

**PROFESSIONAL ENVIRONMENTAL  
PROTECTION PRODUCTS**



**INSTRUCTIONS FOR USE**

**HIGH-PRESSURE  
LIFTING BAGS**



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# 1. IDENTIFICATION

## 1.1. TYPE OF PRODUCT

- Conventional lifting bags: SLK, SLK-H and SLK-L,
- Flat lifting bags: SFB-K.

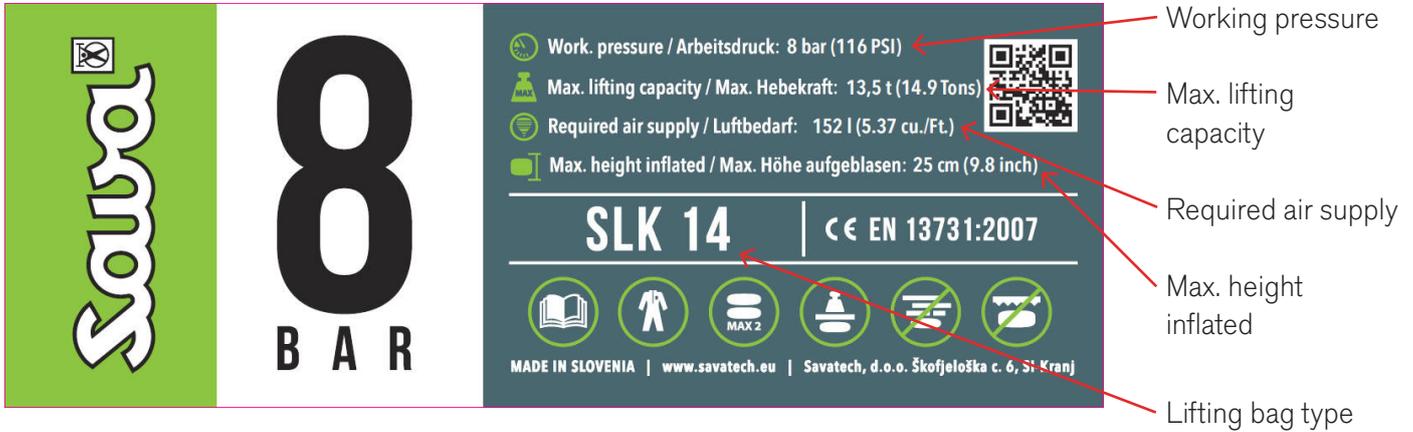


Fig. 1.1: Label on the lifting bag

## 1.2. MANUFACTURER



### Savatech, d.o.o.

Savatech d.o.o.  
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## 2. PRODUCT DESCRIPTION

### 2.1. BASIC FUNCTIONS AND APPLICATION AREAS

Conventional and flat lifting bags are intended for lifting, lowering, positioning, separating and moving of loads weighing up to 88,000 kg. They are mainly used in rescue operations but are suitable for industrial purposes, too.

### 2.2. BASIC DATA

Table 1: Conventional lifting bags (the SLK family)

#### 8 bar- SLK

Type	EU/USA	SLK 1	SLK 3	SLK 6	SLK 10	SLK 14	SLK 21	SLK 25	SLK 33	SLK 45	SLK 55	SLK 70
Product number		<b>77973</b>	<b>77974</b>	<b>77975</b>	<b>76734</b>	<b>76735</b>	<b>76736</b>	<b>76737</b>	<b>76738</b>	<b>76739</b>	<b>76794</b>	<b>573241</b>
Size	cm	15 x 15	22.5 x 22.5	30 x 30	38 x 38	45 x 45	55 x 55	61 x 61	69 x 69	78 x 78	87 x 87	94.5 x 94.5
Thickness	mm	25	25	25	25	25	25	25	25	25	25	26
Weight	kg	0.55	1.25	2	3.5	5	7	9	11	14	18	22.5
Max. Lifting capacity	t	0.8	2.7	5.5	10.1	13.5	21.1	25.2	33	44.6	55	70.4
	Tons	0.9	3.0	6.1	11.1	14.9	23.2	27.7	36.3	49.1	60.5	77.4
Working pressure	bar	8	8	8	8	8	8	8	8	8	8	8
	psi	116	116	116	116	116	116	116	116	116	116	116
Required Air Supply.	L	5	15	42	86	152	296	508	621	921	1305	1505
	cu./Ft.	0.18	0.53	1.48	3.04	5.37	10.45	17.94	21.93	32.53	46.09	53.15
Max. Height inflated	cm	8	13	16	21	25	30	34	38	42	47	52
	inch	3.1	5.1	6.3	8.3	9.8	11.8	13.4	15.0	16.5	18.5	20.5

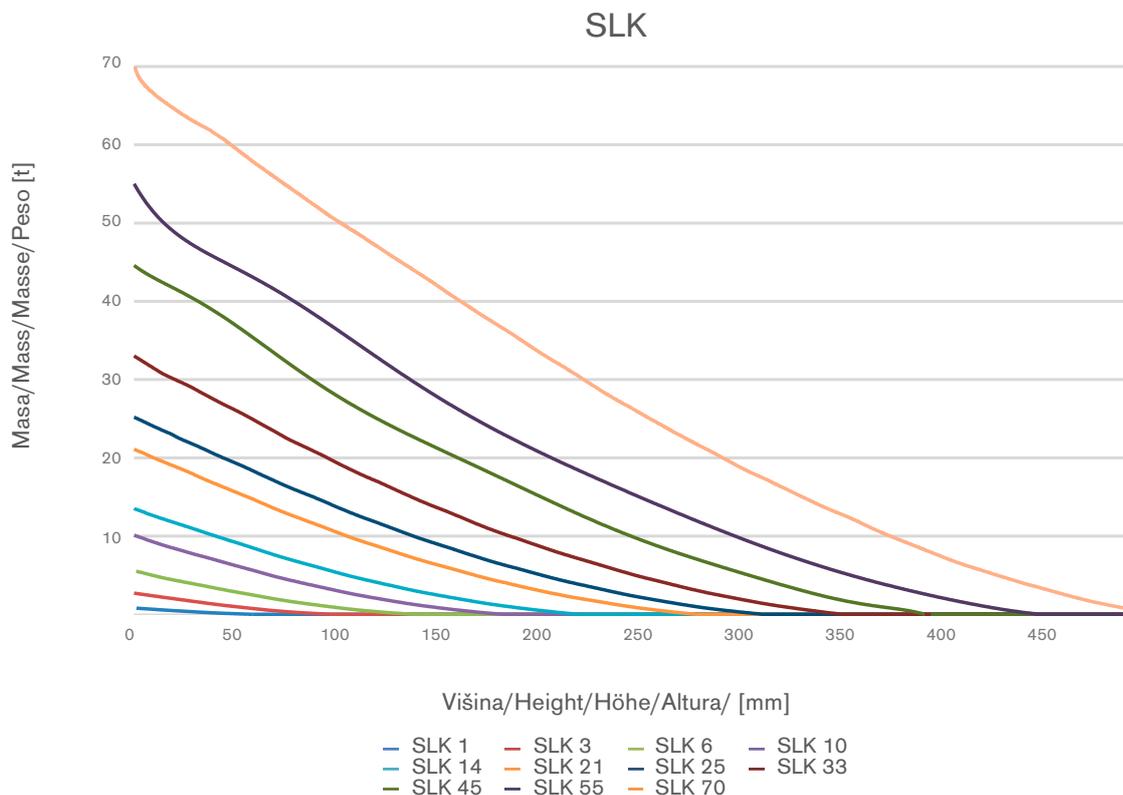


Fig. 2.1: Maximum lifting force depending on the lifting height, the SLK conventional lifting bags

Table 2: Conventional lifting bags (the SLK-H family)

## 10 bar - SLK - H

Type	EU/USA	SLK-H 1	SLK-H 4	SLK-H 7	SLK-H 12	SLK-H 17	SLK-H 26	SLK-H 32	SLK-H 41	SLK-H 56	SLK-H 69	SLK-H 88
Product number		291240	291241	291242	291243	291244	291245	291246	291247	291248	291249	291250
Size	cm	15 x 15	22.5 x 22.5	30 x 30	38 x 38	45 x 45	55 x 55	61 x 61	69 x 69	78 x 78	87 x 87	94.5 x 94.5
Thickness	mm	25	25	25	25	25	25	25	25	25	25	26
Weight	kg	0.55	1.25	2	3.5	5	7	9	11	14.1	18.2	22.7
Max. Lifting capacity	t	1	3.3	6.8	12.1	16.6	26.3	31.8	41.3	55.8	68.7	88
	Tons	1.1	3.6	7.5	13.3	18.3	28.9	35.0	45.4	61.4	75.6	96.8
Working pressure	bar	10	10	10	10	10	10	10	10	10	10	10
	psi	145	145	145	145	145	145	145	145	145	145	145
Required Air Supply.	L	7	19	52	106	186	362	508	759	1122	1595	1650
	cu./Ft.	0.25	0.67	1.84	3.74	6.57	12.78	17.94	26.80	39.62	56.33	58.27
Max. Height inflated	cm	8	13	16	21	25	30	34	38	42	47	52
	inch	3.1	5.1	6.3	8.3	9.8	11.8	13.4	15.0	16.5	18.5	20.5

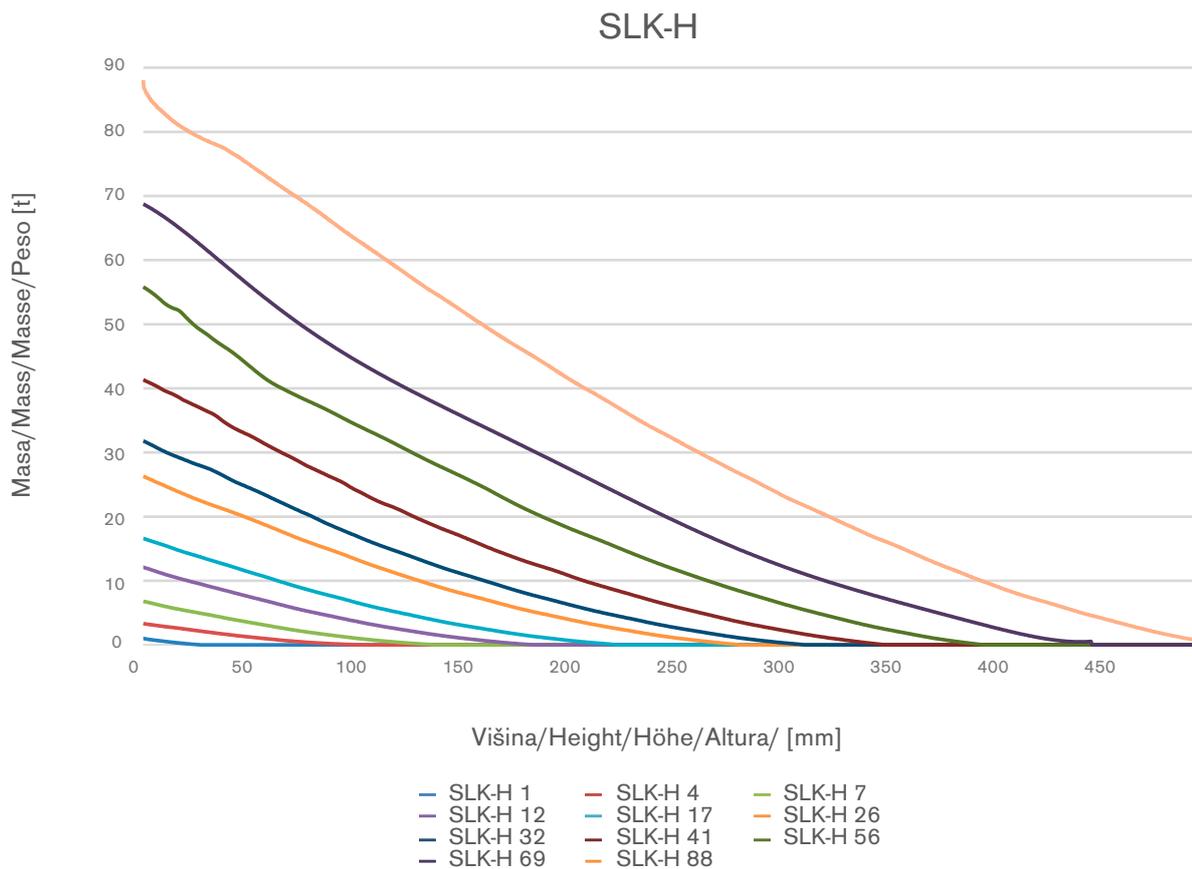


Fig. 2.2: Maximum lifting force depending on the lifting height, the SLK-H conventional lifting bags

Table 3: Conventional lifting bags (the SLK-L family).

## 8 bar - SLK - L

Type	EU/USA	SLK-L 9	SLK-L 13	SLK-L 20	SLK-L 24
Product number		<b>519833</b>	<b>519834</b>	<b>519837</b>	<b>77983</b>
Size	cm	30 x 45	37.5 x 50	37.5 x 75	32 x 102
Thickness	mm	25	25	25	25
Weight	kg	3.3	4.5	6.5	7.8
Max. Lifting capacity	t	8.9	13.2	20.2	24
	Tons	9.8	14.5	22.2	26.4
Working pressure	bar	8	8	8	8
	psi	116	116	116	116
Required Air Supply.	L	95	170	270	220
	cu./Ft.	3.35	6.00	9.54	7.77
Max. Height inflated	cm	19	23	23	20
	inch	7.5	9.1	9.1	7.9

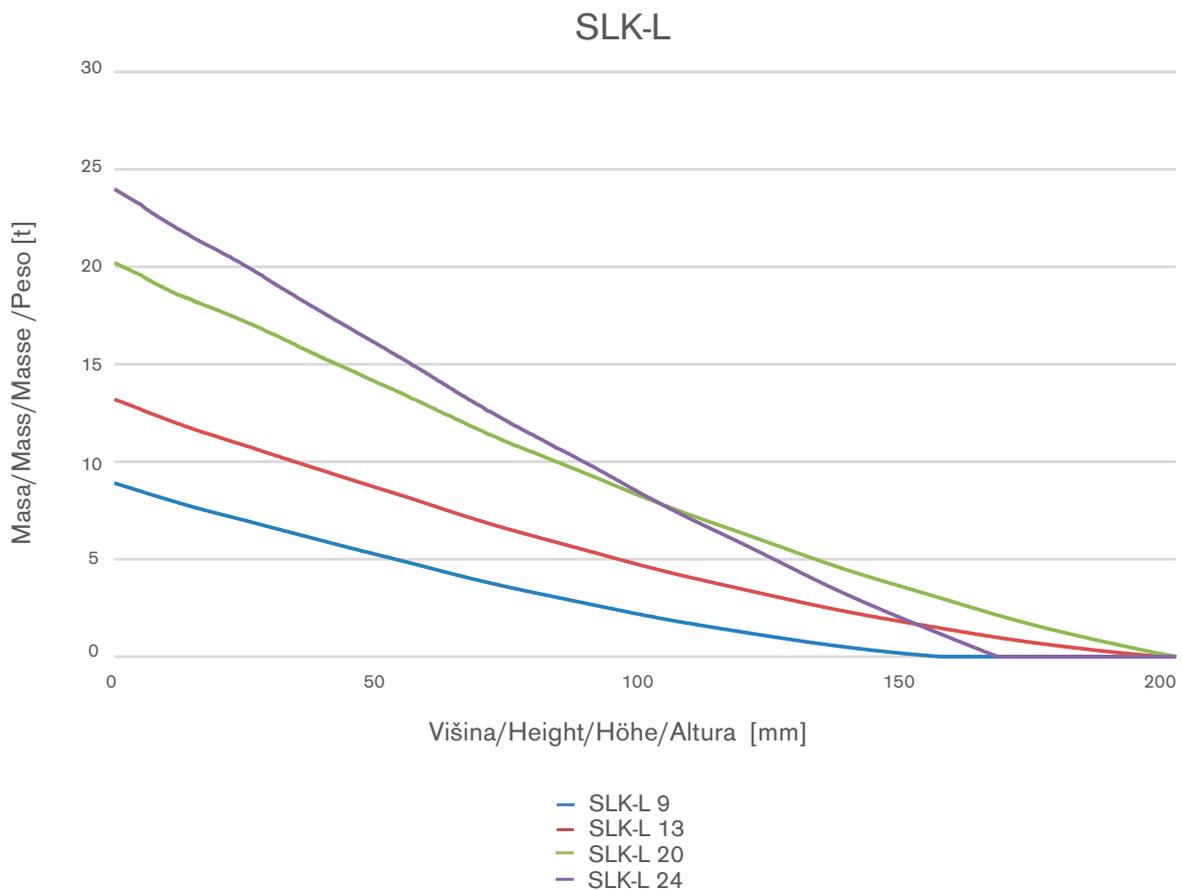


Fig. 2.3: Maximum lifting force depending on the lifting height, the SLK-L conventional lifting bags

Table 4: Flat lifting bags (the SFB-K family).

## 8 bar - SFB - K

Type	EU/USA	SFB-K 7/17	SFB-K 10/17	SFB-K 20/17	SFB-K 33/17
Product number		<b>519883</b>	<b>519884</b>	<b>519885</b>	<b>519886</b>
Size	cm	55 x 55	61 x 61	78 x 78	91,5 x 91,5
Thickness	mm	25	25	25	25
Weight	kg	7	9	14	20
Max. Lifting capacity	t	21.1	25.2	44.6	64
	Tons	23.2	27.7	49.1	70.4
Working pressure	bar	8	8	8	8
	psi	116	116	116	116
Required Air Supply.	L	224	350	520	810
	cu./Ft.	7.91	12.36	18.36	28.61
Max. Height inflated	cm	17	17	17	17
	inch	6.7	6.7	6.7	6.7
Max. Lifting capacity at max. lifting height	t	6.7	9.5	20.2	33.3
	Tons	7.4	10.5	22.2	36.6

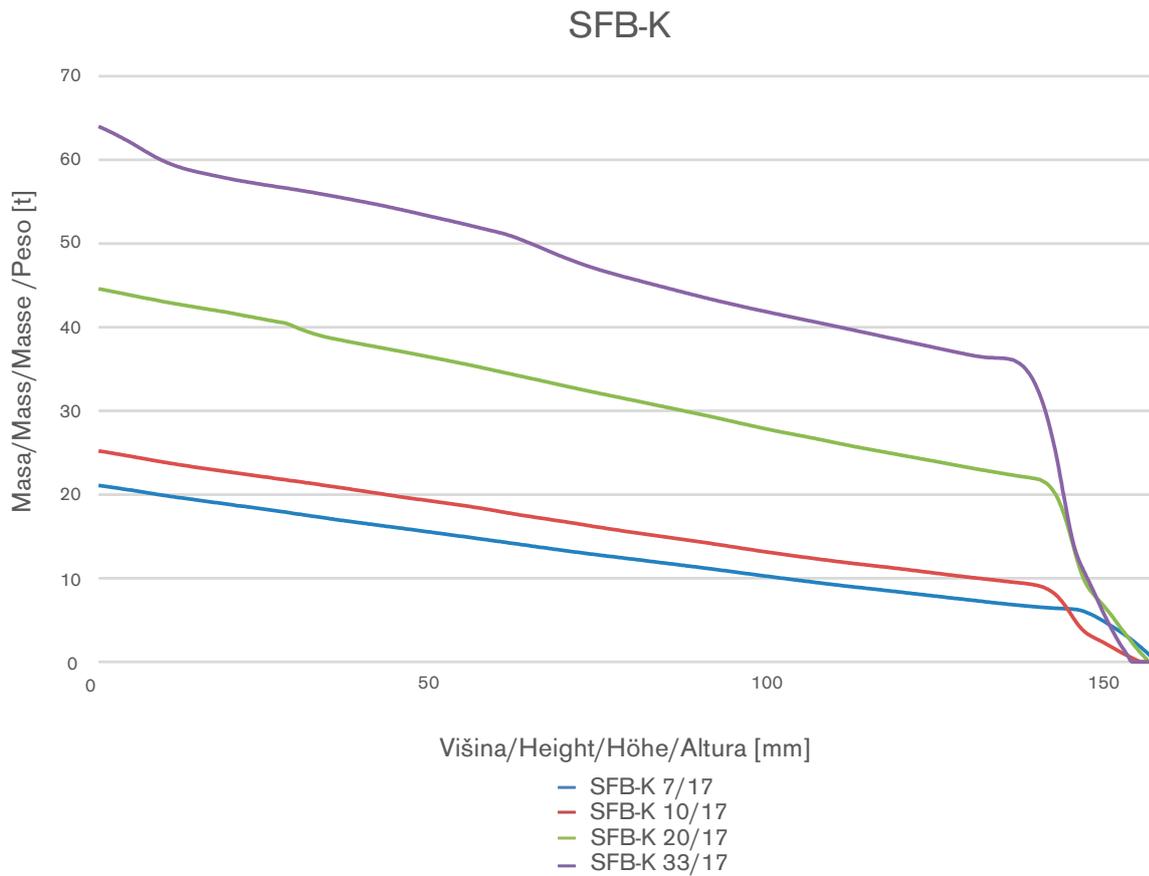


Fig. 2.4: Maximum lifting force depending on the lifting height, the SFB-K flat lifting bags

## 2.3. ENVIRONMENTAL CONDITIONS AND RESTRICTIONS OF USE



Lifting bags are suitable for use in the temperature range from -20 to +80 °C. In the temperature range from -20 °C to -40 °C, their use is limited to 1 hour, whereas in the temperature range from +80 °C to +100 °C, their use is limited to 30 minutes.



The standard version of lifting bags is NOT intended for use in potentially explosive atmospheres; such atmospheres require special types of lifting bags. Further information on special types of lifting bags is available from the manufacturer.

## 2.4. SAFETY AND PERSONAL PROTECTIVE EQUIPMENT

Always wear personal protective equipment when working with lifting bags. Fire fighters and rescue team members shall wear a complete protective gear specified for their work. Other users shall wear protective helmet, goggles and gloves, as well as protective footwear.



## 3. DEFINITIONS

**Conventional lifting bag** changes the shape and size of bearing surface when inflated with air or other media.

**Flat lifting bag lifts** evenly almost over the entire surface during inflation and thanks to its construction, it also keeps the shape and size of bearing surface.

**Bearing surface** is the bag's surface in contact with the load or the object to be lifted.

**Controller** is a device that supplies, empties and supervises the filling procedure with the media.

**Working pressure** is the pressure in the bag during operation.

**Permissible pressure** is the maximum inflation pressure in the bag during operation, specified by the manufacturer.

**Inflation connector** is a connector on the bag where supply hoses are connected.

**Pressure reducer** or pressure reducing valve reduces the pressure of media to the specified pressure value.

**Safety valve** protects the entire system and releases the excessive pressure to unload the system.

**Lifting capacity** is the maximum weight that can be lifted with the bag at a specified pressure.

**Connection hoses** connect the controller and lifting bags.

**Supply hose** is a hose between the air source and controller.

**Contact surface** is the surface of the lifting bag that contacts the load at a definite point of time during the inflation procedure.

## 4. PREPARATION OF PRODUCT FOR USE

### 4.1. TRANSPORT AND STORING

Lifting bags are packed in cardboard boxes. The sensitive parts of the bag are additionally protected. During transport, lifting bags should be placed horizontally or vertically. Bending or breaking of the bag is not allowed. Store lifting bags in a dark and dry place. Make sure they are not exposed to extreme temperatures (see Chapter 4.5)

### 4.2. SAFETY PRECAUTIONS BEFORE USE



**Carefully read the instructions before use!**



Rescue teams should participate in a training course held in conformity with internal training rules. Other users should attend a training course organised by the manufacturer or its authorised training service provider.

### 4.3. REMOVAL OF PACKAGING

Do not use sharp objects such as knives, screwdrivers and similar, for removal of the packaging, as the bag could get damaged.

### 4.4. DISPOSAL OF PACKAGING



Packaging is made of recyclable cardboard; it should be deposited in waste bins for recycled paper or cardboard packaging.

### 4.5. STORAGE AND PROTECTION OF PRODUCT NOT IN USE

Lifting bags should be stored in a dry and dark space.



Lifting bags should be stored in the temperature range from +5 °C to +25 °C.

We recommend storing lifting bags horizontally. When the bag is stored horizontally, the inflation connector should face forward to be easily noticed when moving the bag and thus be able to prevent damaging it.

If the bag is stored upright, we recommend fixing it on the surface (a wall) to protect it from bending. The inflation connector should face upwards.

We recommend storing lifting bags in PVC pouches to minimise various environmental influences on the product during storage.

## 4.6. INSTRUCTIONS AND PERIODIC TESTS REPORTS

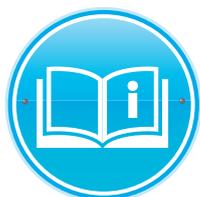
The instructions and periodic tests reports are enclosed to every lifting bag.



**Keep the instructions and periodic test reports throughout the service life of the bag!**

## 5. INSTRUCTIONS FOR OPERATIONS

### 5.1. RECOMMENDATIONS FOR SAFE AND EFFICIENT WORK



**Non-compliance with the instructions can put safety of users and third persons at risk and result in various injuries. Carefully read the instructions for operation before using the bag!**



**WARNING! NEVER REACH UNDER THE LOAD, WHICH IS NOT PROTECTED WITH MECHANICAL SAFETY SUPPORTS!**

- Never exceed the maximum inflation pressure.
- Never place more than two conventional bags on top of each other.
- Never place more than three flat bags on top of each other.
- Never exceed the pressure of 1 bar if no load is placed on the bag.
- Inflate the bag until a required or maximum height, or maximum working pressure is reached.
- Improper use of lifting bags is not allowed. The manufacturer assumes no responsibility for damages resulting from improper use of the product.
- Always use the specified personal protective equipment when working with the lifting bag.

#### 5.1.1. CARRYING THE LIFTING BAG

Carry the bag in upright position and make sure the inflation connector always faces upwards to prevent damage in the case of a fall.

Larger and heavier lifting bags:

- SLK 25, SLK 33, SLK 45, SLK 55, SLK 70
- SLK-H 32, SLK-H 41, SLK-H 56, SLK-H 69, SLK-H 88
- SLK-L 20, SLK-L 24
- SFB-K 10/17, SFB-K 20/17, SFB-K 33/17

or several bags together should be placed horizontally and carried by two persons.

## 5.1.2. WORKING ENVIRONMENT



### TEMPERATURE OF THE OBJECT TO BE LIFTED:

If the surface temperature of the object to be lifted exceeds 55 °C, protect the bag's surface in contact with the object by means of a fibreboard or rubber-coated steel board. The heat and temperatures exceeding the permissible values can damage the lifting bag. Bags preserve their lifting capacity and material properties up to the lowest temperature permitted which is -20 °C.



### LIGHTING OF THE WORKING PLACE:

It is dangerous to work in the dark, even though the positioning and inflating a bag is a simple procedure. Make sure that working place is not in the dark or in the shadow. We recommend using additional lighting also during the day when visibility is poor due to shading. Never use open fire for lighting in the dark.



### PRESENCE OF AUTHORISED PERSONNEL:

Only qualified persons are allowed to prepare and lift/lower the load. Other persons should keep away from the area where lifting bags are prepared, lifted or lowered. In the event of hazards that could put safety of people and the environment at risk, such as outbreak of fire due to fuel leakage, the professional personnel should previously introduce the measures required for minimising such risks.



### FIRE AREAS:

Lifting bags may be used in a fire area only after the contact temperature between the load and the ground drops under 55 °C.

## 5.2. CHOOSING A LIFTING BAG

The following data is required to be able to choose a suitable lifting bag:

- Shape of the load
- Weight of the load to be lifted
- Required lifting height

Consider the data about the load weight and required lifting height as well as the diagrams, see Fig. 2.1, 2.2, 2.3 and 2.4, in choosing a suitable lifting bag.

*An example of choosing:*

*A load of 10 t is to be lifted to the height of 150 mm using one lifting bag.*

*Considering Fig. 2.1., the lifting capacity of conventional lifting bags SLK 33, SLK 45, SLK 55 or SLK 70 meets the requirements. The lifting capacity of the SLK 25 lifting bag is not sufficient for reaching the height of 150 mm.*

*As clear from Fig. 2.2, the conventional lifting bags SLK-H 32, SLK-H 41, SLK-H 56, SLK-H 69 and SLK-H 88 comply with the requirements for this particular application, too.*

*Looking at Fig.2.3, makes it clear that none of the lifting bags SLK-L is suitable for this application.*

*The SFB-K flat lifting bags (Fig 2.4), whose lifting capacity is practically independent of the lifting height, can be used as well. Since the required lifting height amounts to 150 mm, two lifting bags should be placed on top of each other, see Chapter 5.4.2.2.*

## 5.3. SYSTEM FOR LIFTING BAG INFLATION

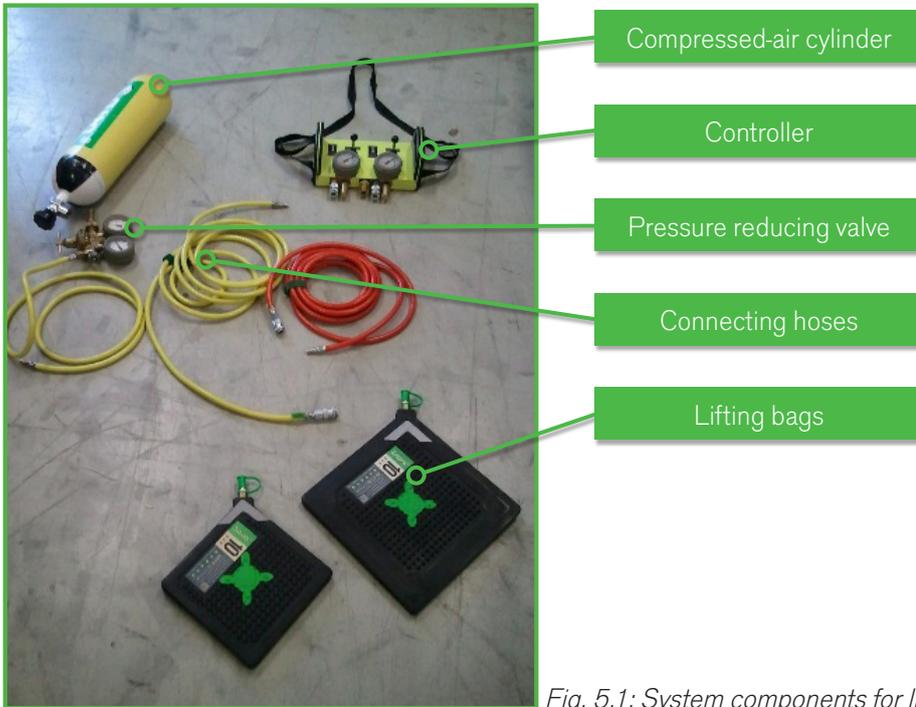


- Lifting bag may be inflated solely with air or water.
- Other gases and liquids are not allowed.
- Controllers with built-in safety valves should be used for inflation of lifting bags.
- Never inflate a lifting bag without a load to more than 1 bar.
- Inflate the lifting bag until the required or maximum lifting height or maximum working pressure is reached.

### 5.3.1. PREPARATION OF LIFTING BAGS FOR LIFTING PROCEDURE

Prepare the following items for lifting loads with lifting bags:

1. Air source
2. Pressure reducing valve (if the pressure of air source exceeds 12 bar)
3. Connecting hoses
4. Controller
5. Lifting bag



*Fig. 5.1: System components for lifting a load with two lifting bags*



**Always use the above-mentioned components when lifting a load with lifting bags.**

**Use only original systems for inflation specified by the manufacturer.**

**If compressed air contains oil, use oil separator.**

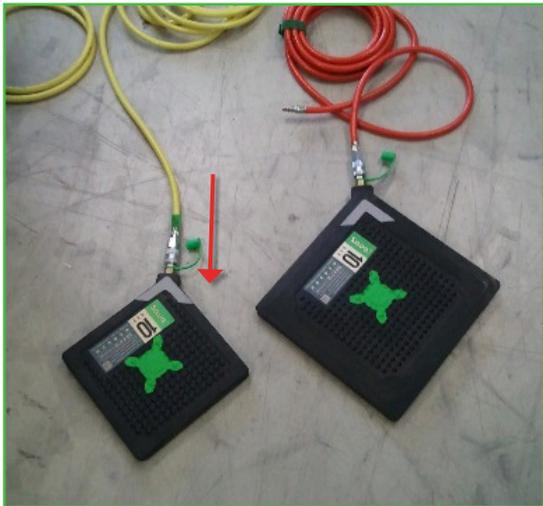
#### Step 1: Place the lifting bags



Place the lifting bag on a defined and previously prepared place. Follow the rules defined in Chapters 5.1 and 5.2. Use mechanical supports for load stabilisation.

*Fig. 5.3: Place the lifting bag where required*

## Step 2: Connect the hoses to the lifting bag



Connecting hoses are of different colours to prevent confusion during use. If several lifting bags are used, connect each bag with the hose of different colour. Hoses are equipped with safety couplings having dual protection.

Connect the hose to the lifting bag. Attach the safety coupling to the hose connector on the lifting bag as shown by the arrow, see Fig. 5.2, and press until it clicks into place.

*Fig. 5.2: Connect the hose to the lifting bag*

## Step 3: Connect connecting hoses to the controller



Connect the hose from the lifting bag to the connection coupling on the controller, see Fig. 5.4. If inserted correctly, the connection coupling clicks into place.

**The connecting hoses should be entirely unrolled. Make sure there are no squeezed or bent spots on the hoses.**

*Fig. 5.4: Connecting the hoses to the controller*

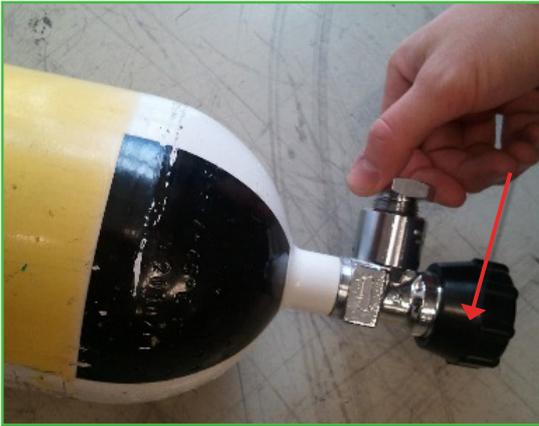
## Step 4: Prepare the air source

A compressed-air cylinder is the most frequently used air source for lifting bags inflation.

If a different air source is used, make sure that:

- Pressure is reduced before entering the controller; the maximum inlet pressure permitted amounts to 12 bar.
- The supply hose connector for connection to the controller should correspond to a coupling of type 26.

#### Step 4.1: Remove the safety plug from the compressed-air cylinder



**Before removing the safety plug, check if the valve on the cylinder is shut-off. It is shut-off when turned clockwise.**

Compressed-air cylinder valve

Unscrew the safety plug and keep it in a safe place.

*Fig. 5.5: Remove the safety plug from the cylinder*

#### Step 4.2: Attach the pressure reducing valve on the cylinder



Shut-off the relief valve on the pressure reducing valve.

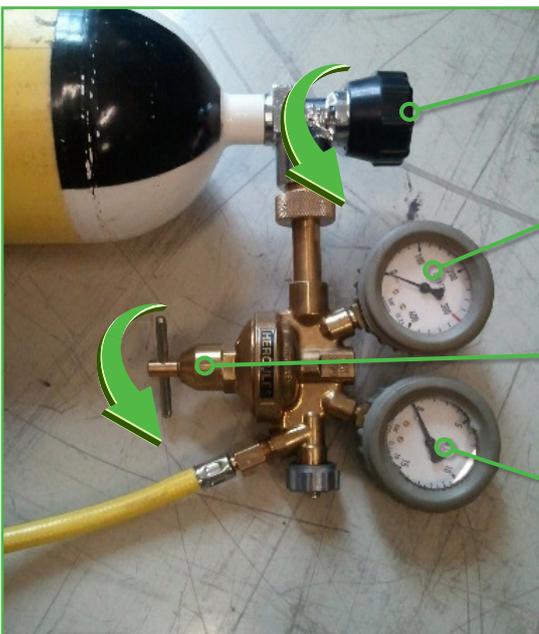
Insert the pressure reducing valve, press it into the connector on the cylinder and screw down the fixing screw tightly, see Fig. 5.6.

When the cylinder lies on the ground, position the valve so that it is protected from any damages.

*Fig. 5.6: Attach the pressure reducing valve*

Relief valve

#### Step 4.3: Set the pressure reducing valve to the required value



Open the valve on the cylinder.  
Unscrew it completely then turn it by a half turn backwards.

The pressure gauge should show a value of 200 or 300 bar,  
depending on the capacity of compressed-air cylinder.

The required working pressure value is set by turning the adjusting valve.

Observe the set value on the outlet pressure gauge (8 or 10 bar)  
during values setting.

*Fig. 5.7: Setting the pressure reducing valve*

### Step 5: Connect the supply hose to the controller



Connect the hose connector to the inlet air supply coupling on the controller, see the arrow in Fig. 5.8. If correctly inserted, the coupling on the controller clicks into place. Move the coupling housing by 180° left or right to lock the coupling.

*Fig. 5.8: Connect the supply hose to the controller*

### Step 6: Relieve the pressure reducing valve



Release the pressure into the controller by turning the relief valve anti-clockwise.

*Fig. 5.9: Relieve the pressure reducing valve.*

## 5.3.2. WORKING WITH THE CONTROLLERS



**Always monitor the pressure on the respective pressure gauge, as well as behaviour of lifting bags and the load during lifting bags inflation.**

If the permissible pressure in the lifting bag is exceeded, the safety valve activates and relieves the pressure from the lifting bag.

### 5.3.2.1. Dual controller and single controller with control levers



Using a dual controller, one, two or three lifting bags can be operated simultaneously. The lifting bags are handled by means of a control lever under the respective pressure gauge. When the control lever is in the upper position, the pressure in the connected lifting bag builds up. When the control lever is in the lower position, the pressure in the lifting bag reduces. When the control lever is released, it automatically returns to its neutral position. The filling and discharge valve is shut-off.

Fig. 5.10: Dual controller

### 5.3.2.2. Controllers with a ball valve or a foot pump

Tighten the protective screw on the safety valve of the controller with a ball valve or a foot pump, before air is supplied and the pressure in the connected lifting bag builds up, see Fig. 5.11.

The pressure in the connected lifting bag builds up if the ball valve of the controller is opened. When using the controller with a foot pump, the pressure in the lifting bag builds up by activating the foot pump.

To release the air or reduce the pressure in the lifting bag, unscrew the protective screw on the safety valve, either in the case of the controller with a ball valve or a foot pump.



Fig. 5.11: Tighten or unscrew the protective screw on the safety valve of foot pump

**WARNING! When using the controller with a ball valve or a foot pump, a quick air release from the lifting bag is not possible, which is why a special caution is required when inflating the bag.**

### 5.3.3. DISCONNECTION OF LIFTING BAGS

Lifting bags and other required components are under high pressure, which is why extreme caution is required when disconnecting them. Disconnect the lifting bags as follows:

#### Step 1: Shut-off the valve of the compressed-air cylinder

Shut-off the valve of the compressed-air cylinder; see Fig. 5.5.

#### Step 2: Shut-off the relief valve on the pressure reducing valve

By turning the relief valve on the pressure reducing valve clockwise, the pressure in the controller is shut-off, see Fig. 5.9.

#### Step 3: Pressure release from the lifting bags

Completely release the pressure from the connected lifting bags by means of the controller, see Fig. 5.10.

#### Step 4: Relieving the supply hose

Completely release the air from the supply hose and valves into the connected lifting bags by means of the controller. Immediately after that, empty the lifting bags again.

### Step 5: Disconnect the supply hose from the controller



Turn the coupling housing until the groove on the housing clicks in, see Fig. 5.12 bottom right. Press the coupling housing toward the controller and pull out the hose connector.

*Fig. 5.12: Disconnect the supply hose from the controller*

### Step 6: Dismount the pressure reducing valve

Unscrew the fastening screw on the pressure reducing valve and separate the pressure reducing valve from the compressed-air cylinder, see Fig. 5.6.

### Step 7: Attach the safety plug on the compressed-air cylinder

Attach the safety plug on the compressed-air cylinder, see Fig. 5.5.

### Step 8: Disconnect the connecting hoses from the controller



Insert the hose connector into the plug towards the controller. Press the coupling housing towards the controller. Release the hose connector to release it automatically from the coupling.

When connecting hoses are disconnected, the pressure automatically releases from the hoses.

*Fig. 5.13: Disconnect the connecting hoses from the controller*

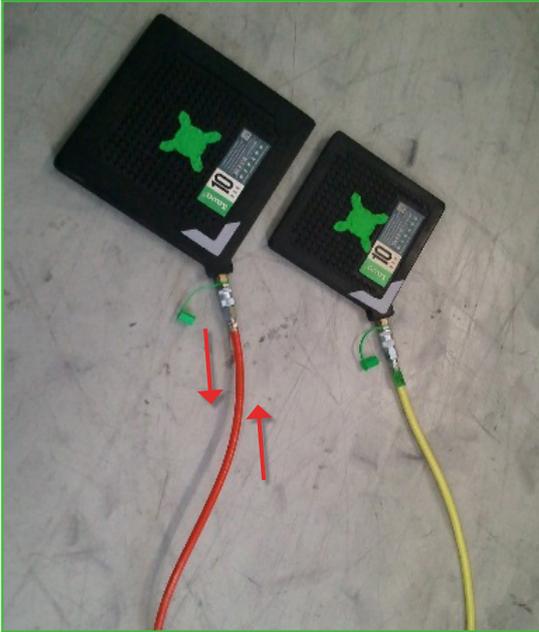
### Step 9: Pull the lifting bags from the place of lifting

Pull the lifting bags from the work area and keep them in an easy accessible place.



**WARNING!** Do not remove the lifting bag by pulling the connecting hoses.

## Step 10: Disconnect connecting hoses from the lifting bag

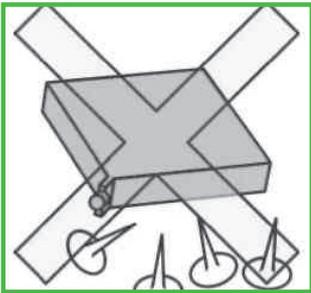


Press the hose coupling towards the lifting bag. Push the coupling housing away from the lifting bag and release the hose, after which the plug of the lifting bag automatically jumps out of the coupling.

*Fig. 5.14: Disconnect the connecting hoses from the lifting bag*

## 5.4. LIFTING PROCEDURE

Before starting the work, check the place where the bag will be put.



Remove any glass fragments, sharp objects and other foreign particles to avoid damages or a breakdown of the bag. Make sure to prevent contact of the lifting bag with any sharp metal edges, tips of brackets, nails, screws and similar.

If a danger of slipping exists due to:

- Oil stains
- Chemicals that could affect the properties of rubber
- Ice or snow

strew some sand or any other granulated material on that place or use a rubber-coated steel plate as a protection.

If the bag is used on a non-consolidated or soft terrain, put a firm support such as a rubber-coated metal plate or fibreboard under the bag to assure stability during lifting and prevent a possible slipping of the load or the bag.

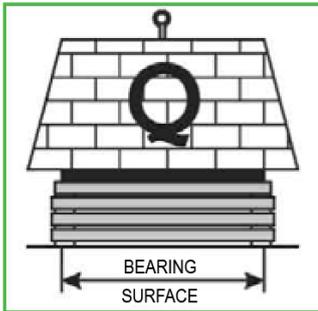


**WARNING! A mechanical safety support MUST be used in all lifting operations. It is not allowed to work under the load that is supported with an inflated bag only.**

Insert the bag on a prepared place or built support, see Fig. 5.15.



**WARNING!** It is possible that certain parts of the load are not fixed onto the load to be lifted. It is **NOT** allowed to support the loosely hanging parts with the inflated bag in order to lift the load.



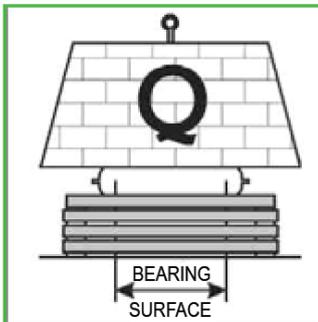
*Fig. 5.15: Mechanical safety support and bearing surface*

A mechanical safety support should be firm enough to withstand the load. It should be placed on a solid surface to minimise possible slipping.



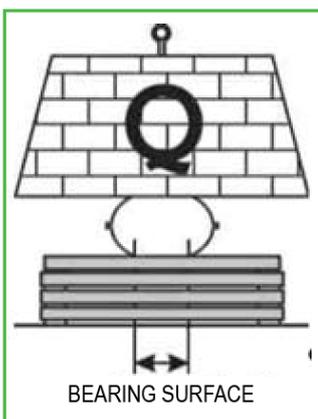
**When conventional lifting bags are inflated, their contact surface decreases with lifting and so does the lifting capacity. For the lifting capacity depending on the lifting height see Fig. 2.1, 2.2, 2.3 and 2.4.**

The lifting capacity is the highest at the beginning of lifting procedure when the lifting height is the lowest (Fig. 5.15). When the lifting bag is inflated, it gradually gets its spherical shape (Fig. 5.16), while the bearing surface and thus the lifting capacity reduce correspondingly.



*Fig. 5.16: Bearing surface reduces while the lifting height increases*

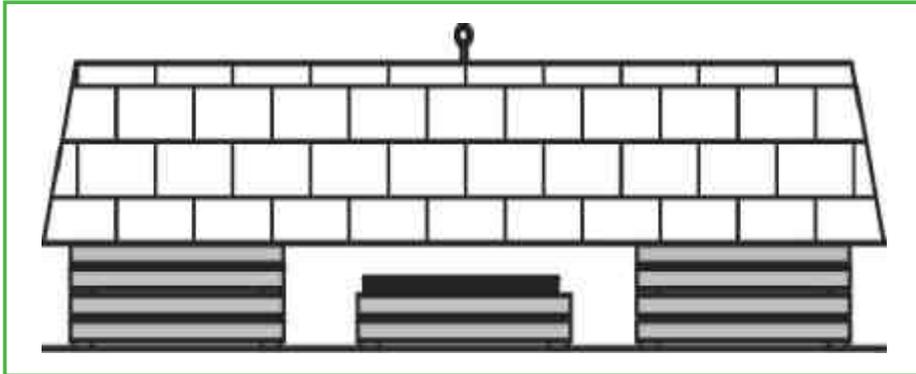
When the lifting height is at its maximum, the contact surface and lifting capacity of the lifting bags are at their minimum (Fig. 5.16).



*Fig. 5.17: Minimum bearing surface at the maximum lifting height*

### 5.4.1. LIFTING WITH A SINGLE LIFTING BAG

When a space between the ground and the object to be lifted exceeds 70 mm and only one lifting bag is available, build a firm and sufficiently high support, leaving just enough space for inserting an uninflated bag. The upper surface of the support should form a gap-free contact surface between the support and the uninflated lifting bag.



*Fig. 5.18: Safety supports – the uninflated lifting bag*

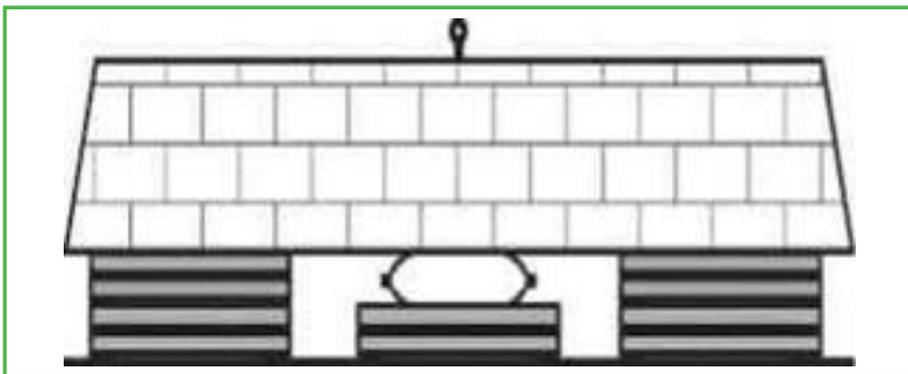
Build a safety support on each side of the load to the point where it is impossible to insert another level (Fig. 5.18). In this way the height, from which the object would fall in case of an abrupt air loss in the bag or its destruction, is reduced.

Insert the bag in the middle of the support so that the inflation connector is on the front side. Make sure that the upper bag surface completely rests on the bottom side of the load. A too small bearing surface can cause the load to slip away during inflation, as well as a sudden and uncontrolled ejection of the lifting bag from under the load.

Slowly inflate the bag to reach the required height and simultaneously add lateral safety supports, see Fig. 5.18.



**Do not inflate the lifting bag during adding lateral safety supports.**



*Fig. 5.19: Safety supports – the inflated lifting bag*

When reaching the final height, carefully deflate the SAVATECH lifting bag allowing the load to sit safely on safety supports. If a working space is required under the point of lifting, remove the bag and the support under the bag.



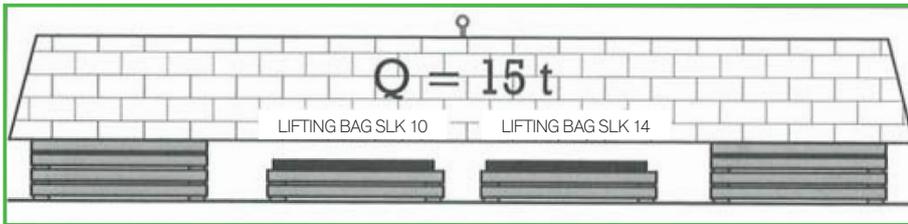
**When working under the load, the load should be stabilised and the SAVATECH lifting bag completely deflated.**

## 5.4.2. LIFTING WITH SEVERAL LIFTING BAGS, INCREASING THE LIFTING CAPACITY AND HEIGHT

Lifting capacity can be increased by combining two lifting bags, which are placed side by side and simultaneously inflated, see Fig. 5.20. The new capacity is double the capacity of the smaller lifting bag.

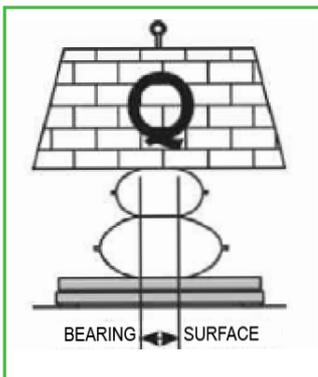
*Example:*

*The capacity of combined lifting bags SLK 10 and SLK 14 side by side and simultaneously inflated amounts to 20 t, which is enough to lift a load of 15 t.*



*Fig. 5.20: Two lifting bags placed side by side to increase the lifting capacity*

The lifting height can be increased by placing one lifting bag on top of the other lifting bag, see Fig. 5.21. and Chapters 5.4.2.1 and 5.4.2.2. The total lifting height of such a combination equals the sum of lifting heights. The load capacity of the combination equals the capacity of the smaller of both lifting bags.



*Fig. 5.21: Combined lifting bags to increase lifting height*

**WARNING:** If the required lifting height cannot be determined, choose the biggest lifting bag available that can be inserted under the load.

*Example:*

*The combination of lifting bags SLK 10 (21 cm) and SLK 14 (25 cm) stacked one upon the other enables a total lift of 46 cm.*

### 5.4.2.1. Conventional lifting bags



**ONLY TWO lifting bags SLK, SLK-H and SLK-L may be combined to increase the lifting height.**

When combining the lifting bags in order to increase the lifting height, put the smaller bag in the middle of the bigger one so that both connectors are turned forward, see Fig. 5.22.

Set up the safety supports and the base for the lifting bag as in the case of lifting with a single bag (Chapter 5.4.1). First, inflate the lower, larger bag until the upper, smaller bag touches the load. Afterwards, completely inflate the upper bag and, if required, also the lower bag until reaching the required lifting height.



*Fig. 5.22: Combining conventional lifting bags to increase the lifting height*

#### 5.4.2.2. Flat lifting bags



**MAXIMUM THREE** lifting bags SFB-K may be combined to increase the lifting height.  
**Combine the lifting bags of the same size only.**

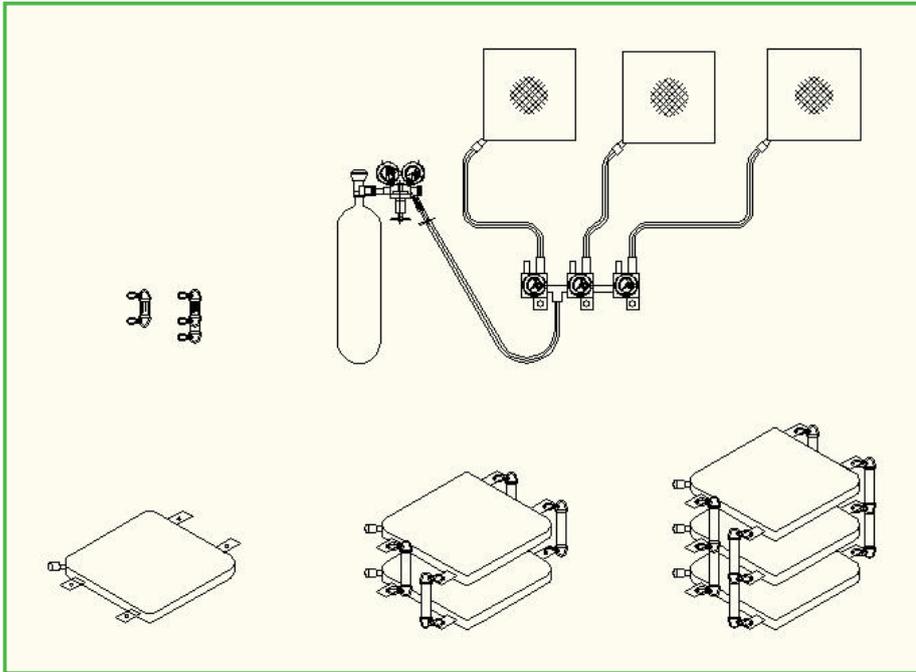
When combining the lifting bags to increase the lifting height, place the bags on top of each other and make sure that all connectors are turned forward, see Fig. 5.23. Insert the enclosed karabiners through the handles and connect the lifting bags, see Fig. 5.24, to prevent lifting bags from slipping.

Set up the safety support and base for the lifting bag, follow the procedure for working with a single lifting bag, see Chapter 5.4.1.



*Fig. 5.23: Combining flat lifting bags to increase lifting height*

When using two or three lifting bags placed on top of each other to lift the load, first inflate the lower bag and then proceed to the top one. Empty the lifting bags in reversed order.



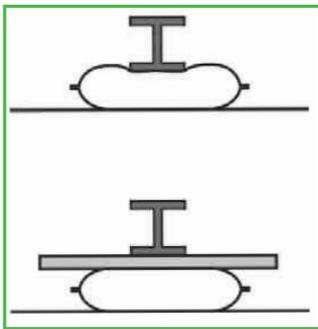
*Fig. 5.24: Combining flat lifting bags to increase lifting height*

### 5.4.3. LIFTING OF LOADS OF UNUSUAL SHAPES

#### 5.4.3.1. Lifting of pipes and profiles

The problem appears when the load does not rest over the entire lifting surface of the lifting bag. Moreover, the lifting bag can get damaged if it bends or is overloaded with pointy or sharp-edged loads.

Insert a rubber-coated metal plate or fibreboard between the lifting bag and the load to allow lifting force to evenly distribute over the entire bag's lifting surface, see Fig. 5.25.



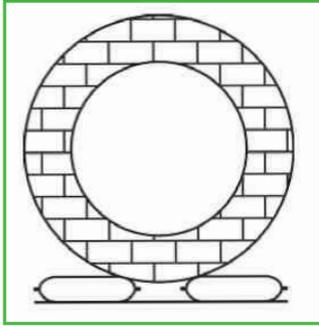
*Fig. 5.25: Supporting the lifting bag with a fibreboard when lifting profiles or pipes*

#### 5.4.3.2. Lifting of cylindrical objects



**Larger cylindrical objects such as tanks cannot be lifted with a single lifting bag. If the load is not firmly fastened, it will roll away as soon as the bag begins to inflate and gets its typical spherical form.**

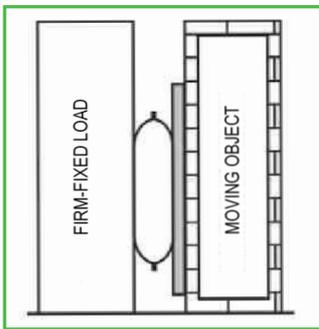
For this reason, two lifting bags are used for lifting of cylindrical objects, placed one at each side of the object, see Fig. 5.26. Make sure that lifting bags are inflated evenly and simultaneously.



*Fig. 5.26: Lifting large cylindrical loads*

#### 5.4.3.3. Separating and pushing with a lifting bag

Lifting bags can further be used for separating and pushing objects; however, a problem can arise with thin-walled objects, as they could bend or tore due to the bag's pressure. For this reason, lean the bag against a bar, a pillar or another firm and rigid element; if this is not possible, insert a rubber-coated plate or thick fibreboard between the bag and the object to allow distribution of the pushing force over a larger surface, see Fig. 5.27.



*Fig. 5.27: Moving or separating objects*

## 5.5. UNEXPECTED SITUATIONS



If the lifting bag, supply hoses and other components of the lifting system are damaged, which could compromise safety at work, immediately interrupt work and replace the damaged component. Working with lifting bags and hoses that exhibit cracks, bulges, unusual deformations and similar is NOT allowed.

If lifting of loads with lifting bags is estimated a hazard to either persons to be rescued or a rescue team, interrupt work. Consult rescue operations professionals on using an alternative lifting procedure (crane, towing, etc.)



A very loud bang is heard if the lifting bag destructs.

Table 5: Unexpected situations

Unexpected situation	Consequence	Procedure
<p>Abrupt pressure drop in the bag.</p> <p>The bag and the load sink in an uncontrolled manner.</p>	<p>The load sinks down to the support.</p> <p>A very loud bang is heard when the bag destructs.</p>	<p>If a failure is identified on one of the components, replace that component; otherwise replace all components.</p>
<p>Even though the pressure gauge shows the working pressure is reached, the bag does not lift.</p>	<p>The load cannot be lifted.</p>	<p>Double-check whether a suitable lifting bag was chosen.</p>
<p>In spite of the activated valve for bag inflation, the working pressure on the pressure gauge is not reached.</p>	<p>The load cannot be lifted.</p>	<p>Check the bag inflation system. Examine individual components and if a failure is identified on one of the components, replace the component; otherwise replace all system components.</p>
<p>Uncontrolled slipping of the load or lifting bag.</p>	<p>The load is unbalanced.</p>	<p>Very carefully lower the load to the basic position or to the support; previously check and, if required, arrange the basic position or support.</p> <p>After lowered to the basic position or the support, double-check whether lifting bags are correctly set-up.</p>
<p>Uncontrolled exceeding of working pressure</p>	<p>Lifting bag destructs which is accompanied by a loud bang.</p>	<p>The lifting bags system is secured by means of safety valves. If working pressure is exceeded, immediately interrupt the lifting procedure and carefully lower the load to the prepared supports.</p> <p>Check the lifting bags inflation system. Examine individual components and if a failure is identified on one of the components, replace the respective component, or replace all system components.</p>

## 5.6. ACCESSORIES

Please see Table 6 for the list of accessories. Further information is available from the seller or on the seller's website.

Table 6: Accessories

Compressed-air cylinder 300 bar, 6l
Pressure reducer 8 bar
Pressure reducer 10 bar
Supply hose, 5 m yellow
Supply hose, 5 m red
Supply hose, 5 m blue
Supply hose, 5 m grey
Supply hose, 10 m yellow
Supply hose, 10 m red
Supply hose, 10 m blue
Supply hose, 10 m grey
Air hose 10 m with a ball valve
Truck tyre compressor adapter
Shut-off valve 0.5 m hose
Single controller 8 bar
Dual controller 8 bar
Hand-held single controller deadman 8 bar
Hand-held dual controller deadman 8 bar
Deadman controller 8 bar
Single controller 10 bar
Dual controller 10 bar
Hand-held single controller deadman 10 bar
Hand-held dual controller deadman 10 bar
Deadman controller 10 bar
Shut-off valve with safety coupling + safety valve
Standard plug - double
Truck tyre inflation connection
Tyre inflation valve
Tyre inflation valve connection
Dual connector 200/300 bar
Triple connector 200/300 bar
Universal connector kit
PVC bag for lifting bag storage
Truck compressed air connector
Truck compressed air connector- blind coupling

The expression "deadman" means that a certain procedure such as inflation or deflation, is carried only out when the user presses the actuator.

## 5.7. DISPOSAL OF WASTE MATERIAL



A damaged or destroyed product or a product whose service life has expired should be withdrawn from the use. Since a lifting bag is not an ordinary waste but a reusable one, waste classification according to the valid local regulations applies.

The product is recyclable.

## 6. MAINTENANCE AND CLEANING

### 6.1. SAFETY PRECAUTIONS



Use protective goggles, gloves and footwear when cleaning the bags.

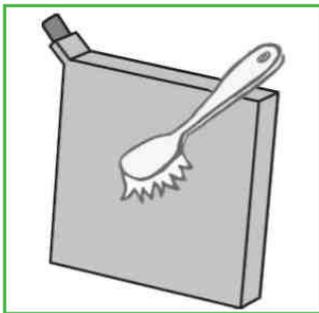
### 6.2. MAINTENANCE AND CLEANING AFTER USE

#### 6.2.1. MAINTENANCE OF LIFTING BAGS AFTER USE

Clean and check the bag after every use. Oily and greasy stains can cause the bag to slide, while dirt in the inflation connector prevents connection with a hose and obstructs air or water flow.

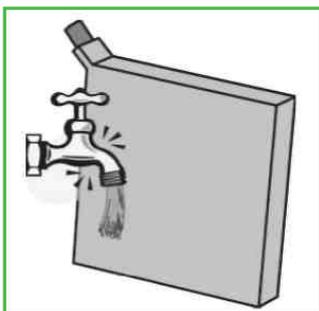
Position the bag with a connector upwards, shake it and beat it against the floor to get the dirt off.

Check the opening in the connector; if it is filled with dirt, remove it using a thin wire. Pull the dirt out of the connector; make sure you do not push it in the bag.



Use a brush with hard bristles to remove the agglutinated dirt from the surface. Move the brush in different directions. It is not allowed to use sharp objects for dirt removal from the bag surface.

When the agglutinated dirt is removed, soak the surface stains with a mild solution of dish washing detergent and warm water, and remove the rest of the dirt from the surface. Never use petrol, thinning agent, alcohol or aggressive cleaning agents.



Rinse the surface with some cold clean water. A strong water jet removes the remains of dirt and detergent from the surface.



**Use of high-pressure cleaner is NOT allowed.**

Place the lifting bag upright, wipe the connector with a clean cloth. Let the lifting bag dry in the air.



**Never dry lifting bags in a drier or by means of heating devices.**

Carefully examine the cleaned and dried lifting bags, as follows:

- Check the bag for air blisters, cuts or worn out sections that might be hidden under the dirt. Mark any damage or defect with a chalk. Consult the manufacturer or an authorised service about the damage and further use of the bag.
- Check the connector for any damage that disables connection. If damages prevent connection of the connection coupling with a supply hose, replace the connector.

#### 6.2.1.1. Replacing the connector on the lifting bag

The following is needed when replacing the connector:

- Spare connector (see the list of accessories)
- Two keys No. 17
- Teflon sealing tape

Remove the plug from the connector. Using the keys as shown in Fig. 6.1, unscrew the plug and remove the throttle (only lifting bags SLK 1, SLK 3, SLK 6, SLK-H 1, SLK-H 4, SLK-H 7 are equipped with a throttle). Clean the throttle (Fig. 6.2) with a dry cloth and the opening in the throttle with compressed air.



*Fig 6.1: Replacing the connector in the lifting bag Fig.6.2: Throttle*

Wrap the thread of the spare connector with a protective cap with some Teflon sealing tape. Insert the throttle in the bag connector and manually tighten it, see Fig. 6.3.



Fig. 6.3: Attaching a new connector

Fix the connector by means of keys. Close the connector with a protective cap.

### 6.2.2. MAINTENANCE OF SUPPLY AND CONNECTING HOSES AFTER USE

Clean supply hoses with a mild solution of dishwashing agent and warm water after every use. Rinse the hoses with some clean cold water.



**Use of high-pressure cleaner is NOT allowed.**

Check the opening in the connector and coupling. If the connector and coupling are filled with dirt, remove it using a thin wire. Always pull the dirt from the connector or coupling, never push it in the hose.

Wipe the supply hoses with a dry cloth.



**Do not dry supply and connecting hoses in a drier or by means of heating devices.**

Carefully examine the cleaned and dried supply hoses, as follows:

- Check for any cuts and worn-out parts. Mark the damage or defect. Consult the manufacturer or an authorised service about the damage and further use of the bag.
- Check the connector. If damage prevents connection of the connecting coupling and supply hose, replace the supply hose.
- Check the coupling. If damage prevents connection to the connector on the lifting bag, replace the supply hose.

### 6.2.3. MAINTENANCE OF THE CONTROLLER AFTER USE

Clean and maintain the controllers in compliance with the instructions about using the controllers.

## 6.3. PREVENTIVE MAINTENANCE

Preventive maintenance includes compulsory inspection of lifting bags and the associated equipment for lifting, performance of tests and replacement of damaged parts.

The enclosed check-up lists can be of assistance when carrying out preventive maintenance.

Always comply with the valid local regulations when carrying out preventive maintenance.

Always use personal protective equipment during check-ups and testing. Firefighters and rescue team members should wear the complete gear as specified for their work. Other users should wear protective helmet, goggles, gloves and footwear.



Observe the instructions for safe work.



If a doubt arises as to the safe performance of a test, immediately interrupt the test and consult the manufacturer or its authorised representative about further steps.



**Function tests or pressure tests** (bold written in the tables) are allowed only after a previous visual check verifies the bag is defect free.



It is **NOT ALLOWED** to use the lifting bag if a visual or function test shows damages or leakages on the lifting bag, damages or irregularities in operation of the equipment.

### 6.3.1. CHECK-UP INTERVAL

Test	Check-up interval	Performed by	Procedure
Visual test	After every use Annually	A person qualified for operating lifting bags	Chapter 6.3.1.1.
Function test	After every use Annually	A person qualified for operating lifting bags	Chapter 6.3.1.2.
Periodic test	5, 7, 9, 11, 12, 13 and 14 years after the manufacture	Manufacturer or a person authorised by the manufacturer	

## Pressure reducing valve

Test	Check-up interval	Performed by	Procedure
Visual test	After every use Annually	A person qualified for operating lifting bags	Chapter 6.3.1.3.
Function test	After every use Annually	A person qualified for operating lifting bags	Chapter 6.3.1.4.
Periodic test	5, 7, 9, 11, 12, 13 and 14 years after the manufacture	Manufacturer or a person authorised by the manufacturer	

## Supply hose

Test	Check-up interval	Performed by	Procedure
Visual test	After every use Annually	A person qualified for operating lifting bags	Chapter 6.3.1.5.
Function test	After every use Annually	A person qualified for operating lifting bags	Chapter 6.3.1.6.
Periodic test	5, 7, 9, 11, 12, 13 and 14 years after the manufacture	Manufacturer or a person authorised by the manufacturer	

## Controller

Test	Check-up interval	Performed by	Procedure
Visual test	After every use Annually	A person qualified for operating lifting bags	Chapter 6.3.1.7.
Function test	After every use Annually	A person qualified for operating lifting bags	Chapter 6.3.1.8.
Function test of pressure gauges	After every use Annually	A person qualified for operating lifting bags	Chapter 6.3.1.9.
Function test of safety valve	After every use Annually	A person qualified for operating lifting bags	Chapter 6.3.1.10.
Periodic test	5, 7, 9, 11, 12, 13 and 14 years after the manufacture	Manufacturer or a person authorised by the manufacturer	

### 6.3.1.1. Visual test of the lifting bag



**The next test may be carried out outdoor only. Observe a safety distance between the persons present and the test object, as well as between the neighbouring buildings and the test object.**

Connect the unloaded lifting bag as specified in Chapter 5.3. Inflate the lifting bag to the pressure 0.2 x working pressure. Check visually for any unusual bulges, punctures, cuts or any other mechanical damages. Using a brush, apply some soapy water over the entire bag surface including the connection. Visually check sealing of the lifting bag and connection.

### 6.3.1.2. Function test of the sealing bag



**The next test may be carried out outdoor only. Observe a safety distance between the persons present and the test object, as well as between the neighbouring buildings and the test object.**

Connect the unloaded lifting bag as specified in Chapter 5.3. Inflate the lifting bag to 0.5 x working pressure. The lifting bag is functional if the pressure in the lifting bag does not drop by more than 10% within an hour.

### 6.3.1.3. Visual test of pressure reducing valve

Visually check for damages on:

- Threads of the filling connection
- Pressure gauges and the maximum working pressure marking
- Protective caps on pressure gauges
- Relief valve
- Connecting hoses for tears, punctures or any other damages such as stiff areas and consequences of contact with acids

### 6.3.1.4. Function test of pressure reducing valve

Attach the pressure reducing valve on a standard compressed-air cylinder of capacity 6 l and pressure 300 bar. The compressed-air cylinder should be full. Shut off the relief valve.

Open the valve on the cylinder. The left pressure gauge should display the pressure 300 bar.

Using a brush, apply some soapy water on the connection between the pressure reducing valve and the cylinder and check sealing. Turn the adjusting valve to reduce the outlet pressure displayed on the right pressure gauge until the value shows 0 bar. Turn the adjusting valve in the opposite direction until the maximum value marked on the right pressure gauge is reached (8 or 10 bar, depends on the type). The adjusting valve should allow setting the value throughout the working area. The adjusting valve should move smoothly throughout the working area.

Using a brush, apply some soapy water on the connector and check sealing of the relief valve.

Connect the hose to the controller. Slowly open the relief valve until it is fully open. The relief valve should move smoothly at all times. The pressure gauge on the controller should display the same value as displayed on the right pressure gauge of the pressure reducing valve. Using a brush, apply some soapy water on the hose of the pressure reducing valve and connections between the hose and pressure reducing valve, as well as the hose and controller. Check sealing of hoses and connections.

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### 6.3.1.5. Visual test of the supply hose

Visually check for damages on:

- Connection couplings
- Connector
- Hoses, any tears, punctures or any other damages such as stiff areas and consequences of contact with acids

### 6.3.1.6. Function test of the supply hose

Connect the controller and lifting bag with the supply hose, see Chapter 5.3.1. Inflate the lifting bag to 0.2 x working pressure. Using a brush, apply some soapy water on connections, supply hose, and check sealing of connections and hoses.

### 6.3.1.7. Visual test of the controller

Visually check for damages on:

- Inlet connecting couplings
- Outlet connecting couplings
- Pressure gauges and the maximum working pressure marking
- Protective caps on pressure gauges\*\*
- Housing\*
- Safety valve

\* *Dual controller*

\*\* *Controller with a ball valve*

### 6.3.1.8. Function test of the controller

Connect the hose of pressure reducing valve, see Chapter 5.3.1, to check the function of the inlet coupling. Connect the controller and the lifting bag with the supply hose, see Chapter 5.3.1, and check the function of the outlet couplings. Move the control levers first into the lifting position and then into the lowering position. Control levers should move smoothly. When the control lever is in the lifting position, the connected lifting bags should lift.



**WARNING: Do not exceed 0.2 x working pressure in the lifting bag.\***

Open and shut the ball valve again. The valve should move smoothly. When the valve is open, the connected lifting bag should lift.



**WARNING: Do not exceed 0.2 x working pressure in the lifting bag \*\*.**

\* *Dual controller*

\*\* *Controller with a ball valve*

### 6.3.1.9. Function test of pressure gauges on the controller

The function of pressure gauges on the controller is tested by means of reference pressure gauges.

### 6.3.1.10. Function test of the safety valve

Connect the pressure reducing valves, see Chapter 5.3.1.

Press the control lever into the lifting position and gradually build up pressure in the controller until the safety valve opens or the value  $1.1 \times$  working pressure is exceeded. (8 or 10 bar, depends on the type). The safety valve functions appropriately if it activates within the range of  $-0 + 10\%$  working pressure of the controller. The activated safety valve emits a characteristic sound.

## 6.4. SERVICE LIFE

The age of the lifting bags is determined on the basis of a serial number: the first two digits stand for the month of manufacture, and the second two digits for the year of manufacture.



Year of manufacture

Month of manufacture

Fig. 6.4: Serial number of the lifting bag

The example in Fig.6.4 shows a lifting bag that was made in January (01) in 2012 (12).



**Lifting bags are made from rubber and thus subject to natural ageing process. Although a visual inspection shows the bag is still in good condition, it should be put out of operation after 15 years, because the material construction could hide signs of ageing.**

## 6.5. TROUBLESHOOTING

Fault	Reason	Remedy
Inlet pressure gauge of pressure reducing valve does not display sufficient pressure.	Empty compressed-air cylinder. Shut-off valve on the cylinder.	Replace the cylinder. Open the valve on the cylinder.
Required pressure cannot be set on the outlet pressure gauge of pressure reducing valve.	Adjusting valve blocked pressure in the cylinder. Adjusting valve failure. Outlet pressure gauge failure.	Briefly (1 s) open the relief valve. Try to set the pressure repeatedly. Replace the pressure reducing valve. Replace the pressure reducing valve.
The hose of pressure reducing valve cannot be correctly inserted in the controller's connecting coupling.	Dirt on the connector or coupling. Connector or coupling are damaged.	Clean the plug and coupling. Replace the pressure reducing valve or controller.
Supply hose cannot be correctly inserted in controller's connecting coupling.	Dirt on connectors or couplings. Connectors or couplings are damaged.	Clean the connector and coupling. Hose or controller.
In spite of the activated control level, the lifting bag does not inflate.	Safety valve failure. Protective screw on the safety valve is unscrewed.* Connector or coupling blocked. The hose of pressure reducing valve and supply hoses are incorrectly connected. The hose of pressure reducing valve or supply hoses are damaged and do not seal.	Replace the controller. Tighten the protective screw on safety valve. Clean the connector or coupling. Check and re-connect the hose of pressure reducing valve and supply hoses. Replace the pressure reducing valve or supply hoses.
In spite of the activated control lever for bag's lowering, the bag does not lower.	Connectors or couplings are blocked.	<p><b>Warning!</b></p>  <p><b>Exercise the utmost caution when carrying out the following procedure.</b></p> <ol style="list-style-type: none"> <li>1. Double-check whether the load is correctly supported to assure stability when deflating the lifting bags.</li> <li>2. Shut-off the valve on the cylinder.</li> <li>3. Deflate all lifting bags connected to the controller.</li> <li>4. Disconnect the supply hose on the lifting bag, which was not deflated, be very careful.</li> <li>5. If the lifting bag still does not deflate, clean the connector of the lifting bag with a metal needle; be careful and allow a safety distance.</li> </ol>

\* It applies to the controllers with a ball valve or a foot pump.

## 7. 7. WARRANTY CONDITIONS

### 7.1. GENERAL CONDITIONS

- 7.1.1. These warranty conditions apply as of 30 June 2014 for Environmental protection and rescue programme products, manufactured by Savatech (Products). If any provision of this warranty conditions would be contrary to any mandatory legal provisions in any particular jurisdiction, such provision shall apply to a maximum extent as provided for by such mandatory legal provisions.
- 7.1.2. Products which may be sold by Savatech Environmental protection and rescue programme but are not manufactured by it are not covered by this warranty and are sold exclusively with warranties, if any, by their original manufacturer.

### 7.2. MANAGEMENT OF THE PRODUCTS

- 7.2.1. In order to claim a remedy pursuant to this warranty, purchaser must conform to instructions for management of the Products which are available on:  
<http://www.savatech.com/Manuals/index.htm>  
[www.savatech.eu/environmental-protection-and-rescue/manuals](http://www.savatech.eu/environmental-protection-and-rescue/manuals)

### 7.3. WARRANTY

- 7.3.1. Savatech warrants to the purchaser that for the period of twelve (12) months as of delivery of the Products, such Products shall be free from defects in material and workmanship, subject to normal and management of the Products, including, among others, proper storage. For high pressure lifting bags, the warranty period amounts to thirty-six (36) months.
- 7.3.2. This warranty shall be in lieu of any other warranties, express or implied, including, but not limited to, any warranty of merchantability or fitness for a particular purpose.

### 7.4. EXCLUSION OF WARRANTY

- 7.4.1. Warranty shall be excluded in cases where the Products have not been used for the ordinary purpose or have been subject to abnormal conditions such as, but not limited to misuse, mishandling (such as, but not limited to, cuts, tears, vandalism, fire, wilful destruction, improper installation and/or improper maintenance, misapplication), use of unauthorized components or attachments or if adjustments or repairs have been performed by anyone other than Savatech or its authorized agents.
- 7.4.2. Warranty shall also be excluded and Savatech shall not be held liable in case of force majeure circumstances, such as, but not limited to:
- war or threat of war, sabotage, insurrection, riots or requisition;
  - all laws, restrictions, regulations, by-laws, prohibitions or any other measures by the governmental, parliamentary or local bodies;
  - import and export regulations or embargo;
  - strikes, lock-outs or other industrial measures or trade disputes (if including Manufacturer's employees or third party);
  - difficulties with supply of raw materials, work force, fuel, parts or machinery;
  - power blackout, break of machinery.
- 7.4.3. Savatech shall not be held liable for any deficiencies in Products manufactured according to drawings, designs, project drafts and/or specifications provided by the purchaser.
- 7.4.4. Ordinary wear and tear is not covered by this warranty.

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## **7.5. MAKING A WARRANTY CLAIM**

- 7.5.1. Purchaser is obliged to take delivery of the Products and perform an ordinary inspection of the Product upon delivery.
- 7.5.2. Any claim by the purchaser with reference to the Products shall be deemed waived unless submitted in writing to Savatech within the earlier of (I) eight days as of the discovery of the defect, or (II) twelve months as of the date of delivery of the Products or thirty-six (36) months as of delivery of high pressure lifting bags. Discovery of the defect is deemed to have occurred when a defect could have reasonably been detected by the purchaser.
- 7.5.3. Claim must at least contain the following data:  
part number,  
serial number,  
description of defect,  
and must be substantiated by adequate evidence, such as pictures... Upon request, Savatech must be allowed to inspect the Product.
- 7.5.4. To obtain performance under this warranty, any products suspected of having a manufacturing defect in materials or workmanship shall be returned freight prepaid for inspection to SAVATECH d.o.o., Environmental protection and rescue programme, Škofjeloška c. 6, 4000 Kranj, Slovenia.

## 8. ENCLOSURES

### 8.1. BRIEF INSTRUCTIONS ON USING THE SAVATECH LIFTING BAG



Non-compliance with the instructions can result in various injuries. Carefully read the instructions for operation before using the lifting bag.



[www.savatech.eu/environmental-protection-and-rescue/manuals](http://www.savatech.eu/environmental-protection-and-rescue/manuals)

[www.savatech.com/Manuals/index.htm](http://www.savatech.com/Manuals/index.htm)

PERSONAL PROTECTIVE EQUIPMENT:



Always wear personal protective equipment when working with SAVATECH lifting bags. Fire fighters and rescue team members shall wear a complete protective gear specified for their work. Other users shall wear protective helmet, protective goggles and gloves, as well as protective footwear.

TEMPERATURE RANGE:



SAVATECH lifting bags should be used within the temperature range from -20 to + 80 °C. In short cycles, not exceeding 1 hour, they may be exposed to temperatures up to -40°C.

The standard version of SAVATECH lifting bags is NOT intended for use in potentially explosive atmospheres

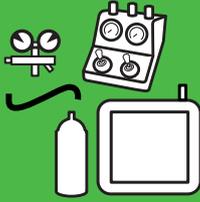
CHOOSING A SUITABLE SAVATECH LIFTING BAG:



For choosing a suitable SAVATECH lifting bag, consider the data on technical and lifting characteristics given in the tables as well as on the labels on lifting bags.



1.step



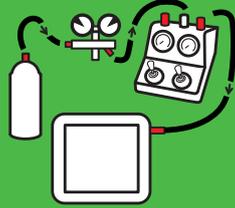
#### PROCEDURE

Bring SAVATECH lifting bags, air source, controller, supply and connecting hoses where required.

#### WARNINGS

Only qualified persons are allowed in the area during preparations for lifting/lowering the load. Other persons should keep away from the area of preparation as well as from the area of actual load lifting/lowering. Check the chosen SAVATECH lifting bag for technical suitability.

2.step



#### PROCEDURE

Connect all the components.

#### WARNINGS

Pay attention to the pressure class of components. The 8 bar and 10 bar systems are not compatible. Use pressure reducing valve if air sources exceed the pressure of 12 bar.

3.step



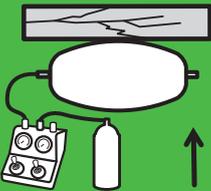
#### PROCEDURE

Insert SAVATECH lifting bags under the load.

#### WARNINGS

Assure stable seating of SAVATECH lifting bag(s) on the solid and cleaned ground; prevent contact with sharp edges of the load. Never place more than two conventional SAVATECH lifting bags SLK, SLK-L and SLK-H on top of each other. Never place more than three flat SAVATECH lifting bags SFB-K on top of each other. Always connect flat SAVATECH lifting bags, which are placed on top of each other, with karabiners.

4.step



#### PROCEDURE

Lifting the load

#### WARNINGS

Use control levers or valves on the controller and the associated pressure gauges for controlling the lifting/lowering procedure. Never exceed the maximum inflation pressure. Never inflate SAVATECH lifting bags without a load to more than 1 bar. Interrupt lifting upon reaching the required lifting height or maximum inflation pressure.

5.step



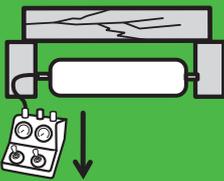
#### PROCEDURE

Place safety supports under the load.

#### WARNINGS

Never work under the load that is not secured with mechanical safety supports.

6.step



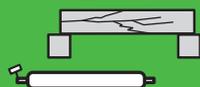
#### PROCEDURE

When the work is finished, deflate the SAVATECH lifting bag.

#### WARNINGS

Keep SAVATECH lifting bags connected to the controller during deflation. Always use discharge levers on the controller for deflating the SAVATECH lifting bag.

7.step



#### PROCEDURE

Remove SAVATECH lifting bags from the place of use, disconnect supply and connecting hoses, weigh them down to squeeze the remaining air out, clean and check them prior to storing.

## 8.2. TEST REPORT: DATA ABOUT THE TEST SPECIMEN AND PERFOR

Testing of lifting bags		Data about test specimen and test performance	
Test date			
Supervisor			
Date of last test			
User name			
Test object			
Accessories			
Product	Serial number	Date of manufacture	Remarks
Remarks:			

### 8.3. TEST REPORT: VISUAL CHECK-UP OF ACCESSORIES

SAVA visual check-up of inflation device			
		YES	NO
1.	Pressure reducing valve		
1.1	Sealing of connection with the cylinder		
1.1.1	Threaded inflation connection on the cylinder undamaged		
1.1.2	Both pressure gauges undamaged, maximum pressure markings in place		
1.2.3	Protective caps of pressure gauges		
1.2.4	Control lever for pressure regulator moves smoothly		
1.2.5	Stop valve undamaged and operates smoothly		
1.2.6	Air hose not torn, punctured or damaged, no stiff areas, consequence of acids, etc.		
1.2.7	No visible damages on inflation connection		
1.2.8	Hose is firmly connected		
2.	Supply hose, 5m, red		
2.1	No visible defects on coupling		
2.2	No visible defects on connection		
2.3	Coupling and connection firmly connected		
2.4	Hose not torn, punctured or damaged, no stiff areas, consequence of acids, etc.		
3.	Supply hose, 10m, blue		
3.1	No visible defects on coupling		
3.2	No visible defects on connection		
3.3	Coupling and connection firmly connected		
3.4	Hose not torn, punctured or damaged, no stiff areas, consequence of acids, etc.		
4.	Controller F = fitting system K = Deadman controller		
4.1	Inlet coupling undamaged and operable		
4.2	Stop valves (plug-in coupling) (F) and control levers (K) operate smoothly, no visible damages		
4.3	Protective cap of pressure gauge available (F)		
4.4	Maximum working pressure marking on pressure gauges (10 bar)		
4.5	No damages on safety valves, washer in place		
4.6	No visible defects on housing (K)		
4.7	No visible defects on outlet couplings, operable		

## 8.4. TEST REPORT: FUNCTION TEST OF ACCESSORIES

Function test		
<b>NOTE:</b> If a doubt arises as to the safe testing of lifting bags, immediately interrupt the test and deliver lifting bags and equipment to the manufacturer for further testing.		
<b>INSTRUCTIONS:</b> Function test may be carried out only after a successful visual test with zero defects.		
Connect the pressure regulator to the compressed-air cylinder. Shut-off the stop valve on the pressure regulator. Open the valve on the compressed-air cylinder.		
	YES	NO
Pressure gauge indicator displays pressure in the cylinder		
Pressure gauge indicator displays reduced pressure		
Pressure can be regulated throughout the area		
Safety valve not activated at maximum pressure		
Stop valve shuts-off and seals at maximum pressure		
No strong pressure build-up within 5 minutes after the pressure is set to 4 bar		
Connect the pressure regulator and the controller with the hose. Open stop valve on pressure regulator. Set the pressure to approximately 4 bar.		
	YES	NO
Air hose and inlet coupling seal airtight		
Connect supply hoses to the controller. Alternately, connect SAVA test pressure gauge with the stop valve on pressure regulator. Set pressure regulator to the maximum pressure. Carefully and slowly, open the ball valve as well as the rotary valve.		
	YES	NO
Both couplings (controller and test pressure gauge) can be engaged or disengaged without difficulty		
When opening the stop/rotary valve, the pressure gauge on the controller displays the pressure equal to the pressure on the test pressure gauge		

## 8.5. TEST REPORT: VISUAL AND FUNCTION TEST OF LIFTING BAGS

Visual and function test of lifting bags		
<b>NOTE:</b> This test refers to the annual visual and function tests. A pressure test, which is to be performed every five years, is carried out separately.		
Lifting bag type	Serial number	Date of manufacture
<b>VISUAL TEST:</b> If dirty, first clean the lifting bag with soapy water.		
	YES	NO
No damages on inflation connection		
No punctures, cuts, torn sections or other damages on the surface or edges of the lifting bag		
<b>NOTE:</b> If a doubt arises as to the safe testing of lifting bags, immediately interrupt the test and deliver lifting bags and equipment to the manufacturer for further testing.		
<b>FUNCTION TEST:</b>		
Connect the lifting bag to the inflation device and inflate it up to pressure 4 bar		
	YES	NO
No atypical bulges on the lifting bag		
No punctures, cuts, torn section or any other damages on the lifting bag		
Slowly and carefully, build up pressure in the lifting bag to the maximum working pressure		
	YES	NO
No atypical bulges on the lifting bag		
Pressure drop after three minutes less than 10%		
<b>EVALUATION</b>		
<b>Lifting bag is suitable for further use</b>		
<b>Lifting bag is permanently unsuitable for use</b>		
<b>Date/Signature</b>		





**Savatech, d.o.o.**  
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and Tyres

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