TRELLEBORG

Instructions for use:

High-Pressure Lifting Bags

Sawa

TABLE OF CONTENTS

TABLE OF CONTENTS

1.0. IDENTIFICATION

1.1. TYPE OF PRODUCT

- SAVA conventional lifting bags: SLK, SLK-H and SLK-L,
- Flat lifting bags SAVA: SFB-K and SFB-H

Fig. 1.1: Lifting bag label with explanation
All SAVA high-pressure lifting bags comply with EN 13731 standard.

1.2. MANUFACTURER

TRELLEBORG

Sava

Trelleborg SLOVENIJA, d.o.o.
Manufacturing and Marketing of Industrial Rubber Products and Tyres

Environmental Protection Products

Škofjeloška cesta 6
4502 Kranj
Slovenija

Tel: +386 (0)4 206 6388
Telefax: +386 (0)4 206 6390

info.eko@trelleborg.com
www.savatech.eu
www.savatech.com

2.0. PRODUCT DESCRIPTION

2.1. BASIC FUNCTIONS AND APPLICATION AREAS

SAVA conventional and flat lifting bags are intended for lifting, lowering, positioning, separating and moving of loads weighing up to 88 t (97 US t), mainly in rescue operations, but also in industrial applications.

2.2. BASIC DATA

Table 1: SAVA conventional lifting bags (the SLK family)

8 bar - SLK

TYPE	PART NUMBER	DIMENSIONS			WEIGHT	WORKING PRESSURE	AIR REQUIREMENT	MAX. LIFTING CAPACITY	MAX. LIFTING HEIGHT
		LENGTH	WIDTH	HEIGHT					
		[cm] / [inch]	**[cm]** / [inch]	**[cm]** / [inch]	**[kg]** / [lbs]	**[bar]** / [psi]	**[l]** / [cu./Ft.]	**[t]** / [US Tons]	**[cm]** / [inch]
SLK 1	77973	**15** / 6″	**15** / 6″	**2.5** / 1″	**0.55** / 1.2	**8** / 116	**5** / 0.2	**1.1** / 1.2	**8** / 3.1″
SLK 3	77974	**22.5** / 9″	**22.5** / 9″	**2.5** / 1″	**1.25** / 3	**8** / 116	**15** / 0.5	**2.7** / 3	**13** / 5.1″
SLK 6	77975	**30** / 12″	**30** / 12″	**2.5** / 1″	**2** / 4	**8** / 116	**42** / 1.5	**5.5** / 6.1	**16** / 6.3″
SLK 10	76734	**38** / 15″	**38** / 15″	**2.5** / 1″	**3,5** / 8	**8** / 116	**86** / 3.0	**10.1** / 11.1	**21** / 8.3″
SLK 14	76735	**45** / 18″	**45** / 18″	**2.5** / 1″	**5** / 11	**8** / 116	**152** / 5.4	**13.5** / 14.9	**25** / 9.8″
SLK 21	76736	**55** / 22″	**55** / 22″	**2.5** / 1″	**7** / 15	**8** / 116	**296** / 10.5	**21.1** / 23.2	**30** / 11.8″
SLK 25	76737	**61** / 24″	**61** / 24″	**2.5** / 1″	**9** / 20	**8** / 116	**416** / 14.7	**25.2** / 27.7	**34** / 13.4″
SLK 33	76738	**69** / 27″	**69** / 27″	**2.5** / 1″	**11** / 24	**8** / 116	**621** / 21.9	**33** / 36.3	**38** / 15″
SLK 45	76739	**78** / 31″	**78** / 31″	**2.5** / 1″	**14** / 31	**8** / 116	**921** / 32.5	**44.6** / 49.1	**42** / 16.5″
SLK 55	76794	**87** / 34″	**87** / 34″	**2.5** / 1″	**18** / 40	**8** / 116	**1305** / 46.1	**55** / 60.5	**47** / 18.5″
SLK 70	573241	**94.5** / 37″	**94.5** / 37″	**2.5** / 1″	**22.5** / 50	**8** / 116	**1505** / 53.2	**70.4** / 77.4	**52** / 20.5″

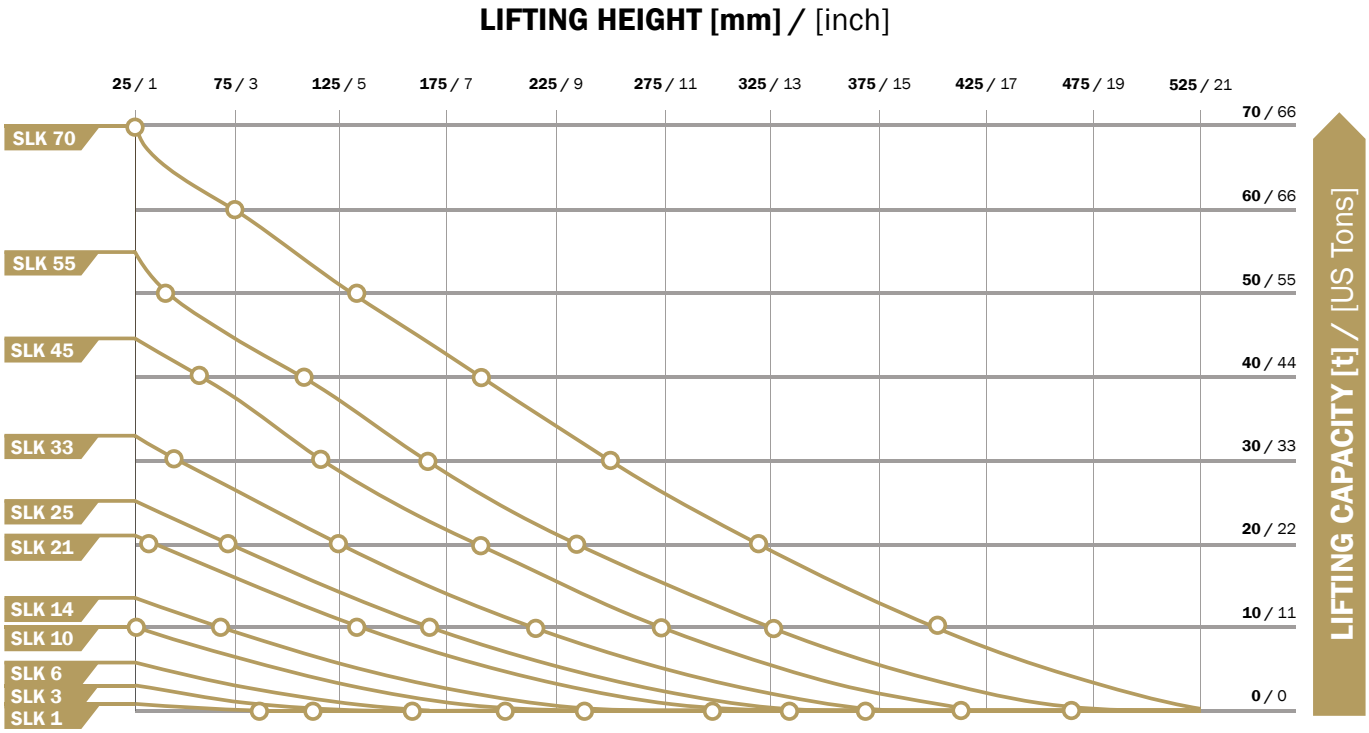


Fig 2.1: Maximum lifting capacity of conventional SAVA lifting bag SLK, depending on the lifting height

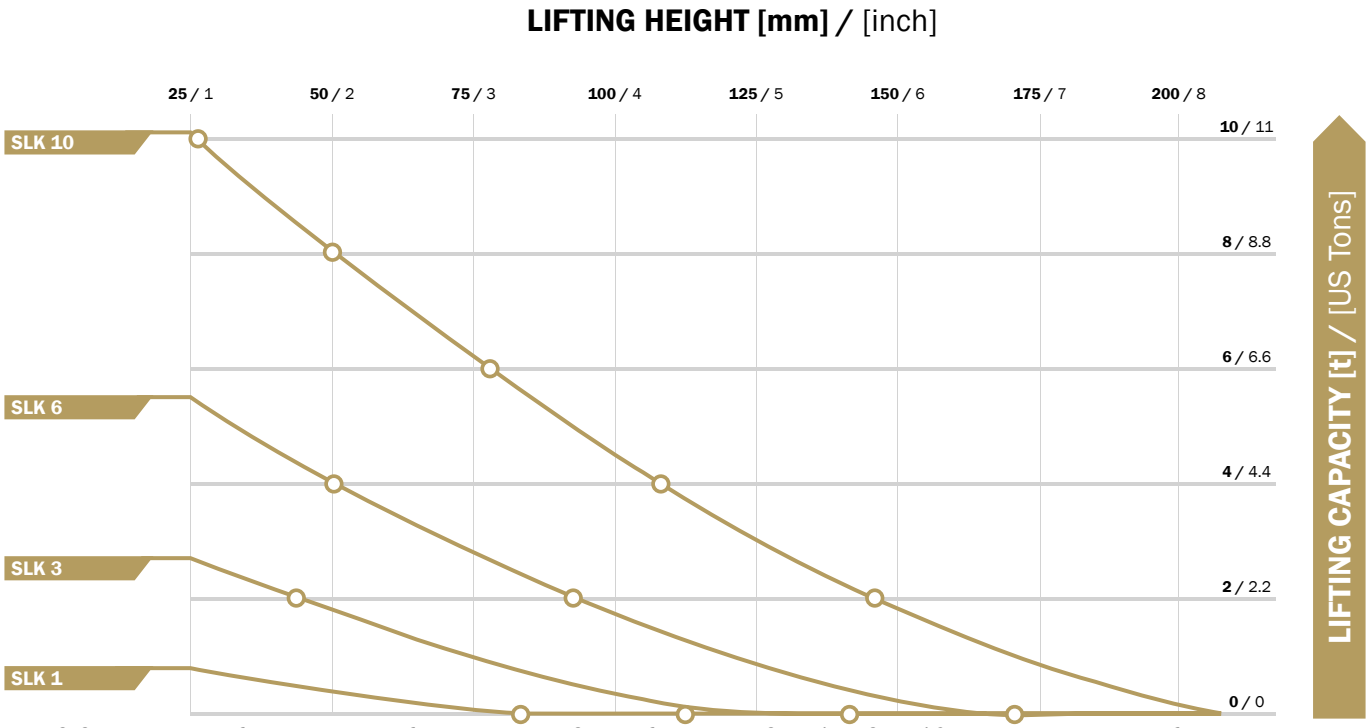


Fig. 2.2: Maximum lifting capacity of conventional SAVA lifting bags SLK 1 to SLK 10 depending on the lifting height.

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

10 bar - SLK-H

TYPE	PART NUMBER	DIMENSIONS			WEIGHT	WORKING PRESSURE	AIR REQUIREMENT	MAX. LIFTING CAPACITY	MAX. LIFTING HEIGHT
		LENGTH	WIDTH	HEIGHT					
		[cm] / [inch]	**[cm]** / [inch]	**[cm]** / [inch]	**[kg]** / [lbs]	**[bar]** / [psi]	**[l]** / [cu./Ft.]	**[t]** / [US Tons]	**[cm]** / [inch]
SLK- H 1	291240	**15** / 6″	**15** / 6″	**2.5** / 1″	**0.55** / 1.2	**10** / 145	**7** / 0.3	**1.2** / 1.3	**8** / 3.1″
SLK- H 4	291241	**22.5** / 9″	**22.5** / 9″	**2.5** / 1″	**1.25** / 3	**10** / 145	**19** / 0.7	**3.3** / 3.6	**13** / 5.1″
SLK- H 7	291242	**30** / 12″	**30** / 12″	**2.5** / 1″	**2** / 4	**10** / 145	**52** / 1.9	**6.8** / 7.5	**16** / 6.3″
SLK- H 12	291243	**38** / 15″	**38** / 15″	**2.5** / 1″	**3.5** / 8	**10** / 145	**106** / 3.8	**12.1** / 13.3	**21** / 8.3″
SLK- H 17	291244	**45** / 18″	**45** / 18″	**2.5** / 1″	**5** / 11	**10** / 145	**186** / 6.6	**16.6** / 18.3	**25** / 9.3″
SLK- H 26	291245	**55** / 22″	**55** / 22″	**2.5** / 1″	**7** / 15	**10** / 145	**362** / 12.8	**26.3** / 28.9	**30** / 11.8″
SLK- H 32	291246	**61** / 24″	**61** / 24″	**2.5** / 1″	**9** / 20	**10** / 145	**508** / 18.0	**31.8** / 35	**34** / 13.4″
SLK- H 41	291247	**69** / 27″	**69** / 27″	**2.5** / 1″	**11** / 24	**10** / 145	**759** / 26.8	**41.3** / 45.4	**38** / 15″
SLK- H 56	291248	**78** / 31″	**78** / 31″	**2.5** / 1″	**14.1** / 31	**10** / 145	**1122** / 39.7	**55.8** / 61.4	**42** / 16.5″
SLK- H 69	291249	**87** / 34″	**87** / 34″	**2.5** / 1″	**18.2** / 40	**10** / 145	**1595** / 56.4	**68.7** / 75.6	**47** / 18.5″
SLK- H 88	291250	**94.5** / 37″	**94.5** / 37″	**2.5** / 1″	**22.7**/ 50	**10** / 145	**1650** / 58.3	**88** / 96.8	**52** / 20.5″

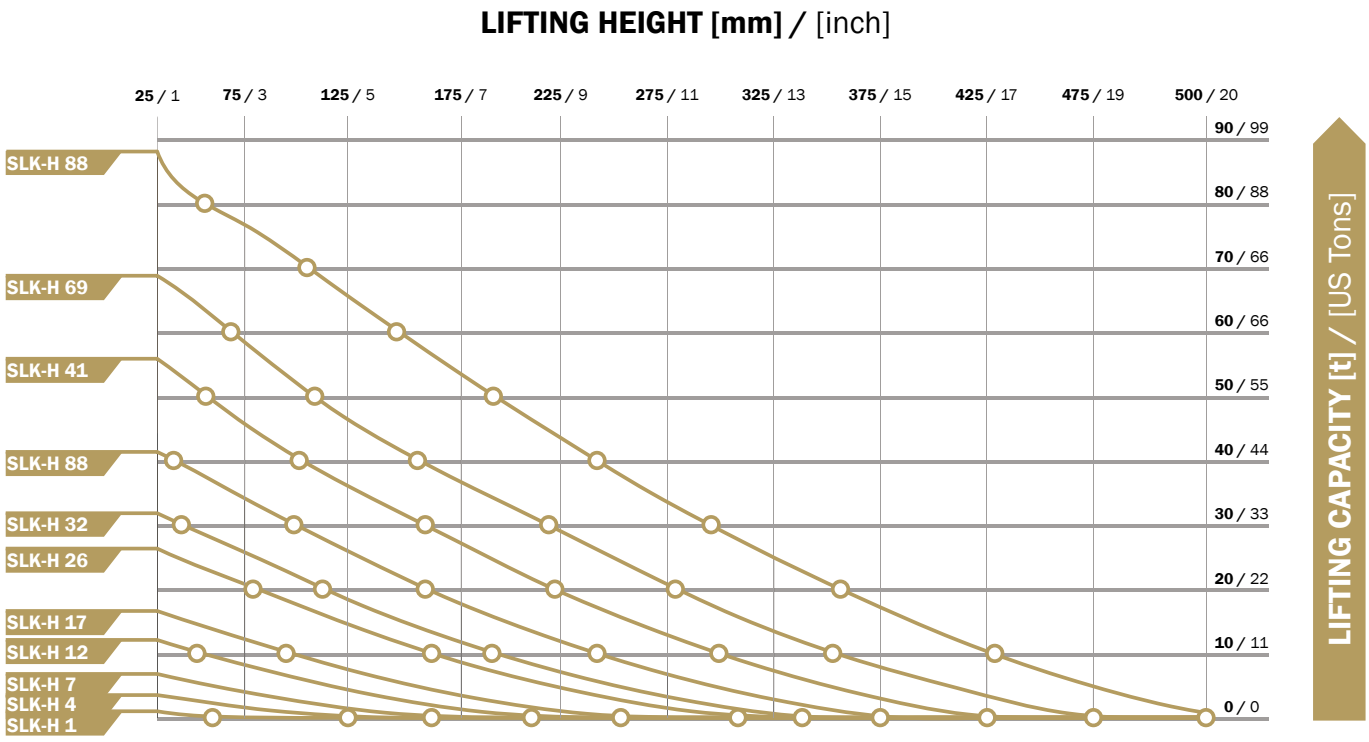


Fig. 2.3: Maximum lifting capacity of conventional SAVA SLK-H lifting bag, depending on the lifting height

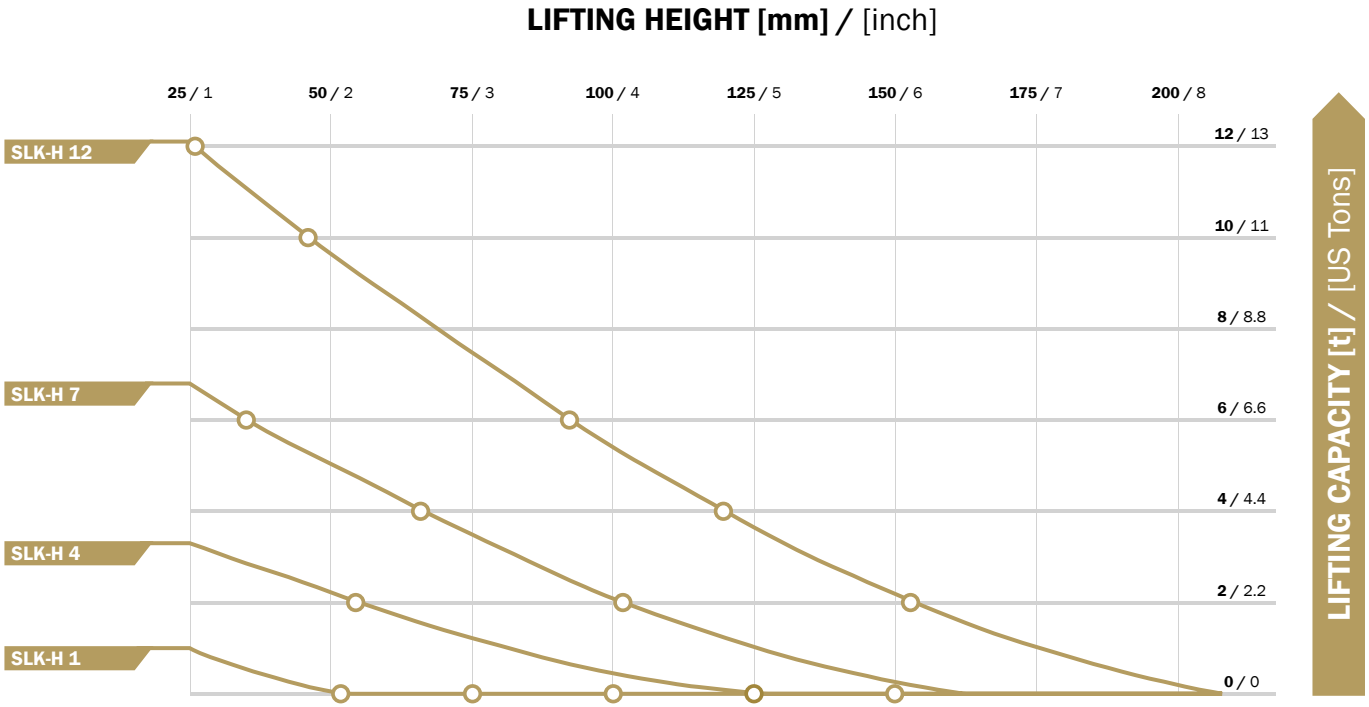


Fig. 2.4: Maximum lifting capacity of conventional SAVA SLK-H 1 to SLK-H 12 lifting bags, depending on the lifting height

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

8 bar - SLK-L

TYPE	PART NUMBER	DIMENSIONS			WEIGHT	WORKING PRESSURE	AIR REQUIREMENT	MAX. LIFTING CAPACITY	MAX. LIFTING HEIGHT
		LENGTH	WIDTH	HEIGHT					
		[cm] / [inch]	**[cm]** / [inch]	**[cm]** / [inch]	**[kg]** / [lbs]	**[bar]** / [psi]	**[l]** / [cu./Ft.]	**[t]** / [US Tons]	**[cm]** / [inch]
SLK-L 9	519833	**45** / 18″	**30** / 12″	**2.5** / 1″	**3.3** / 7.3	**8** / 116	**95** / 3.4	**8.9** / 9.8	**19** / 7.5″
SLK-L 13	519834	**50** / 20″	**37.5** / 15″	**2.5** / 1″	**4.5** / 10	**8** / 116	**170** / 6.0	**13.2** / 14.5	**23** / 9.1″
SLK-L 20	519837	**75** / 30″	**37.5** / 15″	**2.5** / 1″	**6.5** / 14.3	**8** / 116	**270** / 9.5	**20.2** / 22.2	**23** / 9.1″
SLK-L 24	77983	**102** / 40″	**32** / 13″	**2.5** / 1″	**7.8** / 17.2	**8** / 116	**220** / 7.8	**24** / 26.4	**20** / 7.9″

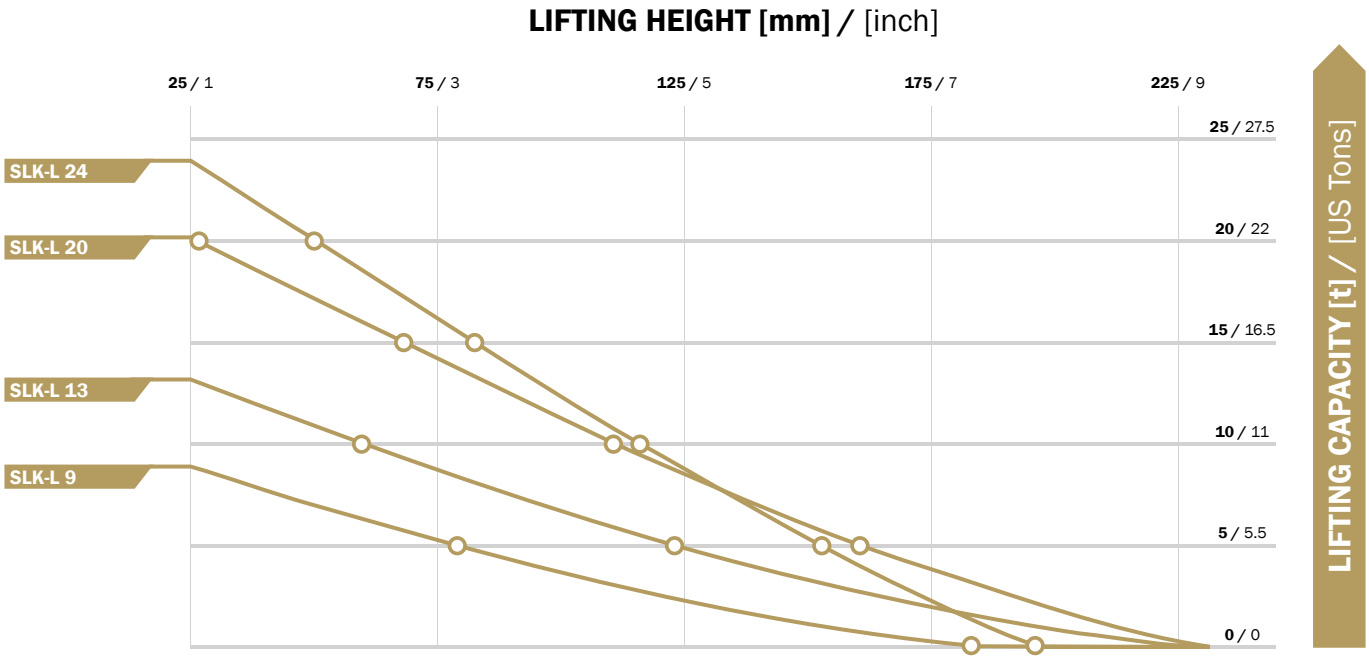


Fig. 2.5: Maximum lifting capacity of lifting bag SAVA SLK-L, depending on the lifting height

Table 4: FLAT BAG lifting bags SAVA (the SFB-K family)

8 bar - SFB-K

TYPE	PART NUMBER	DIMENSIONS			WEIGHT	WORKING PRESSURE	AIR REQUIREMENT	MAX. LIFTING CAPACITY	MAX. LIFTING HEIGHT	MAX. LIFTING CAPACITY AT MAX. LIFTING HEIGHT
		LENGTH	WIDTH	HEIGHT						
		[cm] / [inch]	**[cm]** / [inch]	**[cm]** / [inch]	**[kg]** / [lbs]	**[bar]** / [psi]	**[l]** / [cu./Ft.]	**[t]** / [US Tons]	**[cm]** / [inch]	**[t]** / [US Tons]
SFB-K 7/17	519883	**55** / 22″	**55** / 22″	**2.5** / 1″	**7.3** / 16	**8** / 116	**224** / 7.9	**21.1** / 23.2	**17** / 6.7	**6.7** / 7.4
SFB-K 10/17	519884	**61** / 24″	**61** / 24″	**2.5** / 1″	**9.2** / 20	**8** / 116	**350** / 12.4	**25.2** / 27.7	**17** / 6.7	**9.5** / 10.5
SFB-K 20/17	519885	**78** / 31″	**78** / 31″	**2.5** / 1″	**14.5** / 32	**8** / 116	**520** / 18.4	**44.6** / 49.1	**17** / 6.7	**20.2** / 22.2
SFB-K 33/17	519886	**91.5** / 36″	**91.5** / 36″	**2.5** / 1″	**20.6** / 45	**8** / 116	**810** / 28.6	**64** / 70.4	**17** / 6.7	**33.3** / 36.6

Fig. 2.6: Maximum lifting capacity of FLAT BAG SAVA SFB-K lifting bag, depending on the lifting height

Table 5: FLAT BAG lifting bags SAVA (the SFB-H family)

10 bar - SFB-H

TYPE	PART NUMBER	DIMENSIONS			WEIGHT	WORKING PRESSURE	AIR REQUIREMENT	MAX. LIFTING CAPACITY	MAX. LIFTING HEIGHT	MAX. LIFTING CAPACITY AT MAX. LIFTING HEIGHT
		LENGTH	WIDTH	HEIGHT						
		[cm] / [inch]	**[cm]** / [inch]	**[cm]** / [inch]	**[kg]** / [lbs]	**[bar]** / [psi]	**[l]** / [cu./Ft.]	**[t]** / [US Tons]	**[cm]** / [inch]	**[t]** / [US Tons]
SFB-H 8/17	291294	**55** / 22″	**55** / 22″	**2.5** / 1″	**7.4** / 16	**10** / 145	**280** / 9.9	**26.4** / 29	**17** / 6.7″	**8.1** / 8.9
SFB-H 12/17	291295	**61** / 24″	**61** / 24″	**2.5** / 1″	**9.2** / 20	**10** / 145	**437.5** / 15.5	**31.5** / 34.7	**17** / 6.7″	**11.9** / 13.1
SFB-H 25/17	291296	**78** / 30″	**78** / 30″	**2.5** / 1″	**14.5** / 32	**10** / 145	**650** / 23	**55.8** / 61.3	**17** / 6.7″	**25.3** / 27.8
SFB-H 42/17	291297	**91.5** / 36″	**91.5** / 36″	**2.5** / 1″	**20.5** / 45	**10** / 145	**1012.5** / 35.8	**80** / 88	**17** / 6.7″	**41.6** / 45.8

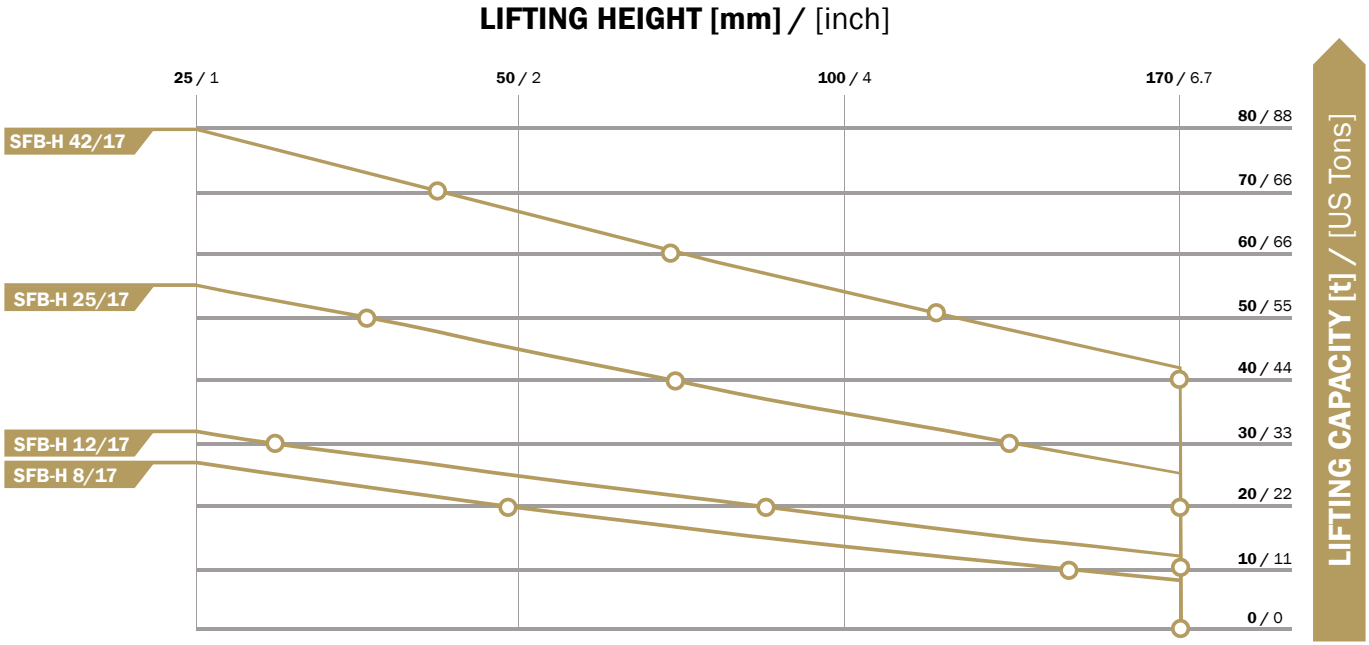


Fig. 2.7: Maximum lifting capacity of FLAT BAG SAVA SFB-H lifting bag, depending on the lifting height

2.3. ENVIRONMENTAL CONDITIONS AND RESTRICTIONS OF USE

Application temperature range: –20 to +80 °C (–4 to +176 °F). The use of the product at temperatures below –20 °C (–4 °F), but not lower than –40 °C (–40 °F), is limited to 1 hour, and to 30 minutes at temperatures above +80 °C (+176 °F), in which case the temperature may not exceed +100 °C (+212 °F).

Standard version of SAVA lifting bags is NOT intended for use in potentially explosive atmospheres (as defined in the ATEX directives); such atmospheres require special types of SAVA lifting bags. Further information on special types of lifting bags is available from the manufacturer.

2.4. PERSONAL PROTECTIVE EQUIPMENT AND SAFETY

Always wear personal protective equipment when working with SAVA 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.

3.0. DEFINITIONS

Bearing surface: the bag's surface in contact with the load or the object during lifting; it determines the lifting capacity of a bag.

Connecting hoses connect the controller and lifting bags.

Contact surface: the entire upper or bottom surface of the bag.

Controller: a device for supplying, discharging and supervision over the filling media in lifting bags.

Conventional lifting bag: a high-pressure lifting bag that changes shape and size of the bearing surface when inflated with air or water.

Flat lifting bag lifts evenly almost over the entire surface during inflation with air or other media; thanks to its construction, it also keeps the shape and size of bearing surface.

Inflation connector: a connector on the bag to which supply hoses are connected.

Lifting capacity: the maximum weight of a load that can be lifted with the bag at a specified pressure.
Permissible pressure: the maximum inflation pressure in the bag during operation, specified by the manufacturer.

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

Pressure vessel: A container holding the compressed air, which is used as air source to inflate the system of lifting bags.

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

Supply hose: a hose between the air source and the controller.

Working pressure: the pressure in the bag during operation.

4.0. PREPARATION OF PRODUCT FOR USE

4.1. TRANSPORT AND STORING

SAVA lifting bags are packed in cardboard boxes with their sensitive parts additionally protected. During transport, lifting bags should be placed horizontally or vertically. Bending or breaking of the bag is not allowed. SAVA lifting bags should be stored 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

Read the instructions before using the product!

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 SAVA lifting bags could get damaged.

4.4. DISPOSAL OF PACKAGING

Packaging is made of fully recyclable cardboard, which is why it should not be disposed of permanently. Dispose it in waste bins for recycled paper or designated bins for cardboard packaging.

4.5. STORAGE AND PROTECTION OF PRODUCT NOT IN USE

SAVA lifting bags should be stored in a dry and dark space

Storage temperature: +5 °C (+41 °F) to +25 °C (+77 °F).

We recommend that you store SAVA lifting bags horizontally with the inflation connector facing forward to be easily seen when moving the lifting bag and be able to protect it from damages.
If SAVA lifting bags are stored upright, we recommend that you fix them on the surface (a wall) to protect them from bending. The inflation connector should face upwards.
It is recommended that SAVA lifting bags are stored in PVC pouches to minimise various environmental influences on the product during storage.

4.6. STORAGE OF INSTRUCTIONS AND PERIODIC TEST REPORTS

Brief instructions and manufacturer's test report are enclosed with every SAVA lifting bag.

Keep the instructions and periodic test reports throughout the service life of SAVA lifting bags!

5.0. OPERATING INSTRUCTIONS

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 IF IT IS NOT PROTECTED WITH MECHANICAL SAFETY SUPPORTS!

- **Never exceed the maximum inflation pressure.**
- **Never place more than two SAVA conventional bags on top of each other.**
- **Never place more than three SAVA flat bags on top of each other.**
- **Never exceed the pressure of 1 bar (14.5 psi) if no load is placed on SAVA lifting bag.**
- **Inflate SAVA lifting bag until a required or maximum height or maximum working pressure is reached.**
- **Improper use of SAVA 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 SAVA lifting bags.**
- **Lifting bags or accessories not tested in accordance with the check-up cycles, specified in Chapter 6.3.1, may not be used until they have successfully passed the specified tests.**

5.1.1. CARRYING SAVA LIFTING BAGS

Carry SAVA lifting bags in an upright position. Make sure the inflation connector always faces upwards to prevent damage in case of falling.
Larger and heavier SAVA 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 7/17, SFB-K 10/17, SFB-K 20/17, SFB-K 33/17,
- SFB-H 8/17, SFB-H 12/17, SFB-H 25/17, SFB-H 42/17,

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

5.1.2. WORKING ENVIRONMENT

TEMPERATURA PREDMETA DVIGANJA
If the surface temperature of the object to be lifted exceeds 55 °C (131 °F), protect SAVA lifting bag's surface in contact with the object by means of a fibreboard or rubber-coated steel board. A lifting bag can be damaged when exposed to heat. SAVA lifting bags preserve their lifting capacity and material properties up to the lowest permissible temperature of – 20 °C (–4 °F).

LIGHTING IN THE PLACE OF WORK
It is dangerous to work in the dark, even though SAVA lifting bags are simple to handle. Make sure that the place of work is properly illuminated and not in the shade. We recommend the use of additional lights when visibility is significantly poorer due to shade, even during the day. Do not use an open flame for lighting in the dark.

RESTRICTED AREA - AUTHORISED PERSONNEL ONLY
Only qualified personnel are allowed to be present in preparations for load lifting /lowering. Other persons should keep out of the area where preparations for lifting and the actual lifting/ lowering procedure take place. If additional risks are a threat to people and the environment (e.g. an outbreak of fire due to a fuel leakage), professional personnel must carry out all the required precautionary actions to minimise such risks.

FIRE AREAS
SAVA lifting bags may be used in a fire area only after the contact temperature between the load and the ground drops under 55 °C (131 °F).

5.2. CHOOSING A SUITABLE SAVA LIFTING BAG

The following data is required to be able to choose a suitable SAVA 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, 2.4, 2.5, 2.6 and 2.7, in choosing a suitable SAVA lifting bag.

An example:
A load of 10 t (11 US t) is to be lifted to the height of 150 mm (6") using one SAVA lifting bag.
Considering Fig. 2.1., the conventional lifting bags SAVA SLK 33, SLK 45, SLK 55 or SLK 70 meet the requirements. The lifting capacity of SAVA lifting bag SLK 25 is not sufficient for reaching the height of 150 mm (6").
Conventional lifting bags SAVA SLK-H 32, SLK-H 41, SLK-H 56, SLK-H 69 or SLK-H 88 also meet the requirements for this application, as shown in Fig 2.3.

As clearly shown in Fig.2.5, none of SAVA lifting bags SLK-L is suitable for this application.
SAVA flat lifting bags SFB-K (Fig 2.6) or SFB-H (Fig. 2.7), whose lifting capacity is practically independent of a respective lifting height, can be used as well. Since the required lifting height amounts to 150 mm (6"), two SAVA lifting bags should be placed on top of each other, as shown in Chapter 5.4.2.2. Lifting bags SFB-K 12/17, SFB-K 20/17, SFB-K 33/17, SFB-H 12/17, SFB-H 25/17 and SFB-H 42/17 meet the requirements regarding sufficient lifting capacity.

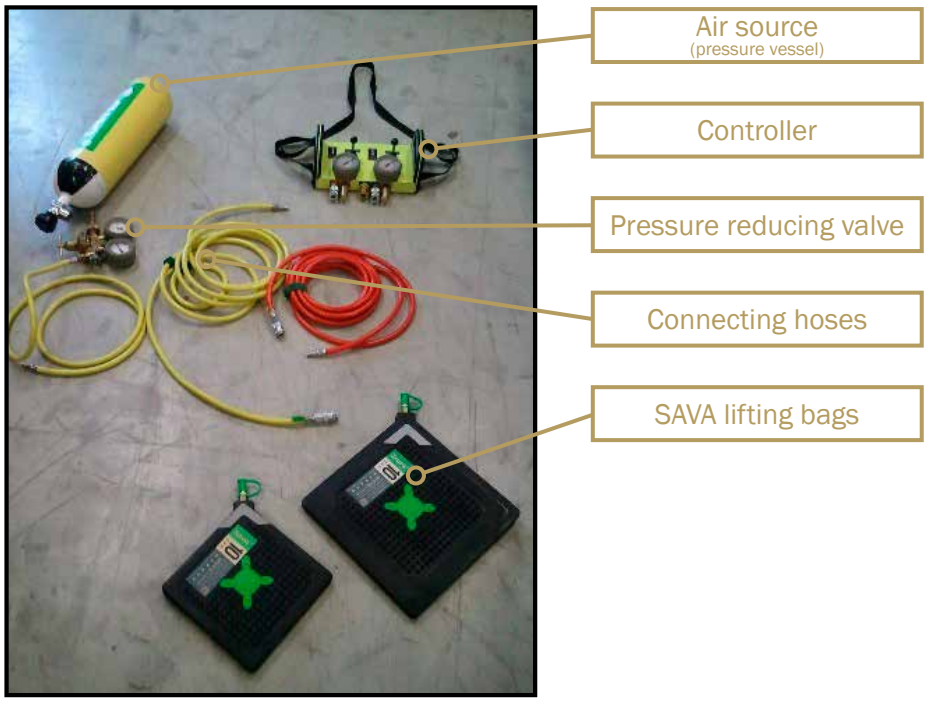
5.3. INFLATION SYSTEM FOR SAVA LIFTING BAGS

- **SAVA lifting bags 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 SAVA lifting bags.**
- **Never inflate SAVA lifting bags, which are not loaded, to more than 1 bar (14.5 psi).**
- **Inflate SAVA lifting bags until the required or maximum lifting height or maximum working pressure is reached.**

5.3.1. PREPARING SAVA LIFTING BAG FOR LIFTING

To lift loads using SAVA lifting bags, the following is needed:

1. air source,
2. pressure reducing valve (if the air source pressure exceeds 12 bar (174 psi),
3. connecting hoses,
4. controller,
5. SAVA lifting bag.



5.1: System components for load lifting with SAVA lifting bags

Always use the above-mentioned components when lifting loads with SAVA lifting bags.

If compressed air contains oil, use the oil separator.

Fig. 5.2: Positioning a SAVA lifting bag on site

Step 1: Position SAVA lifting bag on site
Place SAVA lifting bag on a designated and previously prepared site. Follow the rules defined in Chapters 5.1 and 5.2. and use mechanical supports for load stabilisation

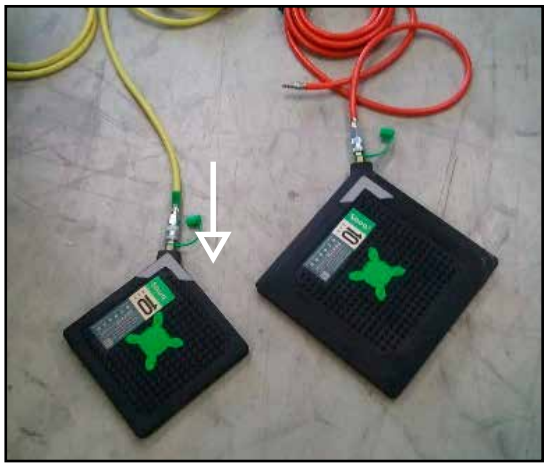


Fig. 5.3: Connect the hoses to the SAVA lifting bag

Step 2: Connect the hoses to SAVA lifting bag
Connecting hoses are of different colours to prevent confusion during use. If several lifting bags are used, connect each SAVA bag with a hose of different colour. Hoses are equipped with double-lock safety couplings.
Connect the hose to SAVA 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 snaps into place.

Fig. 5.4: Connect the connecting hoses to the controller

Step 3: Connect the connecting hoses to the controller
Connect the hose from SAVA 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 they are not squeezed or bent!

Step 4: Prepare the air source
A compressed-air cylinder is the most frequently used air source for inflating lifting bags.
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 (174 psi);
- the supply hose connector for connection to the controller should correspond to a coupling of type 26.

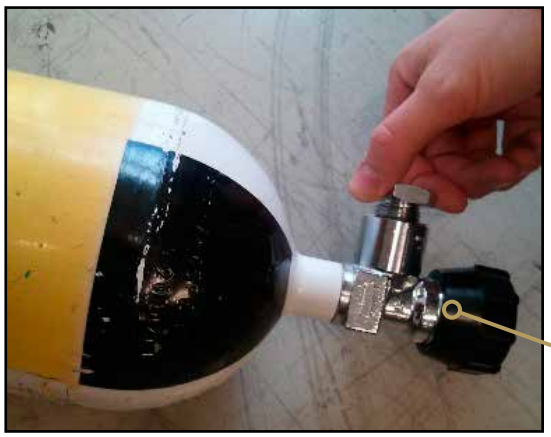


Fig. 5.5: Remove the safety plug from pressure vessel

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.

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

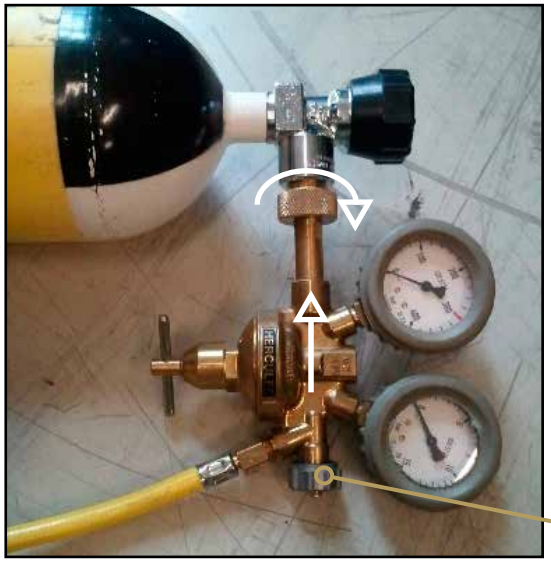


Fig. 5.6: Attach pressure reducing valve

Step 4.2: Attach the pressure reducing valve on pressure vessel

Shut-off the relief valve on pressure reducing valve.

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

When pressure vessel lies on the ground, position the valve so as to protect it from any damages.

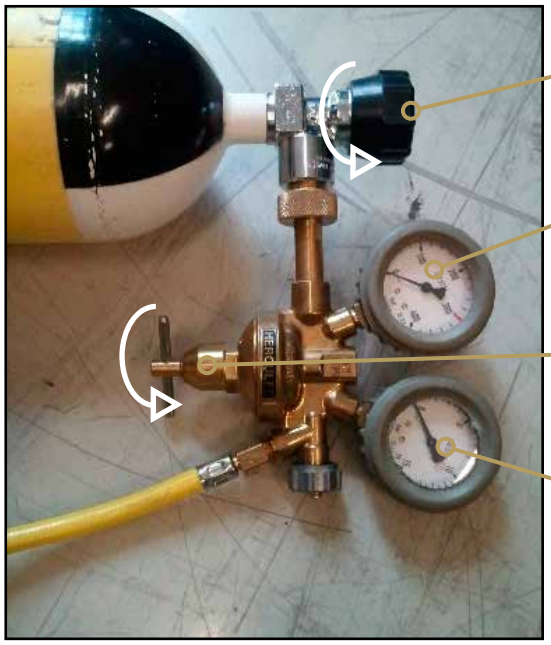


Fig. 5.7: Set pressure reducing valve

Fig. 5.8: Connect the supply hose to the controller

Step 5: Connect the supply hose to the controller
Connect the hose connector to the inlet air supply coupling to the air source supply on the controller; see the arrow in Fig. 5.8. If correctly inserted, the coupling on the controller snaps into place. Move the coupling housing by 180° left or right to lock the coupling.

Fig. 5.9: Relieve the pressure reducing valve

Step 6: Relieve the pressure by opening the pressure reducing valve
Release the pressure into the controller by turning the relief valve anti-clockwise.

5.3.2. WORKING WITH CONTROLLERS

Always monitor the pressure on the respective pressure gauge, the behaviour of the lifting bag and the load during inflation.

If the allowable pressure in the SAVA lifting bag is exceeded, the pressure reducing valve is activated, releasing the pressure.

5.3.2.1. Deadman controllers

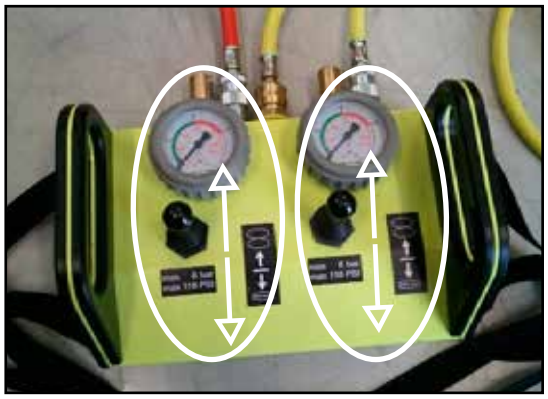


Fig. 5.10: Dual deadman controller - metallic

A deadman controller allows simultaneous control of one, two or three SAVA lifting bags, depending on the version used. A control lever under the respective pressure gauge is used to operate the controller. When the control lever is in its upper position, the pressure in the connected SAVA lifting bag builds up. When the control lever is in its lower position, the pressure in the connected SAVA lifting bag decreases. When the lever is released, it returns to its home position. The valve for filling and discharge is closed.

There are three versions of deadman controller available:

Deadman controller –metallic

Fig. 5.11: Deadman controller – metallic

Deadman controller – plastic

Fig. 5.12: Deadman controller - plastic

Deadman controller in a carrying case

Fig. 5.13: Deadman controller in a carrying case

5.3.2.2. Fitting controllers or foot-operated pumps

Tighten the protective screw on the safety valve on a safety valve of the fitting controller or a foot pump, before air is supplied and the pressure in the connected SAVA lifting bag builds up, see Fig. 5.14.

The pressure in the connected SAVA lifting bag builds up if the ball valve of the controller is opened.

Fig. 5.14: Fitting controller

When using the controller with a foot pump, the pressure in the SAVA lifting bag builds up by activating the foot pump.
To release the air or reduce the pressure in the SAVA lifting bag, unscrew the protective screw on the safety valve, either in the case of the fitting controller or a foot-operated pump.

Fig. 5.15: Tightening or unscrewing the protective screw on the safety valve of foot pump

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

5.3.2.3. Hand-held controllers

Using a hand-held controller, one or two SAVA lifting bags can be operated simultaneously, depending on the version used. The controller is operated with two buttons under the respective pressure gauge: the green button for inflating and the red button for deflating. With the inflation button pressed, the pressure in the connected SAVA lifting bag increases; with the deflation button pressed, the pressure in the SAVA lifting bag drops. When one of the buttons is released, it returns into its closed position.

Fig. 5.16: Hand-held controller

5.3.3. DISCONNECTING SAVA LIFTING BAGS

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

Step 1: Close the valve on pressure vessel
Close the valve on pressure vessel, see Fig. 5.5.

Step 2: Close 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: Release pressure in SAVA lifting bags
Completely release pressure in the connected SAVA lifting bags by means of the controller. See Fig. 5.10.

Step 4: Relieve the supply hose
Completely release air from the supply hose and valves into the connected SAVA lifting bags by means of the controller. Immediately after that, empty SAVA lifting bags again.

Step 5: Disconnecting the supply hose from the controller
Turn the coupling housing until the groove on the housing clicks in, as shown in the bottom right corner of Figure 5.17. Press the coupling housing toward the controller and pull out the hose connector.

Fig. 5.17: 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 pressure vessel. See Fig. 5.6.

Step 7: Attach the safety plug on the compressed-air cylinder
Attach the safety plug on the compressed-air cylinder as shown in Fig. 5.5.

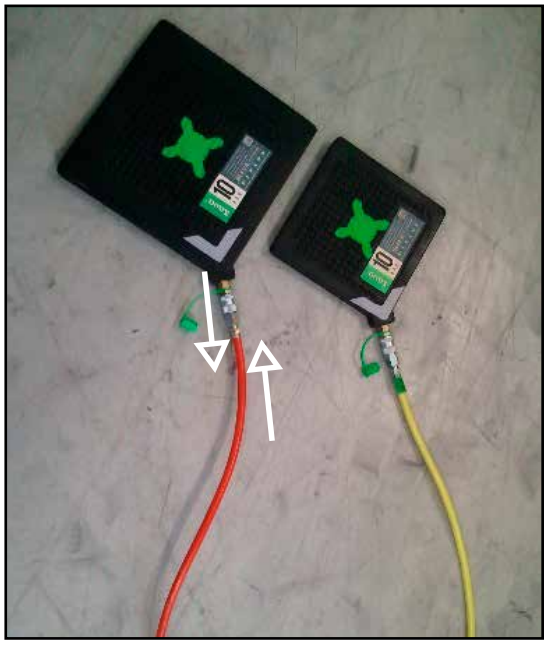
Step 8: Disconnect the connecting hoses from the controller
Insert the hose connector into the plug towards the controller. Press the coupling housing towards the controller. Release the hose connector to release it automatically from the coupling.

When the connecting hoses are disconnected, the pressure is completely relieved.

Fig. 5.18: Disconnect the connecting hoses from the controller

Step 9: Pull SAVA lifting bags from the place of lifting
Pull SAVA lifting bags from the work area and keep them in an easy accessible place.

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



Step 10: Disconnect connecting hoses from the SAVA lifting bag
Press the hose coupling towards SAVA lifting bag. Pull the coupling housing away from SAVA lifting bag and release the hose, after which the connector of SAVA lifting bag is automatically released from the coupling.

Fig. 5.19: Disconnect the connecting hoses from SAVA lifting bag

5.4. LIFTING PROCEDURE

Before you begin the work, check the place where SAVA lifting bag will be set.

Remove any glass fragments, sharp objects and other foreign particles from the place where SAVA lifting bag will be placed to avoid damages or a failure of SAVA lifting bag. Make sure to prevent contact of SAVA lifting bag with any sharp metal edges, tips of brackets, nails, and screws and similar.

If SAVA lifting bags are placed on the spot where danger of slipping exists due to:

- oil stains
- chemicals that could adversely affect rubber properties
- ice or snow,

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

If SAVA lifting 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 the inflated SAVA lifting bag only.

Insert SAVA lifting bag on a prepared place or built support, see Fig. 5.20.

WARNING! It is possible that certain parts of the load are not fixed on the load to be lifted. It is NOT allowed to support the moving parts with the inflated SAVA lifting bag.

Fig. 5.20: Mechanical safety support and marked 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 bearing surface decreases with lifting and so does the lifting capacity. For lifting capacity of SAVA lifting bags depending on the lifting height see Fig. 2.1, 2.2, 2.3, 2.4, 2.5, 2.6 and 2.7.

The lifting capacity is the highest at the beginning of lifting procedure when the lifting height is the lowest (Fig. 5.20). When SAVA lifting bag is inflated, it gradually gets its spherical shape (Fig. 5.21), while the bearing surface and thus the lifting capacity reduce correspondingly.

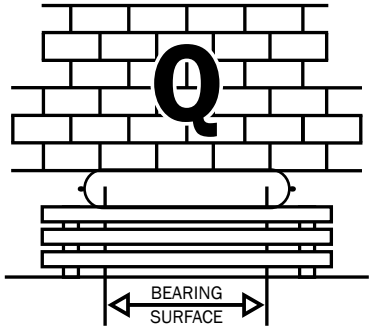


Fig. 5.21: The bearing surface reduces while the lifting height increases

When the lifting height is at its maximum, the bearing surface and lifting capacity of SAVA lifting bags are at their minimum (Fig. 5.22)

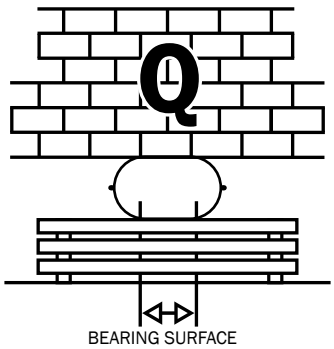


Fig. 5.22: The minimum bearing surface at the maximum lifting height

5.4.1. LIFTING WITH A SINGLE SAVA LIFTING BAG

When a space between the ground and the object to be lifted exceeds 70 mm (2.8”) and only one SAVA lifting bag is available, build a firm and sufficiently high support, leaving just enough space for inserting a non-inflated SAVA lifting bag. The upper surface of the support should be built so as to assure the non-inflated SAVA lifting bag to solidly seat on the support.

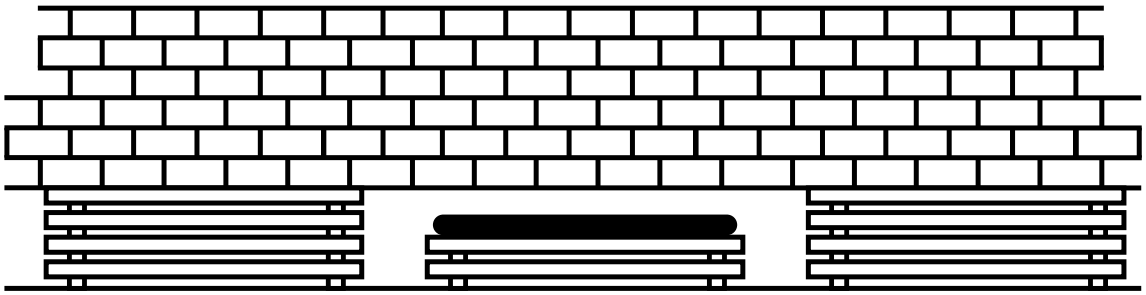


Fig. 5.23: An example of setting up safety supports – non-inflated SAVA lifting bag

Build a safety support on each side of the load to the point where it is impossible to insert another level (Fig. 5.23). In this way, the height, from which the object would fall in case of an abrupt air loss in the SAVA lifting bag or its destruction, is reduced.

Insert SAVA lifting bag in the middle of the support so that the inflation connector is on the front side. Make sure that the upper surface of SAVA bag 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 SAVA lifting bag from under the load.

Slowly inflate SAVA bag to reach the required height and simultaneously add lateral safety supports, see Fig. 5.24.

Do not inflate SAVA lifting bag during adding lateral safety supports.

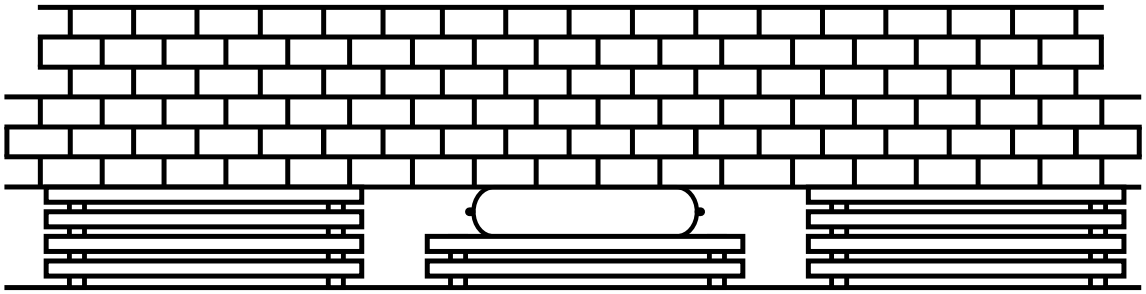


Fig. 5.24: An example of setting up safety supports – an inflated SAVA lifting bag

When the required height is reached, slowly deflate SAVA 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 from under the bag.

When working under the load, this should be completely stabilised, whereas SAVA lifting bag should be completely empty.

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

Lifting capacity can be increased by combining two SAVA lifting bags, which are placed side by side and simultaneously inflated, as shown in Fig. 5.25. The new capacity is double as high as the capacity of the smaller SAVA lifting bag.

Example:
The capacity of combined SAVA lifting bags SLK 10 and SLK 14, side by side and simultaneously inflated amounts to 20 t (22 US t), which is enough to lift a load of 15 t (16.5 US t).

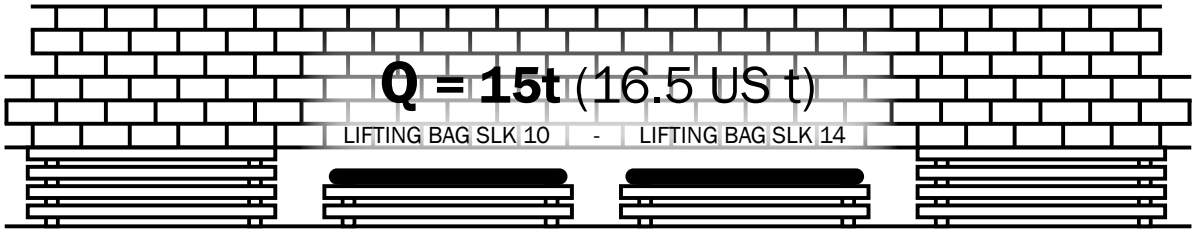


Fig. 5.25: Two SAVA lifting bags placed side by side to increase the lifting capacity

The lifting height can be increased by placing two SAVA lifting bags on top of each other, see Fig. 5.26. and Chapters 5.4.2.1 and 5.4.2.2. The total lifting height of such a combination equals the sum of individual heights of SAVA lifting bags. The load capacity of the combination equals the capacity of the smaller of both SAVA lifting bags.

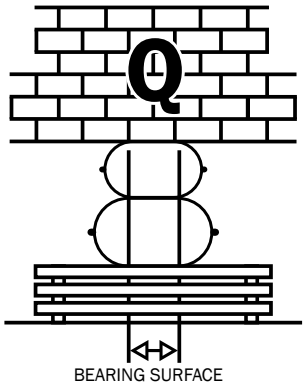


Fig. 5.26: Combined SAVA lifting bags to increase the lifting height

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

Example:
The combination of SAVA lifting bags SLK 10 (21 cm/8") and SLK 14 (25/10"cm) stacked one upon the other enables a total lift of 46 cm (18").

5.4.2.1. SAVA conventional lifting bags

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

When combining lifting bags in order to increase the lifting height, put the smaller SAVA lifting bag in the middle of the bigger one so that both connectors face forward, see Fig. 5.27.

Set up the safety support and base for SAVA lifting bag, follow the procedure for working with a single SAVA lifting bag, see Chapter 5.4.1. Afterwards, completely inflate the upper SAVA lifting bag and, if required, also the lower one, until the required lifting height is reached.

Fig. 5.27: Combining SAVA conventional lifting bags to increase the lifting height

5.4.2.2. SAVA flat lifting bags

MAXIMUM THREE SAVA lifting bags of the SFB-K and SFB-H type may be combined to increase the lifting height.

Combine SAVA lifting bags of the same size only.

When combing lifting bags to increase the lifting height, place SAVA lifting bags on top of each other and make sure that all connectors face forward, see Fig. 5.28. Insert the enclosed straps with karabiners through the handles and connect the lifting bags, as shown in Fig. 5.29. This will prevent SAVA lifting bags from slipping.

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

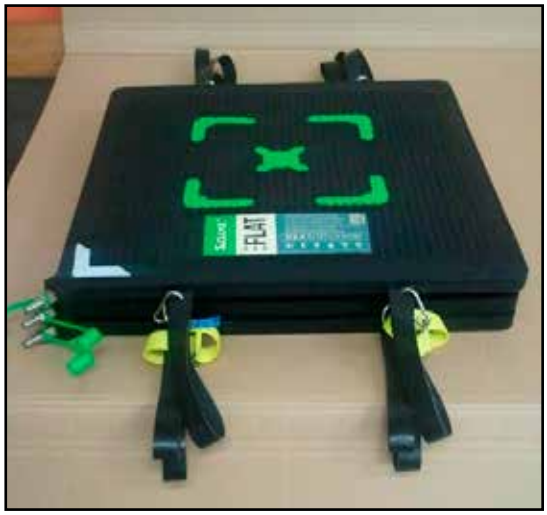


Fig. 5.28: Combining SAVA flat lifting bags to increase the lifting height

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

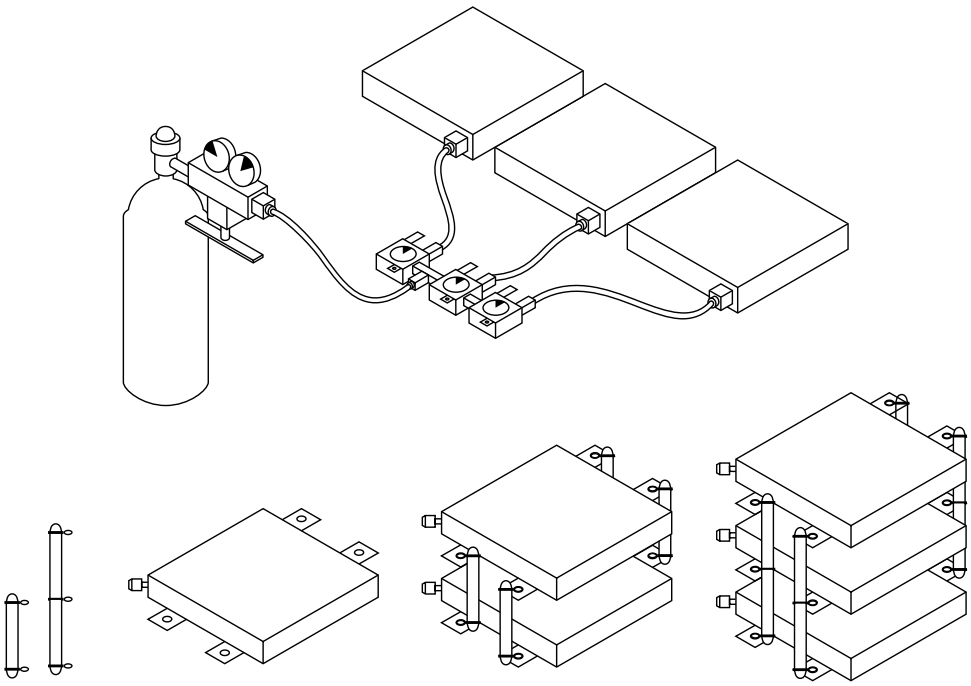


Fig. 5.29: Combining SAVA flat lifting bags to increase the lifting height

5.4.3. LIFTING LOADS OF IRREGULAR SHAPES

5.4.3.1. Lifting pipes and profiles

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

Insert a rubber-coated metal plate or fibreboard between the SAVA lifting bag and the load to allow the lifting force to evenly distribute over the entire lifting surface of the SAVA lifting bag, see Fig. 5.30.

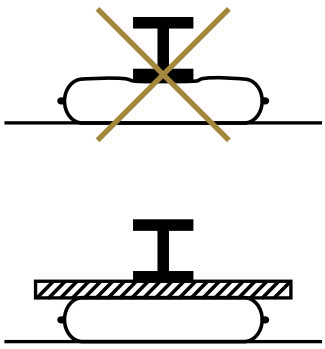


Fig. 5.30: Supporting the SAVA lifting bag with a fibreboard when lifting profiles or pipes

5.4.3.2. Lifting of cylindrical objects

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

For this reason, at least two SAVA lifting bags are used for lifting cylindrical objects, placed one at each side of the object, see Fig. 5.31. Make sure that SAVA lifting bags are inflated evenly and simultaneously.

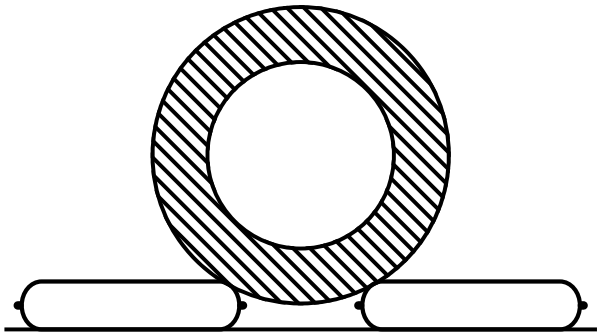


Fig. 5.31: Lifting large cylindrical loads

5.4.3.3. Separating and pushing with the SAVA lifting bag

SAVA lifting bags can further be used for separating and pushing objects; however, a problem can arise with thin-walled objects, as bag's pressure could bend or tore them. For this reason, lean the SAVA lifting 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 SAVA lifting bag and the object to allow distribution of the pushing force over a larger surface, see Fig. 5.32.

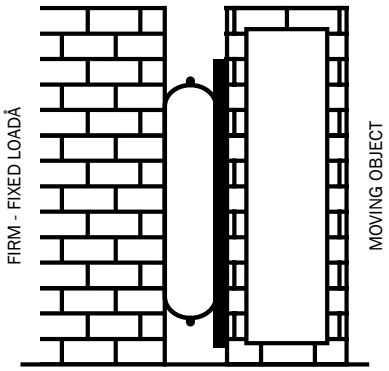


Fig. 5.32: Moving or separating objects

5.5. UNEXPECTED SITUATIONS

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

If lifting of loads with SAVA 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 SAVA lifting bag collapses.

Table 5: Unexpected situations

UNEXPECTED SITUATION	CONSEQUENCE	PROCEDURE
Abrupt pressure drop in the SAVA lifting bag. The SAVA lifting bag and the load sink in an uncontrolled manner.	The load sinks down to the support. A very loud bang is heard when SAVA lifting bag collapses.	If a failure is identified on one of the components, replace that component; otherwise replace all components.
Even though the pressure gauge shows the specified working pressure is reached, the SAVA lifting bag does not lift.	The load cannot be lifted.	Double-check whether a suitable SAVA lifting bag was chosen.
In spite of the activated valve for inflation of SAVA lifting bag, the working pressure on the pressure gauge is not reached.	The load cannot be lifted.	Check SAVA lifting bag's inflation system. Examine individual components and if a failure is identified on one of the components, replace the component; otherwise replace all system components.
Uncontrolled slipping of the load or the SAVA lifting bag.	The load is unbalanced.	Very carefully lower the load to the basic position or to the support; previously check and, if required, arrange the place. or support. Then double-check whether SAVA lifting bags are set-up correctly.
Uncontrolled exceeding of working pressure	SAVA lifting bag collapses, which is accompanied by a loud bang.	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. Check the inflation system of SAVA lifting bags. Examine individual components and if a failure is identified on one of the components, replace the respective component, or replace all system components.

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

CODE	NAME
528746	Compressed-air cylinder, 300 bar (4350 psi), 6 l (366 cu.in.)
523002	Compressed-air cylinder, 200 bar (2900 psi), 1 l (122 cu.in.)
519811	Carry-on valise for compressed air cylinder, 6 l (366 cu.in.)
523835	Pressure reducer, 8 bar (116 psi), 200/300 bar (2900/4350 psi) – DIN
595820	Pressure reducer, 8 bar (116 psi), 200/300 bar (2900/4350 psi) – CGA
557311	Pressure reducer, 10 bar (145 psi), 300 bar (4351 psi) – DIN
596586	Pressure reducer, 10 bar (145 psi), 300 bar (4351 psi) – CGA
523000	Pressure reducer, 200 bar (2900 psi) – 8 bar (116 psi) (preset)
517967	Inflation hose, 5 m (16'), yellow – 8 bar (116 psi)
516191	Inflation hose, 5 m (16'), red – 8 bar (116 psi)
516192	Inflation hose, 5 m (16'), blue – 8 bar (116 psi)
529317	Inflation hose, 5 m (16'), grey – 8 bar (116 psi)
517968	Inflation hose, 10 m (33'), yellow – 8 bar (116 psi)
516193	Inflation hose, 10 m (33'), red – 8 bar (116 psi)
516194	Inflation hose, 10 m (33'), blue – 8 bar (116 psi)
529318	Inflation hose, 10 m (33'), grey – 8 bar (116 psi)
544111	Hose with shut-off + safety valve, 8 bar (116 psi), 10 m (33')
519807	Truck tyre inflator adapter
525278	Hose with shut-off valve, 0.5 m (2'), – 8 bar (116 psi)
522999	Inflation distributor, 2 x 1 m (3') – 8 bar (116 psi)
76681	Single fitting controller, 8 bar (116 psi)
76682	Double fitting controller, 8 bar (116 psi)
519819	Hand-held single deadman controller, 8 bar (116 psi)
519820	Hand-held double deadman controller, 8 bar (116 psi)
528126	Double deadman controller, 8 bar (116 psi) – plastic box
576803	Double deadman controller, 8 bar (116 psi) – led lights, plastic box
528132	Double deadman controller, 8 bar (116 psi) – metal box
544124	Triple deadman controller, 8 bar (116 psi) – metal box
579558	Double controller, 8 bar (116 psi) – case box
538320	Foot pump – 8 bar (116 psi)
519051	Shut-off + safety valve - 8 bar (116 psi)
519808	Compressed air mains
519805	Truck tyre valve
519806	Truck tyre valve connection
529383	Dual connector for compressed air cylinders, 200/300 bar (2900/4350 psi)
529384	Triple connector for compressed air cylinders, 200/300 bar (2900/4350 psi)
519809	Universal connector kit
519810	Bag for connector kit
529005	Truck compressed air connection
529006	Truck compressed air connection – blind coupling
529704	Adapter for construction site compressor
557311	Pressure reducer, 10 bar (145 psi), 300 bar (4350 psi) – DIN
596586	Pressure reducer, 10 bar (145 psi), 300 bar (4350 psi) – CGA
291260	Inflation hose, 5 m (16'), yellow – 10 bar (145 psi)
291261	Inflation hose, 5 m (16'), red – 10 bar (145 psi)
291262	Inflation hose, 5 m (16'), blue – 10 bar (145 psi)
291263	Inflation hose, 5 m (16'), grey – 10 bar (145 psi)
291264	Inflation hose, 10 m (33'), yellow – 10 bar (145 psi)
291265	Inflation hose, 10 m (33'), red – 10 bar (145 psi)
291266	Inflation hose, 10 m (33'), blue – 10 bar (145 psi)
291267	Inflation hose, 10 m (33'), grey – 10 bar (145 psi)
291290	Hose with shut-off + safety valve, 10 bar (145 psi), 10 m (33')

CODE	NAME
589333	Hose with shut-off valve, 10 bar (145 psi), 0.5 m (2')
589334	Inflation distributor, 2x 1 m (3') – 10 bar (145 psi)
291258	Single fitting controller, 10 bar (145 psi)
291259	Double fitting controller, 10 bar (145 psi)
291256	Hand-held single deadman controller, 10 bar (145 psi)
291257	Hand-held double deadman controller, 10 bar (145 psi)
291255	Double deadman controller, 10 bar (145 psi) – plastic box
291286	Double deadman conntroller, 10 bar (145 psi) – led lights, plastic box
291254	Double deadman controller, 10 bar (145 psi) - metal box
291298	Triple deadman controller, 10 bar (145 psi) – metal box
579559	Double deadman controller, 10 bar (145 psi) – case box
576565	Foot pump – 10 bar (145 psi)
291282	Shut-off + safety valve, 10 bar (145 psi)
530545	Set of triple flat bag connectors, orange (4 pcs per set)
529480	Set of dual flat bag connectors, yellow (4 pcs per set)
291282	Shut-off + safety valve – 10 bar (145 psi)
542868	Safety carrier rack-two cylinder, 6 l (366 cu.in.), modul-trolley system
542872	Safety carrier rack-two cylinder, 6 l (366 cu.in.), modul-trolley system
556308	Load plate (metal-rubber) #350
556309	Load plate (metal-rubber) #420
556310	Load plate (metal-rubber) #520
556311	Load plate (metal-rubber) #670

5.7. DISPOSAL OF WASTE MATERIAL

Damaged or destroyed products or products whose service life has expired should be withdrawn from use. Since SAVA lifting bags are not an ordinary waste but a reusable one, waste classification according to the valid local regulations applies.

The product is partly recyclable.

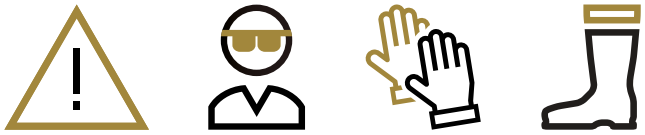
5.8. BRIEF INSTRUCTIONS

See the last page of the Instructions for use for brief instructions on using SAVA lifting bags.

6.0. MAINTENANCE AND CLEANING

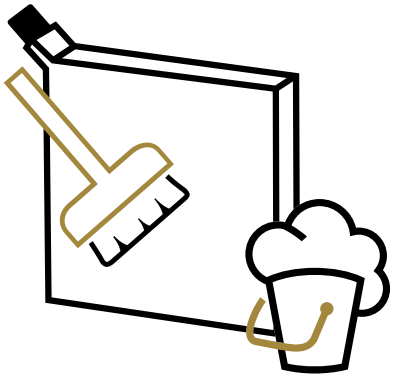
6.1. SAFETY PRECAUTIONS

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



6.2. MAINTENANCE AND CLEANING AFTER USE

6.2.1. MAINTENANCE OF SAVA LIFTING BAGS AFTER USE

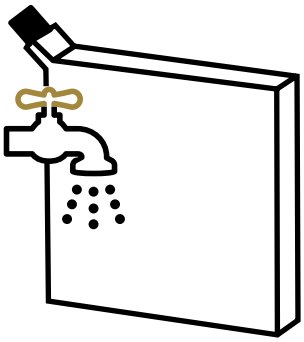


Clean and check SAVA lifting bags after every use. Oily and greasy stains can cause SAVA lifting bags to slide, while dirt in the inflation connector prevents connection with a hose and obstructs air or water flow.

Position SAVA lifting bags 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 SAVA lifting bags.

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



When the agglutinated dirt is removed, soak the stains on SAVA lifting bag's surface with a mild solution of dish washing detergent and warm water, and remove the rest of the dirt from the surface of SAVA lifting bag. Never use petrol, diluters, alcohol or aggressive cleaning agents.

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

High-pressure cleaners should NOT be used.

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

Do not dry SAVA lifting bags in a drier or by means of heating devices.

Carefully examine the cleaned and dried SAVA 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 SAVA lifting bag.
- Check the connector. If damages prevent connection of the connection coupling with a connecting hose, replace the connector.

6.2.1.1. Replacing the connector on SAVA 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 SAVA 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 on SAVA 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 on SAVA lifting bag and manually tighten it, see Fig. 6.3

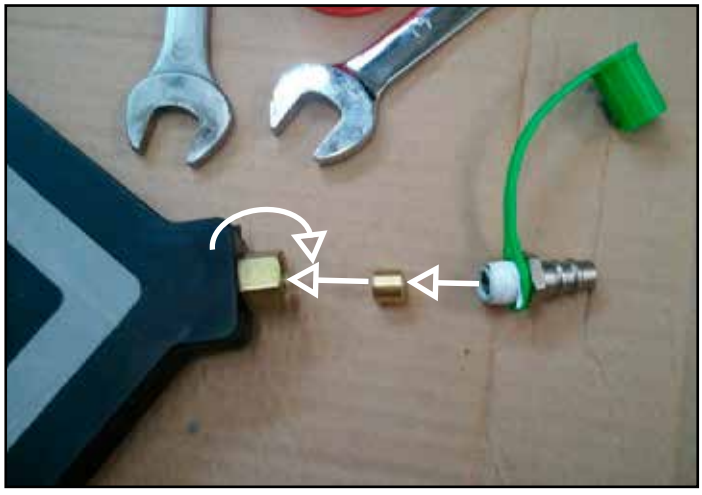


Fig. 6.3: Attaching a new connector

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

When replacing the plug on SAVA lifting bag, make sure that the SLK and SFB-K bags are equipped with 8 bar (116 psi) plugs, while the SLK-H and SFB-H bags are equipped with 10 bar system connectors (145 psi). Non-compliance with the instructions may lead to applying improper pressure to the lifting bag.

6.2.2. MAINTENANCE OF SUPPLY AND CONNECTING HOSES AFTER USE

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

High-pressure cleaners should NOT be used.

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 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 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 hoses.
- Check the connector. If damages prevent connection with the connecting coupling on the hose, replace the hose.
- Check the coupling. If damages prevent connection to the connector on SAVA lifting bag, replace the hose.

6.2.3. MAINTENANCE OF CONTROLLERS 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 SAVA 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. Fire-fighters 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 any doubt arises as to the safe test performance, immediately interrupt the test and consult the manufacturer or its authorised representative about further steps.

Function tests, which are performed under pressure, are allowed only if no faults have been identified in a prior visual inspection.

If the last scheduled periodic test of SAVA lifting bag has not been performed or any doubt arises as to safety or reliability of the product, it is prohibited to perform the function test as specified in Chapter 6.3.1.2, as it may be dangerous. Carry out periodic testing prior to the function test.

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

6.3.1. CHECK-UP INTERVALS

SAVA lifting bag

TEST	CHECK-UP INTERVAL	PERFORMED BY	PROCEDURE
Visual test	• After every use • Annually	A person qualified for operating SAVA lifting bags	Chapter 6.3.1.1.
Function test	• After every use • Annually	A person qualified for operating SAVA lifting bags	Chapter 6.3.1.2.
Periodic test	5th, 10th and 13th year after manufacture, or if doubt arises as to safety and/or reliability of the product	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 SAVA lifting bags	Chapter 6.3.1.3.
Function test	• After every use • Annually	A person qualified for operating SAVA lifting bags	Chapter 6.3.1.4.
Periodic test	5th, 10th and 13th year after manufacture, or if doubt arises as to safety and/or reliability of the product	Manufacturer or a person authorised by the manufacturer	

Connecting hose

TEST	CHECK-UP INTERVAL	PERFORMED BY	PROCEDURE
Visual test	• After every use • Annually	A person qualified for operating SAVA lifting bags	Chapter 6.3.1.5.
Function test	• After every use • Annually	A person qualified for operating SAVA lifting bags	Chapter 6.3.1.6.
Periodic test	5th, 10th and 13th year after manufacture, or if doubt arises as to safety and/or reliability of the product	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 SAVA lifting bags	Chapter 6.3.1.7.
Function test	• After every use • Annually	A person qualified for operating SAVA lifting bags	Chapter 6.3.1.8.
Periodic test	5th, 10th and 13th year after manufacture, or if doubt arises as to safety and/or reliability of the product	Manufacturer or a person authorised by the manufacturer	

6.3.1.1. Visual inspection of SAVA lifting bags

The following test may be carried out outdoors only.

If the lifting bag has not passed the function test, it should be withdrawn from further use. If any doubt arises as to the severity of the damage to the lifting bag, have it inspected by the manufacturer!

The controller for test performance must be tested periodically as specified.

In visual inspection, lifting bags are checked for damages; the inspection includes the following steps:

1. Visually check:
   a. condition of the connector,
   b. readability of the label,
   c. condition of the handles,
   d. condition of plug's protective cap.
2. Connect the unloaded lifting bag as described in Chapter 5.3. Check whether the connector engages/disengages correctly.
3. Fill the lifting bag up to 0.2-times working pressure.
4. Visually check the bag for any:
   a. unusual bulges,
   b. punctures,
   c. cuts,
   d. torn sections, or
   e. other mechanical damages.
5. Using a brush, apply some soapy water over the entire SAVA lifting bag's surface including the connection. Visually check sealing of SAVA lifting bag and connection.
6. Deflate and disconnect the lifting bag as specified in Chapter 5.3

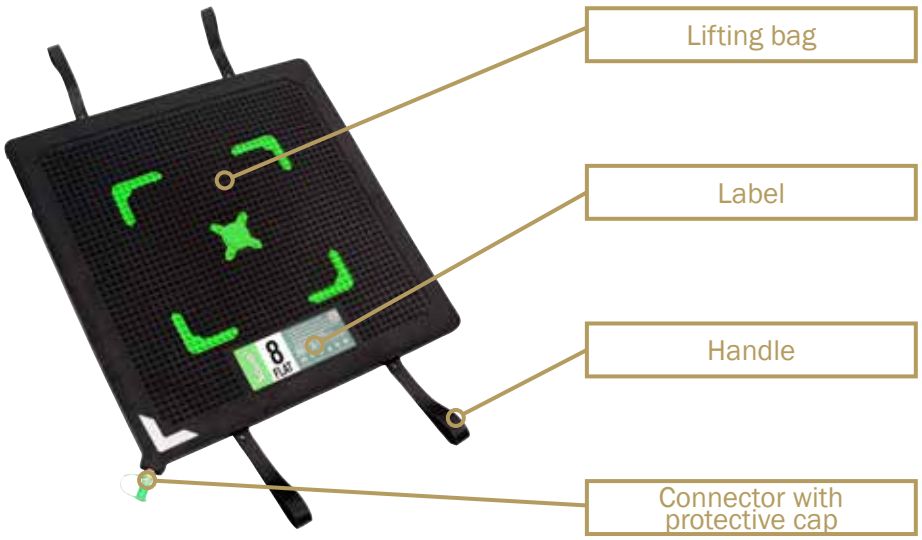


Fig 6.4: SAVA lifting bag

For the sake of consistent inspection of the lifting bag, complete the test report in attachment 1 as you proceed with the inspection.

6.3.1.2. Function test of SAVA lifting bag

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

If a lifting bag has not passed the function test, it should be withdrawn from further use. If any doubt arises as to the severity of the damage to the lifting bag, have it inspected by the manufacturer.

Lifting bags have to pass the visual inspection in order to qualify for the function test.

If in doubt whether lifting bags are safe to work with or be tested, consult the manufacturer on the manner of testing before performing any tests.

During the function test the high-pressure lifting bag may collapse, which is why safety precautions should be followed.

If the last scheduled periodic test of SAVA lifting bag has not been performed or any doubt arises regarding safety or reliability of the product, it is prohibited to perform the function test as this may be dangerous. Carry out periodic testing prior to performing the function test.

The controller for test performance must be tested periodically as specified.

In the function test, lifting bags are checked for their correct functioning as follows:

1. Connects SAVA lifting bag as described in Chapter 5.3.
2. Inflate SAVA lifting bag up to 0.5-times working pressure.
3. SAVA lifting bag is functional if the pressure inside the bag does not drop by more than 10 % within 15 minutes.
4. Reduce the pressure in the bag to 0.2-times working pressure and check the bag for:
   a. leaks,
   b. deformations,
   c. damages,
   d. visual carrying cord,
   e. deep cuts,
   f. separations,
   g. other damages.

For the sake of consistent function test of lifting bag, complete the test report in attachment 1 as you proceed with the test.

6.3.1.3. Visual inspection of pressure reducing valve

In the visual inspection, the pressure reducing valve is checked for damages and its correct functioning as follows:

1. Washer (O-ring) is inserted in inflation connection of the cylinder, it is not damaged.
2. Threaded inflation connection on the cylinder is not damaged.
3. None of the pressure gauges is damaged, maximum pressure indications are in place.
4. Pressure gauges are protected with protective caps, which are not damaged
5. Control lever for pressure regulator moves smoothly.
6. Stop valve is not damaged and functions smoothly.
7. Supply hose is not torn, punctured or damaged, no stiff areas, as a consequence of acids, etc.
8. Hose connector is not damaged.

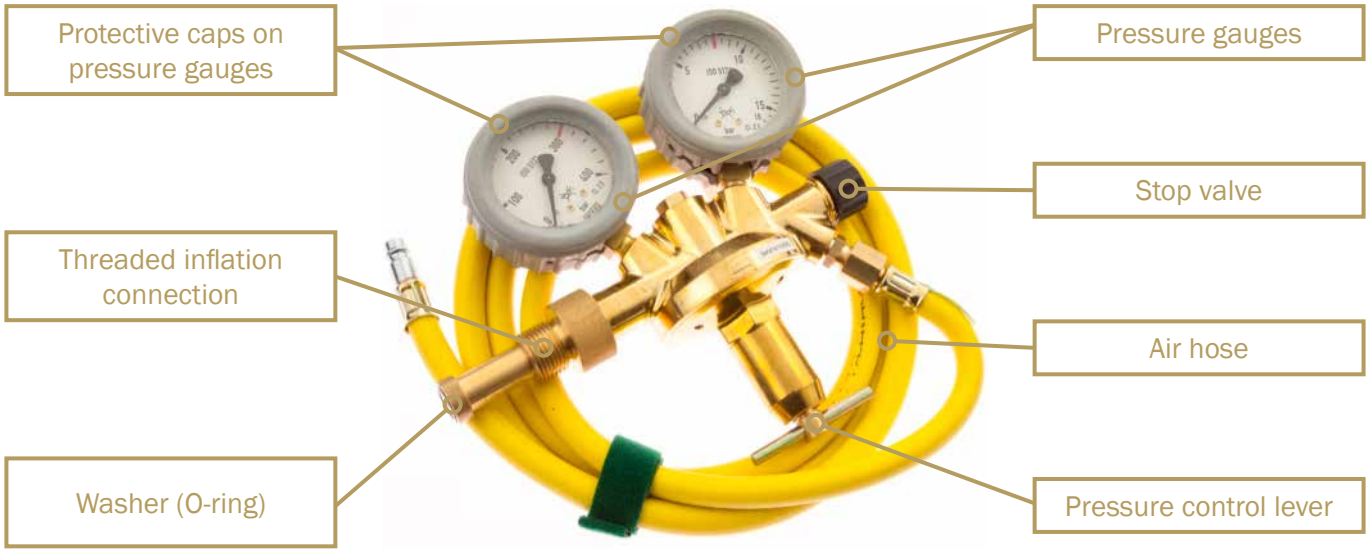


Fig. 6.5: Pressure reducing vakve

For the sake of consistent visual inspection of pressure reducing valve, complete the test report in attachment 2 as you proceed with the inspection.

6.3.1.4. Function tests of pressure reducing valve

In the function test, the pressure reducing valve is checked for its correct functioning; the test includes the following steps:

1. Connect the pressure reducing valve to the fully filled pressure vessel.
2. Close the stop valve on the pressure reducing valve.
3. Open the pressure vessel.
4. Check whether the left pressure gauge indicates pressure in the pressure vessel.
5. Check whether the right pressure gauge indicated the reduced pressure.
6. Slightly open the stop valve to release some air, turn the pressure control lever and monitor the right pressure gauge to see whether the pressure can be regulated in the entire area.
7. Close the stop valve and set the reduced pressure to the maximum working pressure.
8. Apply some soapy water to check if the stop valve is leak-tight.
9. Set the reduced pressure to 12 bar (174 psi) and make sure that the safety valve has not yet been activated.
10. Set the reduced pressure to 6 bar (87 psi).
11. Connect the hose of the pressure reducing valve to the inlet coupling of the controller. Check if the plug on the hose of pressure reducing valve engages and disengages correctly from the controller's coupling.
12. Open the stop valve on the pressure reducing valve.
13. Apply soapy water to check tightness of connection between the hose of pressure reducing valve with the pressure reducing valve, the hose of pressure reducing valve and the plug of pressure reducing valve.
14. Empty the system and disconnect the individual parts of the system as described in Chapter 5.3.3.

For the sake of consistent visual inspection of the pressure reducing valve, complete the test report in attachment 2 as you proceed with the inspection.

6.3.1.5. Visual inspection of inflation hose

In the visual inspection, the inflation hose is checked for damages and its correct functioning as follows:

1. Coupling has no visual defect and is not damaged.
2. Connector has no visual defect and is not damaged.
3. Coupling and connector connect firmly.
4. Hose is free from torn sections, punctures and any other damages such as stiff sections as a consequence of exposure to acid etc.

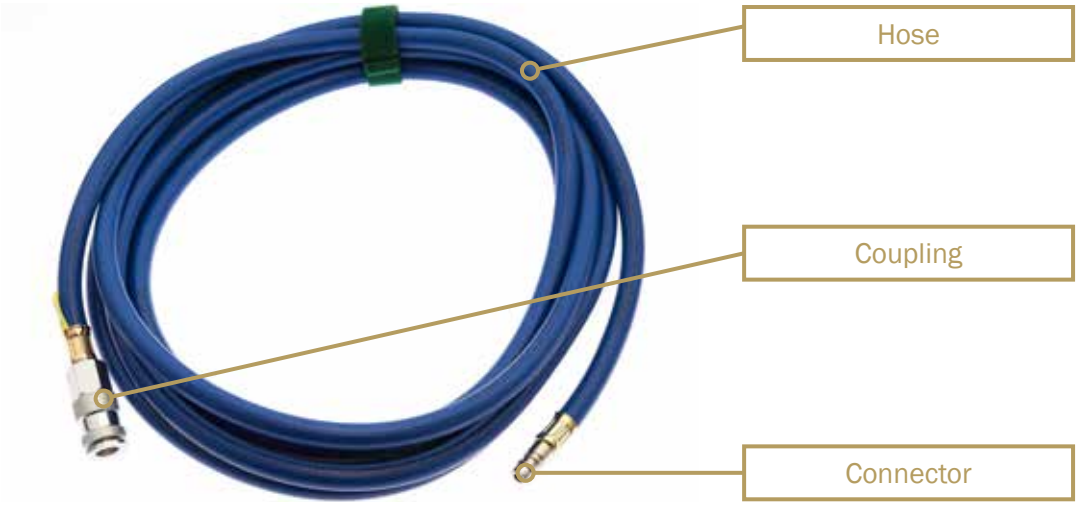


Fig. 6.6: Inflation hose

For the sake of consistent performance of visual inspection of inflation hose, complete the test report in attachment 3 as you proceed with the inspection.

6.3.1.6. Function test of inflation hose

In the function test, the inflation hose is checked for its correct functioning as follows:
1. Connect the pressure reducing valve to the pressure vessel and the controller to the pressure reducing valve, as described in Chapter 5.3.1. Set the reduced pressure to 6 bar (87 psi).
2. Connect the hose's connector to the outlet coupling of the controller and check also if the connector and the coupling engage/disengage correctly.
3. Connect the lifting bag to the coupling of the inflation hose and check also if the connector on the lifting bag and the coupling of the hose engage/disengage correctly.
4. Disconnect the coupling of the inflation hose from the lifting bag.
5. Set the control lever to the inflation position and/or press the button for inflation and/or set the pipe into fully open position and wait for the pressure on the controller discontinues to increase. Then release the control lever/button or close the pipe.
6. Apply soap water and check the connector, couplings and hoses for tightness.
7. Empty the system and disconnect individual parts of the system, as described in Chapter 5.3.3.

For the sake of consistent function test of inflation hose, complete the test report in attachment 3 as you proceed with the inspection.

6.3.1.7. Visual inspection of the controller

FITTING CONTROLLER
In the visual inspection, the fitting controller is checked for damages and its correct functioning as follows:
1. Inlet coupling is not damaged, it functions properly.
2. Outlet couplings are not damaged, they function properly.
3. Stop valves are not damaged, they function smoothly.
4. Pressure gauges are protected with protective caps, which are not damaged.
5. Pressure gauges are not damaged; maximum working pressure indications are in place.
6. Safety valves are not damaged and have no visible faults.
7. Protective screw on safety valves can be tightened/untightened smoothly.

Fig. 6.7: Fitting controller

For the sake of consistent visual inspection of fitting controller, complete the test report in attachment 4 as you proceed with the inspection.

HAND-HELD CONTROLLER

In the visual inspection, the hand-held controller is checked for damages and its correct functioning as follows:

1. Inlet coupling is not damaged, it functions properly.
2. Outlet couplings are not damaged, they function properly.
3. Inflation buttons are not damaged; they function smoothly.
4. Deflation buttons are not damaged; they function smoothly.
5. Pressure gauges are not damaged, maximum working pressure indications are in place.
6. Safety valves have no visible faults.

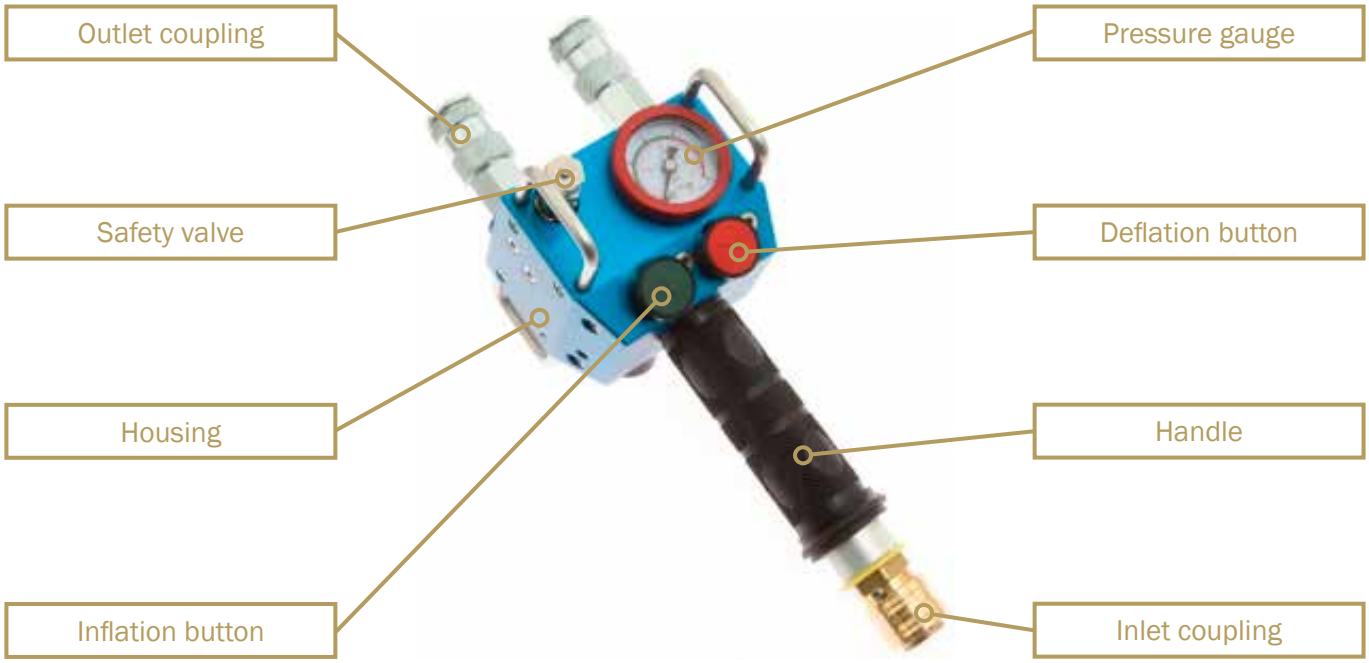


Fig.6.8: Hand-held controller

For the sake of consistent visual inspection of hand-held controller, complete the test report in attachment 5 as you proceed with the inspection.

DEADMAN CONTROLLER - METALLIC

In the visual inspection, the metallic deadman controller is checked for damages and its correct functioning as follows:

1. Inlet coupling is not damaged, it functions properly.
2. Outlet couplings are not damaged, they function properly.
3. Control levers are not damaged, they function smoothly.
4. Pressure gauges are protected with protective caps, which are not damaged.
5. Pressure gauges are not damaged; maximum working pressure indications are in place.
6. Safety valves have no visible faults.
7. Housing is not damaged.

Fig.6.9: Deadman controller - metallic

For the sake of consistent visual inspection of metallic deadman controller, complete the test report in attachment 6 as you proceed with the inspection.

DEADMAN CONTROLLER - PLASTIC

In the visual inspection, the plastic deadman controller is checked for damages and its correct functioning as follows:

1. Inlet coupling is not damaged, it functions properly.
2. Outlet couplings are not damaged, they function properly.
3. Control levers are not damaged, they function smoothly.
4. Pressure gauges are not damaged; maximum working pressure indications are in place.
5. Housing is not damaged.

Fig.6.10: Deadman controller – plastic

For the sake of consistent visual inspection of plastic deadman controller, complete the test report in attachment 7 as you proceed with the inspection.

DEADMAN CONTROLLER IN A CARRYING CASE

In the visual inspection, the plastic deadman controller is checked for damages and a correct functioning as follows:

1. Inlet coupling is not damaged, it functions properly.
2. Outlet couplings are not damaged, they function properly.
3. Control levers are not damaged, they function smoothly.
4. Pressure gauges are protected with protective caps, which are not damaged.
5. Pressure gauges are not damaged; maximum working pressure indications are in place.
6. Safety valves have no visible faults.
7. The case is not damaged.

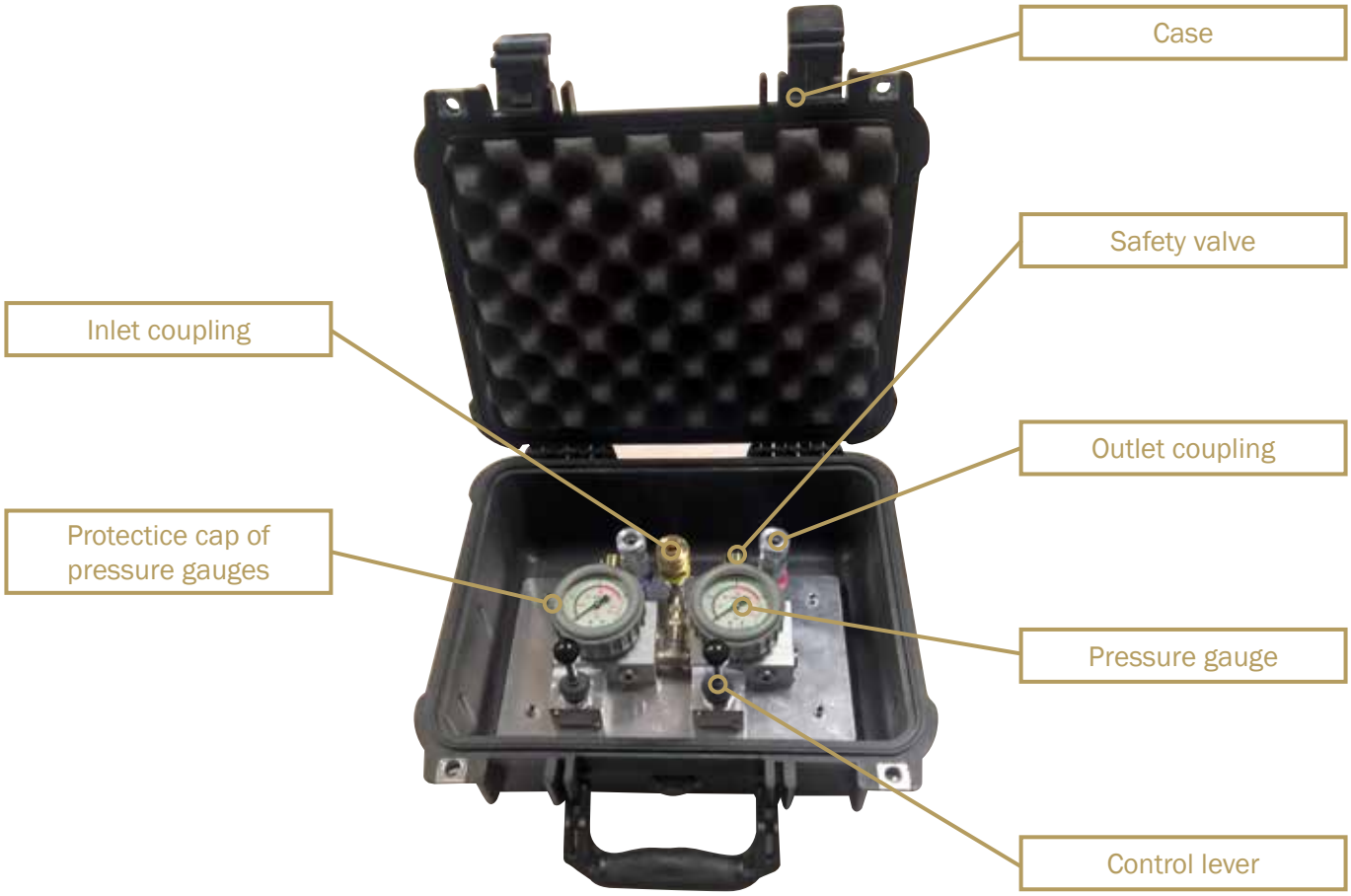


Fig.6.11: Deadman controller in the case

For the sake of a consistent visual inspection of deadman controller in the case, complete the test report in attachment 8 as you proceed with the inspection.

6.3.1.8. Function test of controller

In the function test, the controller is checked for its correct functioning as follows:

1. Connect the pressure reducing valve and pressure vessel to the inlet coupling of the controller, as described in Chapter 5.3.1. At the same time check, whether the connector on the hose of pressure reducing valve engages and disengages correctly from the inlet coupling of the controller.
2. Connect the inflation hose to the outlet coupling of the controller and the lifting bag on the inflation hose, as described in Chapter 5.3.1. At the same time check, whether the connector on the inflation hose engages and disengages correctly from the outlet coupling of the controller. The connected inflation hose has to pass the function test prior to that.
3. Open pressure vessel, set the reduced pressure to 3 bar (44 psi) and open the stop valve on the pressure reducing valve, as described in Chapter 5.3.1.
4. Push the control lever to inflation position and/or press the inflation button and/or open the pipe. Then release the control lever/button and/or close the pipe. When the control lever is set to inflation position and/or the inflation button is pressed and/or the pipe is open, the lofting bag should begin to inflate.

WARNING: The pressure in SAVA lifting bag may not exceed the value of 0.2-times working pressure.

5. Push the control lever to position for emptying and/or push the button for deflation and/or open the protective screw on the safety valve to completely deflate the lifting bag.
6. Disconnect the lifting bag.
7. Set the reduced pressure to 6 bar (87 psi) and push the control lever to inflation position and/or press the button for inflation and/or open the pipe and wait until the pressure on the pressure gauge discontinues to increase.
8. Set the reduced pressure from 11 to 12 bar (from 160 to 174 psi).
9. Read the pressure on the pressure gauge of the tested controller branch and wait for 5 minutes. During this time the pressure value on the pressure gauge of the tested controller branch may not drop or increase by more than 10 %.
   a. If the pressure variance is within the tolerances, the tested controller branch has passed the test.
   b. If the pressure increases, the controller valve is defective. The controller is not suitable for further use.
   c. If the pressure drops, apply some soapy water to check whether the joint between the outlet coupling and the connector on the hose leaks.
10. Push the control lever to inflation position and/or press the button for inflation and/or fully open the pipe, and check the functioning of safety valve. The safety valve should open within the area between the maximum working pressure and 1.1-times maximum working pressure.
11. Push the control lever to deflation position and/or push the button for deflation and/or fully open the pipe, open the protective screw on the safety valve and empty the inflation hose.
12. Close the stop valve on pressure reducing valve, push the control lever to inflation position and then to deflation position and/or push the button for inflation and then deflation and/or open the protective screw on the safety valve so that pressure in the system drops. Disconnect the inflation hose from the controller. In case of fitting controllers, close the stop valve on the safety valve and set the pipe to fully open position.
13. Repeat the steps from 2 to 12 for all branches of the controller.
14. Apply some soapy water on the joint between the hose connector of pressure reducing valve and the inlet coupling to check for tightness.

For the sake of a consistent function test of accessories, complete test reports in attachments 4-8 as you proceed with the inspection.

6.4. SERVICE LIFE

The age of SAVA lifting bags can be determined from a serial number: the first two digits stand for the month of manufacture, and the second two digits for the year of manufacture.

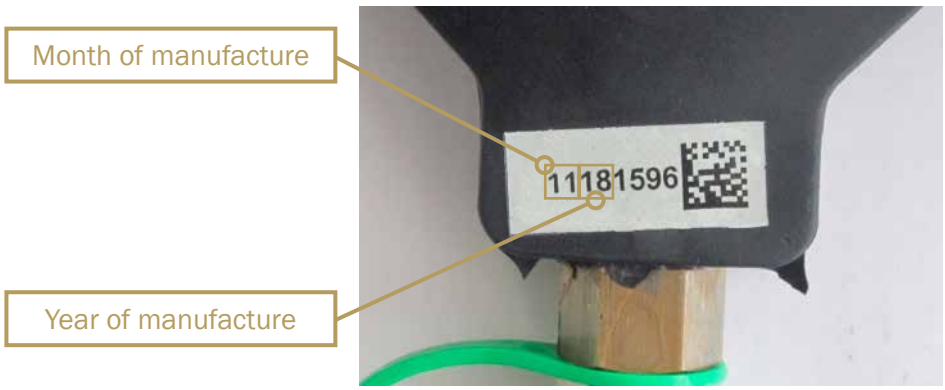


Fig. 6.12: Serial number on SAVA lifting bag

The example in Fig.6.12 shows SAVA lifting bag was made in November (11) in 2018 (18).

SAVA lifting bags are made of rubber and thus exposed to the natural ageing process. Although a visual inspection shows SAVA lifting bag is still in good condition, it should be put out of operation after 15 years, because signs of ageing could be hidden in the material.

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 pressure vessel. • Open the valve on pressure vessel.
Required pressure cannot be set on the outlet pressure gauge of pressure reducing valve.	• Adjusting valve blocked pressure in pressure vessel. • 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 supply hose of pressure reducing valve cannot be correctly inserted in the controller's connecting coupling.	• Dirt on the connector or coupling. • Connector or coupling is damaged.	• Clean the plug and coupling. • Replace the pressure reducing valve or controller.
The connecting 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 SAVA lifting bag does not inflate.	• Safety valve failure. • Protective screw on the safety valve is unscrewed.* • Connector or coupling blocked. • The supply hose or connecting hoses are incorrectly connected. • The supply hose or connecting 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 supply hose or connecting hoses. • Replace the pressure reducing valve or the supply hose or connecting hoses.

FAULT	REASON	REMEDY
In spite of the activated control lever for lowering of SAVA lifting bag, the bag does not lower.	• Connectors or couplings are blocked.	**Warning!** **Exercise the utmost caution when carrying out the following procedure.** 1. Double-check whether the load is correctly supported to assure stability when deflating SAVA lifting bags. 2. Shut-off the valve on pressure vessel. 3. Deflate all SAVA lifting bags connected to the controller. 4. Disconnect the connecting hose on the SAVA lifting bag, which was not deflated, be very careful. 5. If the SAVA lifting bag still does not deflate, clean the connector of the SAVA lifting bag with a metal needle; be careful and allow a safety distance.
The last scheduled periodic testing of SAVA lifting bag or the accessories was not performed.	• Non-observance of instructions for use.	**Warning!** **Using the equipment that has not been tested is prohibited.** Perform periodic testing prior to further use of equipment.

** It applies to the controllers with a ball valve and the controller with of the foot pump.*

7. WARRANTY CONDITIONS

7.1. GENERAL CONDITIONS

7.1.1. These warranty conditions apply as for Environmental protection and rescue products, manufactured by Trelleborg Slovenija, d.o.o. (hereinafter refert to as TBSLO), Product Area Environmental protection and rescue products (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 TBSLO Product Area Environmental protection and rescue products 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, available at:
www.SAVA.eu/environmental-protection-and-rescue/manuals

7.3. WARRANTY

7.3.1. TBSLO 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 as of delivery.

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 of 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 TBSLO or its authorized agents.

7.4.2. Warranty shall also be excluded and TBSLO 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. TBSLO 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 are not covered by this warranty.

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 TBSLO 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, TBSLO 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 TBSLO, Product Area Environmental protection and rescue products, Škofjeloška c. 6, 4000 Kranj, Slovenia..

7.6. REMEDIES

7.6.1. TBSLO shall decide on a claim within forty -five days after receiving a complete documentation and Product pursuant to art 5.

7.6.2. Providing TBSLO acknowledges the claim as justified, it shall, at its discretion, either:
- repair the Product,
- replace those components of the Product which are defective,
- replace the Product, if repair is not possible or reasonable,
- reimburse the consideration for the Product or its components which are defective.

7.6.3. Whenever TBSLO repairs or replaces the Product at its expense or reimburses the purchase price, it shall reimburse the purchaser, with a credit note, the same surface freight amount the purchaser had when returning the Product to TBSLO.

7.6.4. Remedies pursuant to this article 6 shall constitute the sole and exclusive remedy in the event of a breach of warranty. For the avoidance of doubt, TBSLO shall not be liable for any incidental, consequential and/or non-pecuniary damages or damages having a comparable effect. TBSLO's aggregate liability in respect of any and all losses arising under or in connection to the contract/ purchase order/any similar document that is the basis for sale of Products, shall be limited to an amount equal to the invoiced price for the Products supplied. Any exclusions or limitations of liability are agreed to be extended for the benefit of all entities within TBSLO's group.

7.7. CLOSING PROVISIONS

7.7.1. No statement or action by Trelleborg Slovenija, whether express or implied, other than set forth herein, shall constitute a warranty.

7.7.2. Any applicability of general terms and conditions used by the purchaser, wherever stated, is hereby explicitly excluded, notwithstanding any provisions of such general terms and conditions to the contrary.

7.7.3. This warranty statement is subject to the laws of the Republic of Slovenia, with the exclusion of its conflict of law principles.

Kranj, January 2019

Trelleborg Slovenija, d.o.o.

PA Environmental protection products (PA EKO)

We are a division of Trelleborg Slovenija d.o.o..
We manufacture and sell rubber products for environmental protection and rescue operations and industrial use. Our growing division was established more than thirty years ago and is constantly striving to meet our customer's current and future needs and expectations.

WWW.SAVATECH.EU
WWW.SAVATECH.COM

Instructions for Use: High-Pressure Lifting Bags

Environmental protection products
phone: +386 (0)4 206 6388
e-mail: info.eko@savatech.si
fax: +386 (0)4 206 6390

Škofjeloška cesta 6, 4000 Kranj, Slovenia

11/2019

TRELLEBORG

Attachments to
Instructions for use

Sawa

ATTACHMENTS INDEX

ATTACHMENT 1: Visual and function test report: HIGH-PRESSURE LIFTING BAGS

SERIAL NUMBER	DATE OF MANUFACTURE
Inspected by:	Date:

Please mark damages in the picture.

VISUAL INSPECTION

The controller for test performance must be tested periodically as specified.

1	Connector is not damaged.	YES	NO
2	Label is readable.	YES	NO
3	Carrying handles are not damaged.	YES	NO
4	Connector is protected with a protective cap, which is not damaged.	YES	NO

Connect the bag to the accessories and inflate it up to 0.2 times working pressure.

5	Bag does not have any unusual bulges.	YES	NO
6	Bag is not punctured.	YES	NO
7	Bag is not cut.	YES	NO
8	Bag is not torn.	YES	NO
9	Bag has no other mechanical damages.	YES	NO
10	Bag's surface is leak-tight.	YES	NO
11	Bag's connector is leak-tight.	YES	NO

THE PRODUCT HAS PASSED THE VISUAL INSPECTION:	YES	NO
Inspected by: Signature:	Date:	

FUNCTION TEST

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

If the last scheduled periodic test of SAVA lifting bag has not been performed or any doubt arises regarding safety or reliability of the product, it is prohibited to perform the function test as this may be dangerous. Carry out periodic testing prior to the function test.

The controller for test performance must be tested periodically as specified.

Slowly inflate the bag with air up to 0.5-times working pressure.

12	Pressure drop is within permissible values. (Enter pressure value on the controller at the beginning of the test and after 15 min) (Permissible pressure drop is 10% of the pressure at the beginning of the test)	**Pressure at the beginning**	**Pressure after 15 min**
		YES	NO

Reduce the pressure in the bag to 0.2 times working pressure and check the bag as follows.

13	Bag is leak-tight.	YES	NO
14	Bag has no unusual distortions.	YES	NO
15	Bag has no damaged spots.	YES	NO
16	Bag has no visible carrying cord structure.	YES	NO
17	Bag has no deep cuts.	YES	NO
18	Bag has no separations.	YES	NO
19	Bag has no other damages.	YES	NO

THE PRODUCT HAS PASSED THE FUNCTION TEST:	YES	NO
Tested by: Signature:	Date:	

ATTACHMENT 2: Visual and function test report: PRESSURE REDUCING VALVE

Please mark damages in the picture.

VISUAL INSPECTION

1	Washer is inserted in inflation connection, it is not damaged.	YES	NO
2	Inflation connection thread is not damaged.	YES	NO
3	Pressure gauges are not damaged; maximum working pressure indications are in place.	YES	NO
4	Pressure gauges are protected with protective caps, which are not damaged.	YES	NO
5	Pressure control lever is not damaged, it functions smoothly.	YES	NO
6	Stop valve is not damaged, it functions smoothly.	YES	NO
7	Air hose is not damaged.	YES	NO
8	Hose connector is not damaged.	YES	NO

THE PRODUCT HAS PASSED THE VISUAL INSPECTION:	YES	NO
Inspected by: Signature:	Date:	

FUNCTION TEST

9	Pressure reducer and pressure vessel can be connected without difficulties.	YES	NO
10	Left pressure gauge indicates pressure in pressure vessel.	YES	NO
11	Right pressure gauge indicates reduced pressure.	YES	NO
12	Reduced pressure can be regulated throughout the work area.	YES	NO
13	Stop valve is leak-tight.	YES	NO
14	Safety valve is NOT activated at a reduced pressure of 12 bar (174 psi).	YES	NO
16	Hose connector correctly connects to/disconnects from the controller's inlet coupling.	YES	NO
18	Connection between pressure reducer hose and pressure reducer is leak-tight.	YES	NO
19	Pressure reducer hose is leak-tight.	YES	NO
20	Connector of pressure reducer hose is leak-tight.	YES	NO

THE PRODUCT HAS PASSED THE FUNCTION TEST:	YES	NO
Tested by: Signature:	Date:	

ATTACHMENT 3: Visual and function test report: INFLATION HOSE

Please mark damages in the picture.

VISUAL INSPECTION

1	Coupling is not damaged.	YES	NO
2	Connector is not damaged.	YES	NO
3	Coupling and connector connect firmly.	YES	NO
4	Hose is not damaged.	YES	NO

THE PRODUCT HAS PASSED THE VISUAL INSPECTION:	YES	NO
Inspected by: Signature:	Date:	

FUNCTION TEST

6	Hose connector correctly connects to/disconnects from the controller's coupling.	YES	NO
7	Hose connector correctly connects to/disconnects from the bag's connector.	YES	NO
9	Connector is leak-tight.	YES	NO
10	Coupling is leak-tight.	YES	NO
11	Hose is leak-tight.	YES	NO

THE PRODUCT HAS PASSED THE FUNCTION TEST:	YES	NO
Tested by: Signature:	Date:	

ATTACHMENT 4: Visual and function test report: FITTING CONTROLLER

Please mark damages in the picture.

VISUAL INSPECTION

1	Inlet coupling is not damaged; it correctly connects to /disconnects from the hose of pressure reducer.	YES	NO
2	Outlet couplings are not damaged; they correctly connect to/disconnect from the hose.	YES	NO
3	Pressure gauges are not damaged; maximum working pressure indications are in place.	YES	NO
4	Pressure gauges are protected with protective caps, which are not damaged.	YES	NO
5	Stop valves are not damaged, they function smoothly	YES	NO
6	Safety valves are not damaged and have no visible faults.	YES	NO
7	Protective screws on safety valves can be tightened/untightened smoothly.	YES	NO

THE PRODUCT HAS PASSED THE VISUAL INSPECTION:	YES	NO
Inspected by: Signature:	Date:	

FUNCTION TEST

8	Connector of pressure reducer hose correctly connects to/ disconnects from controller's inlet coupling.	YES		NO	
		BRANCH 1		**BRANCH 2**	
9	Connector of inflation hose engages/disengages correctly the outlet coupling.	YES	NO	YES	NO
10	When the cock is open, the lifting bags is lifting.	YES	NO	YES	NO
11	Pressure change is within permissible values. (Enter pressure value on the controller at the beginning of the test and after 5 min) (Permissible pressure change is ±10% with regard to the pressure at the beginning of the test)	**Pressure at the beginning**	**Pressure after 5 min**	**Pressure at the beginning**	**Pressure after 5 min**
		YES	NO	YES	NO

If pressure drop exceeds permissible values, apply soapy water to the leak area at the outlet coupling.
If pressure increase exceeds permissible values, the filling valve of the controller is defective – the controller is not in good condition.
If pressure change lies within permissible values, the controller is leak-tight; the column for item 12 does not need be completed.

12	Outlet coupling is leak-tight.	YES	NO	YES	NO
13	Safety valve opens within permissible values. (Enter controller's working pressure values and pressure for opening the safety valve for each individual branch). (Permissible area of safety valve opening is from 1 to 1.1-times working pressure)	**Controller working pressure**	**Pressure of opening safety valve**	**Controller working pressure**	**Pressure of opening safety valve**
		YES	NO	YES	NO
14	**The controller's branch has passed the test.**	**YES**	**NO**	**YES**	**NO**
15	Inlet coupling of the controller is leak-tight.	YES		NO	

THE PRODUCT HAS PASSED THE FUNCTION TEST:	**YES**	**NO**
Tested by: Signature:	Date:	

ATTACHMENT 5: Visual and function test report: HAND-HELD CONTROLLER

Please mark damages in the picture.

VISUAL INSPECTION

1	Inlet coupling is not damaged and correctly connects to/disconnects from the hose of pressure reducer.	YES	NO
2	Outlet couplings are not damaged and correctly connect to/disconnect from the hose.	YES	NO
3	Pressure gauges are not damaged; maximum working pressure indications are in place.	YES	NO
4	Inflation control buttons are not damaged and function smoothly.	YES	NO
5	Deflation control buttons are not damaged and function smoothly.	YES	NO
6	Safety valves are not damaged and have no visible faults.	YES	NO
7	Housing and handle are not damaged and have no visible faults.	YES	NO

THE PRODUCT HAS PASSED THE VISUAL INSPECTION:	YES	NO
Inspected by: Signature:	Date:	

FUNCTION TEST

8	Connector of pressure reducer hose correctly connects to/ disconnects from the controller's inlet coupling.	YES		NO	
		BRANCH 1		**BRANCH 2**	
9	Connector of inflation hose correctly connects to/disconnects from the outlet coupling.	YES	NO	YES	NO
10	When inflation button is pressed, the lifting bag is inflated.	YES	NO	YES	NO
11	Pressure change is within permissible values. (Enter pressure value on the controller at the beginning of the test and after 5 min) (Permissible pressure change is ±10% with regard to the pressure at the beginning of the test)	**Pressure at the beginning**	**Pressure after 5 min**	**Pressure at the beginning**	**Pressure after 5 min**
		YES	NO	YES	NO

If pressure drop exceeds permissible values, apply soapy water to the leak area at the outlet coupling.
If pressure increase exceeds permissible values, the filling valve of the controller is defective – the controller is not in good condition.
If pressure change lies within permissible values, the controller is leak-tight; the column for item 12 does not need be completed.

12	Outlet coupling is leak-tight.	YES	NO	YES	NO
13	Safety valve opens within permissible values. (Enter controller's working pressure values and pressure for opening the safety valve for each individual branch). (Permissible range of safety valve opening is from 1 to 1.1-times of working pressure)	**Controller working pressure**	**Pressure of opening safety valve**	**Controller working pressure**	**Pressure of opening safety valve**
		YES	NO	YES	NO
14	**The controller's branch has passed the test.**	**YES**	**NO**	**YES**	**NO**
15	Inlet coupling of the controller is leak-tight.	YES		NO	

THE PRODUCT HAS PASSED THE FUNCTION TEST:	**YES**	**NO**
Tested by: Signature:	Date:	

ATTACHMENT 6: Visual and function test report: DEADMAN CONTROLLER – METALLIC

Please mark damages in the picture.

VISUAL INSPECTION

1	Inlet coupling is not damaged and correctly connects to/disconnects from the hose of pressure reducer.	YES	NO
2	Outlet couplings are not damaged and correctly connect to/disconnect from the hose	YES	NO
3	Pressure gauges are not damaged; maximum working pressure indications are in place.	YES	NO
4	Pressure gauges are protected with protective caps, which are not damaged.	YES	NO
5	Control levers are not damaged and function smoothly.	YES	NO
6	Safety valves are not damaged and have no visible faults.	YES	NO
7	Housing is not damaged.	YES	NO

THE PRODUCT HAS PASSED THE VISUAL INSPECTION:	YES	NO
Inspected by: Signature:	Date:	

FUNCTION TEST

8	Connector of pressure reducer hose correctly connects to/disconnects from the controller's inlet coupling.	YES			NO		
		BRANCH 1		**BRANCH 2**		**BRANCH 3**	
9	Connector of inflation hose correctly connects/disconnects from the controller's outlet coupling.	YES	NO	YES	NO	YES	NO
10	When the control lever is set to inflation position, the lifting bag is lifted.	YES	NO	YES	NO	YES	NO
11	Pressure change is within permissible values. Enter pressure value on test pressure gauge at the beginning of the test and after 5 min) (Permissible pressure change is ±10% with regard to the pressure at the beginning of the test)	**Pressure at the beginning**	**Pressure after 5 min**	**Pressure at the beginning**	**Pressure after 5 min**	**Pressure at the beginning**	**Pressure after 5 min**
		YES	NO	YES	NO	YES	NO

If pressure drop exceeds permissible values, apply soapy water to the leak area at the outlet coupling.
If pressure increase exceeds permissible values, the filling valve of the controller is defective – the controller is not in good condition.
If pressure change lies within permissible values, the controller is leak-tight; the column for item 12 does not need be completed.

12	Outlet coupling is leak-tight.	YES	NO	YES	NO	YES	NO
13	Safety valve opens within permissible values. (Enter controller's working pressure values and pressure for opening the safety valve for each individual branch). (Permissible range of safety valve opening is from 1 to 1.1- times of working pressure)	**Controller working pressure**	**Pressure of opening safety valve**	**Controller working pressure**	**Pressure of opening safety valve**	**Controller working pressure**	**Pressure of opening safety valve**
		YES	NO	YES	NO	YES	NO
14	**The controller's branch has passed the test.**	**YES**	**NO**	**YES**	**NO**	**YES**	**NO**
15	The inlet coupling of the controller is leak-tight.	YES			NO		

THE PRODUCT HAS PASSED THE FUNCTION TEST:	YES	NO
Tested by: Signature:	Date:	

ATTACHMENT 7: Visual and function test report: DEADMAN CONTROLLER – PLASTIC

Please mark damages in the picture.

VISUAL INSPECTION

1	Inlet coupling is not damaged and correctly connects to/disconnects from the hose of pressure reducer.	YES	NO
2	Outlet couplings are not damaged and correctly connect to/disconnect from the hose.	YES	NO
3	Pressure gauges are not damaged; maximum working pressure indications are in place.	YES	NO
4	Control levers are not damaged and function smoothly.	YES	NO
5	Housing and handle are not damaged and have no visible faults.	YES	NO

THE PRODUCT HAS PASSED THE VISUAL INSPECTION:	YES	NO
Inspected by: Signature:	Date:	

FUNCTION TEST

6	Connector of pressure reducer hose correctly connects to/disconnects from the controller's inlet coupling.	YES		NO	
		BRANCH 1		**BRANCH 2**	
7	Connector of inflation hose correctly connects to/ disconnects from the outlet coupling.	YES	NO	YES	NO
8	When the control lever is set to inflation position, the lifting bag is lifted.	YES	NO	YES	NO
9	Pressure change is within permissible values. (Enter pressure value on test pressure gauge at the beginning of the test and after 5 min) (Permissible pressure change is ±10% with regard to the pressure at the beginning of the test)	**Pressure at the beginning**	**Pressure after 5 min**	**Pressure at the beginning**	**Pressure after 5 min**
		YES	NO	YES	NO

If pressure drop exceeds permissible values, apply soapy water to the leak area at the outlet coupling.
If pressure increase exceeds permissible values, the filling valve of the controller is defective – the controller is not in good condition.
If pressure change lies within permissible values, the controller is leak-tight; the column for item 12 does not need be completed.

10	Outlet coupling is leak-tight.	YES	NO	YES	NO
11	Safety valve opens within permissible values. (Enter controller's working pressure values and pressure for opening the safety valve for each individual branch). (Permissible range of safety valve opening is from 1 to 1.1-times working pressure)	**Controller working pressure**	**Pressure of opening safety valve**	**Controller working pressure**	**Pressure of opening safety valve**
		YES	NO	YES	NO
12	**The controller's branch has passed the test.**	**YES**	**NO**	**YES**	**NO**
13	Inlet coupling of the controller is leak-tight.	YES		NO	

THE PRODUCT HAS PASSED THE FUNCTION TEST:	**YES**	**NO**
Tested by: Signature:	Date:	

ATTACHMENT 8: Visual and function test report: DEADMAN CONTROLLER IN CARRYING CASE

Please mark damages in the picture.

VISUAL INSPECTION

1	Inlet coupling is not damaged and correctly connects to/disconnects from the hose of pressure reducer.	YES	NO
2	Outlet couplings are not damaged and correctly connect to/disconnect from the hose.	YES	NO
3	Pressure gauges are not damaged; maximum working pressure indications are in place.	YES	NO
4	Pressure gauges are protected with protective caps, which are not damaged.	YES	NO
5	Control levers are not damaged and function smoothly.	YES	NO
6	Safety valves are not damaged and have no visible faults.	YES	NO
7	Case is not damaged.	YES	NO

THE PRODUCT HAS PASSED THE VISUAL INSPECTION:	YES	NO
Inspected by: Signature:	Date:	

FUNCTION TEST

8	Connector of pressure reducer hose correctly connects to/disconnects from the controller's inlet coupling.	YES		NO	
		BRANCH 1		**BRANCH 2**	
9	Connector of inflation hose correctly connects to/ disconnects from the outlet coupling.	YES	NO	YES	NO
10	When the control lever is set to inflation position, the lifting bag is lifted.	YES	NO	YES	NO
11	Pressure change is within permissible values. (Enter pressure value on test pressure gauge at the beginning of the test and after 5 min) (Permissible pressure change is ±10% with regard to the pressure at the beginning of the test)	**Pressure at the beginning**	**Pressure after 5 min**	**Pressure at the beginning**	**Pressure after 5 min**
		YES	NO	YES	NO

If pressure drop exceeds permissible values, apply soapy water to the leak area at the outlet coupling.
If pressure increase exceeds permissible values, the filling valve of the controller is defective – the controller is not in good condition.
If pressure change lies within permissible values, the controller is leak-tight; the column for item 12 does not need be completed

12	Outlet coupling is leak-tight.	YES	NO	YES	NO
13	Safety valve opens within permissible values. (Enter controller's working pressure values and pressure for opening the safety valve for each individual branch). (Permissible range of safety valve opening is from 1 to 1.1-times working pressure).	**Controller working pressure**	**Pressure of opening safety valve**	**Controller working pressure**	**Pressure of opening safety valve**
		YES	NO	YES	NO
14	**The controller's branch has passed the test.**	**YES**	**NO**	**YES**	**NO**
15	Inlet coupling of the controller is leak-tight.	YES		NO	

THE PRODUCT HAS PASSED THE FUNCTION TEST:	**YES**	**NO**
Tested by: Signature:	Date:	

Trelleborg Slovenija, d.o.o.

PA Environmental protection products (PA EKO)

We are a division of Trelleborg Slovenija d.o.o..
We manufacture and sell rubber products for environmental protection and rescue operations and industrial use. Our growing division was established more than thirty years ago and is constantly striving to meet our customer's current and future needs and expectations.

WWW.SAVATECH.EU
WWW.SAVATECH.COM

Instructions for Use: High-Pressure Lifting Bags

Environmental protection products
phone: +386 (0)4 206 6388
e-mail: info.eko@savatech.si
fax: +386 (0)4 206 6390

Škofjeloška cesta 6, 4000 Kranj, Slovenia

11/2019