with a suitable edge protection.

During the entire rescue process, ensure that the persons involved are always secured at the base. This means that if there are no railings, the persons must be secured using a full body harness as per EN 361 or lanyards as per EN 354 or energy absorbers as per EN 355.

The operator at the location must ensure the availability of a rescue measures plan which takes into account all possible accidents that may occur.

4. Use

4.1. Rescuing accident victims

Lifting function

After the accident victim who has been secured using lanyards as per EN 354 has fastened the descender and rescue lifting device to a suitable anchor point, the rope end joint at the rope exit must be attached to the chest or back element on the full body harness of the accident victim using the provided karabiner.

The rope between the descender and rescue lifting device and the person to be descended should not be slack. The free rope at the other side is pulled down or tautened using the handwheel. The free rope is led through the turning device, looped through and fixed into the cam cleat.

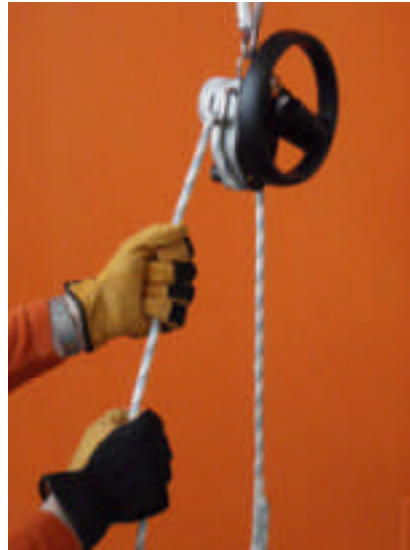


The handwheel can be rotated to elevate the accident victim till he/she can either be lifted to a secure base or the securing lanyard of the person to be rescued can be detached. When doing so, the slack rope between the turning device and the cam cleat is pulled downward and tightened over and over again. This helps in minimising the distance over which the person to be rescued may slip in case the handwheel is inadvertently released.



Descent function

Always put the handle back into the handwheel; else, there can be extreme vibrations during automatic descent due to the lack of balance. Pull the rope in the cam cleat out of the cam cleat from behind and lower the accident victim. Here, the rope is also anchored using the turning device. The released rope easily slides into the hand during descent.



The movement velocity is automatically controlled via a centrifugal brake. In addition, the person on the base (the rescuing person) also has the option of holding onto the rope in his/her hands, thus stopping the descent.

Ensure that the rope which goes up during descent does not get caught in or entangled with the structure, thus interrupting the descent. Also ensure that there are no obstacles during descent.

The rope must always be looped around the turning point during the descent in order to minimise the force to be applied when stopping the descent.

Alternating descent of persons

The descender and rescue lifting device allows several people to abseil one after the other.

When the first person who abseils reaches the ground, he/she unhooks the karabiner of the descender and rescue lifting device from his/her full body harness. The next person to abseil hooks himself/herself to the karabiner on the other rope at the top and abseils or is abseiled.

If every person to be rescued does not have a full body harness, the full body harness or the rescue triangle is taken off by the abseiled person on reaching the ground and left on the rope so that the full body harness again reaches the top with the end of the rope that is now free and can thus be used by the next person who abseils.

4.2. Options for moving the rescuing person

Moving the rescuing person and person to be rescued simultaneously

The process of simultaneously moving two people is permissible only up to a maximum descent height of 200 m.

Both the persons must put on or wear a full body harness as per EN 361 or a rescue harness as per EN 1497 (follow the relevant operating manual).

After the accident victim has been lifted to a secure base, the rescuing person can hook the karabiner at the end of the rope which is already in the chest or back element of the accident victim to the chest element of his own full body or rescue harness.

The rope between the descender and rescue lifting device and the person to be abseiled should not be slack. The free rope at the other side must be pulled downward and fastened in order to tauten the rope. It is also anchored using the turning device.

The persons can now abseil from the base by letting go the fastened rope.

The movement velocity is automatically controlled via a centrifugal brake. In addition, the person who remains on the base can interrupt the movement of the rope moving upwards by braking manually (holding on to the rope).

If there is nobody on the base anymore, the option of stopping the movement manually is no longer available for the entire stretch depending on the rope length (rope supplies), because after half the stretch, the rope coming up is above the abseiling person.

Simultaneous abseiling of two persons provides the option of abseiling a person needing medical aid under supervision.

When moving two persons (max 250 kg) simultaneously, it must be taken into account that the descent velocities will be more as compared to a one-person operation.

Moving the rescuing person after the rescue process

After the rescue process is complete, the descender and rescue lifting device is unhooked from the anchor point by the rescuer and the karabiner on the rope end joint of the free rope is hooked at the anchor point.

The karabiner on the descender and rescue lifting device is hooked at the chest element of the full body harness such that the person with the descender and rescue lifting device can move away.

Tighten and hold the rope below the descender and rescue lifting device (starting point of the rope) if necessary; the rope should not be slack. Here, the rope is also anchored using the turning device.

The person can now abseil from the base by letting go of the rope. The movement velocity is automatically controlled via a centrifugal brake. The movement can also be interrupted by means of manual braking. For that, the rope below the descender and rescue lifting device must be held such that further downward gliding of the device on the rope is not possible.

Note:

Additional safety is always necessary during exercises!

5. Safety instructions

5.1. Storage and transport

The rescue equipment should be stored in dry and cool rooms and protected against UV irradiation. Avoid contact with acids, corrosive liquids and oils. In case the unavoidable moisture penetration of the rope, these should be dried naturally and not using heat sources.

A stable device bag or device case should always be used to transport the rescue equipment in order to avoid damage due to external effects.

5.2. Servicing and cleaning

A visual inspection of the rescue equipment must be conducted before every use in order to ensure that the device is operational.

If damage to the rope, karabiner or descender device is detected, the use of the rescue equipment must be stopped and the device must be checked by the manufacturer or a body authorised by him/her.

Note: No changes or additions must be made to the descender and rescue lifting device; else, the type examination is no longer valid.

Use a dry cloth or brush to clean the housing. The rope can be cleaned with lukewarm water and mild soap followed by rinsing with plain water. Ensure that it is completely dry before packaging. Do not use heat sources!

5.3. Period of wear

The period of wear depends on the relevant operating conditions. Based on the present experiences, a period of wear for textile ropes could be 4 to 7 years under normal operating conditions. The device can be used for many more years depending on the storage and operating conditions.

5.4. Regular inspections

The rescue equipment must be tested at least once a year by the manufacturer or an expert, even if it is not in use. If damage is detected during this inspection or there are doubts regarding the usability of the equipment, the device must be sent to the manufacturer or a service centre authorised by him.

This expert testing must be conducted at least every 2 years either by the manufacturer himself/herself or by an expert authorised by him/her.

Normal use

In case of stronger loads (e.g. ambient or industrial factors having an effect on the material), the complete rescue equipment should be tested more often if required.

After a 3000 m descent with a maximum of 100 kg descent load, the descender and rescue lifting device must be inspected by the manufacturer or an expert authorised by the manufacturer and the rope must also be tested.

This inspection must be conducted well in advance in case of higher descent loads.

Inspections in case of use in training operations / exercises

A visual inspection must be conducted on the descender and rescue lifting device by an expert before every training session since the device is often used in training operation or exercises. The information sheet of the manufacturer must be adhered to when conducting the visual inspection for descender and rescue lifting devices.

In addition, an expert (e.g. skilled trainer) must conduct a revision inspection after the intervals specified below in case of training devices or devices which are often used in exercises.

Test intervals specified by the manufacturer for a revision inspection:

Movement / descent

Device usage	Test interval Revision inspection	Test interval Rope
Movement only with individual persons, Maximum descent load 100 kg Maximum descent height 500 m	With 1000 m descent energy	After 1000 m free movement, i.e., the rope does not run over an edge, etc.
Constant movement with 2 persons Maximum descent load 250 kg Maximum descent height 200 m	After every 2 nd movement	After every 2 nd movement

Lifting

Device usage	Test interval Revision inspection	Test interval Rope
Maximum lifting power 280 kg Maximum lift 3.5 m	10 m	10 m

All the limit values specified for test cycles are applicable only for devices and ropes which do not have any signs of wear. If there are visible / noticeable signs of wear on the rope or the device which do not necessarily lead to absolute retraction of the device, the test intervals must be shortened or the device must be inspected immediately and repaired or scrapped if necessary.

The device must be tested after every training session and one day before the next usage, irrespective of whether or not the above-mentioned limit values for the test cycle have been reached during the previous training session.

The test lists of the manufacturer for conducting the inspection as well as the corresponding operating manuals must be adhered to.

The instructions and the test instructions of the manufacturer must be adhered to.

The available descent energy and the conducted revision inspections must be entered in the attached list for documentation. Descent and lift should be differentiated between in this case.

Authorisation for conducting trainings and exercises.

Application trainings must be conducted only by persons who have been trained (having a certificate / training certificate) by the manufacturer or a direct representative to become a trainer.

Exercises must be conducted only under the supervision of competent persons who have participated (having a certificate / training certificate) in at least one training application by the manufacturer or an authorised person.

The manufacturer or a direct representative of the manufacturer trains the trainers. The training to become a trainer also includes the training to become an expert. The trained trainer is authorised to conduct application trainings as well as expert trainings. Only the trainers authorised by the manufacturer may conduct trainings for trainers.

6. Instructions for the visual inspection of the descender and rescue lifting devices

During the visual inspection of the descender device, ensure that the housings and housing covers have a quality seal which is intact. If it is not, it might mean that the device has been opened by unauthorised persons.

If the seal is missing or damaged, the use of the device must be stopped immediately and the device must be handed over to the manufacturer or one of the experts specified by the manufacturer

6.1. Testing the device housing

Checking the starting point / end point of the rope:

The wear / abrasion of the starting and end point of the rope must be checked. The abrasion at the start and end point of the rope should not be more than 2 mm; if it is, the use of the device must be stopped.

The material in the wear area has a polished scrubbed, smooth and shining surface. The abrasion / wear creates a strong valley in the material.

Checking the device housing:

The housing must be tested for corrosion, mechanical damage, deformation and crack formation.

A visual inspection must be conducted. If there are cracks, deformations, corrosions or mechanical damage, the use of the device must be stopped and it must be sent to the manufacturer for testing.

The bolts must be checked for completeness and fixed seat.

The availability of all bolts must be visually checked. Unfastened bolts must be tightened using an appropriate spanner. If the bolts are no longer completely present, the use of the device must be stopped.

6.2. Checking the cam cleat

The cam cleat must be checked for crack formation, fixed seat and operability.

6.3. Checking the karabiner and the round steel shackle

The karabiners and the round steel shackles must be visually checked for corrosion, mechanical damage, deformation and crack formation. The use of the equipment must be stopped in case of damage.

Independent locking of the karabiner must also be checked.

6.4. Checking the kernmantel rope

The entire length of the rope must be checked visually and manually for cuts, fibre fractures, thickening, kinks, knots, fire areas, strong wear, abrasion, open, released terminations (saturations) and case displacement.

Tear in the saturation and heat shrink tube



Torn open saturation



Strong rope abrasion



Attention must be paid to the properties of the rope (above-mentioned points) during the manual sliding of the rope.

If the rope has one of the above-mentioned properties, the use of the device must be stopped. The rope must be replaced by the manufacturer or a person authorised by the manufacturer.

The material abrasion and brake dust resulting from the use of the device gets partially transferred from the device on to the rope. This results in discolouration of the rope (grey-black), but it does not have an adverse effect on the properties of the rope.

6.5. Checking the handwheel

The handwheel should be checked for fixed sit and operability.

If the handwheel cannot be rotated anymore or if it shakes or rotates without resistance, the use of the device must be stopped.

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