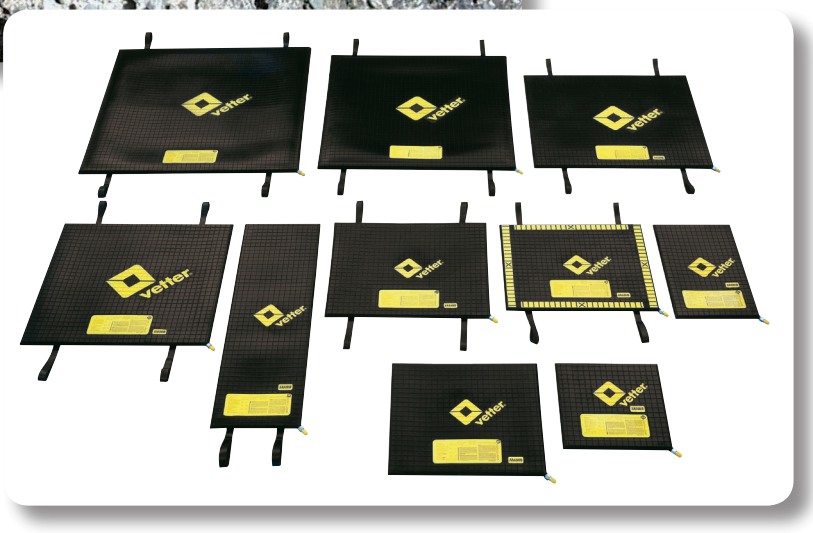
Emergency Pneumatics.

Operating Instructions

VETTER Mini-Lifting Bags 8.0 bar



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Contents

1. Important preliminary remarks

Only knowledge and the exact observance of this operating manual guarantee correct and reliable operation, achieve the best possible usage and ensure any claims made within the framework of the Vetter guarantee.

Only staff are to use Vetter mini-lifting bags who have been instructed in their use by the manufacturer's operating manual and operating instructions.

The operating instructions given here are to be regarded as part of the product and are to be kept for the complete life duration of the product. In case the product should be passed on to a successive user then the operating instructions must also be included.

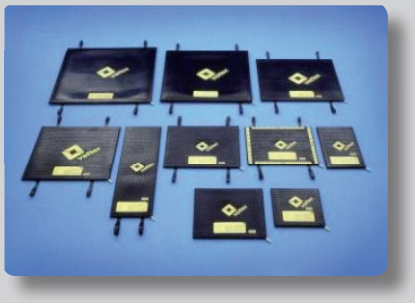
2. Description of the product

All Vetter Mini-Lifting Bags 8.0 bar are produced by hand in a layer structure and are made of high quality raw material so that a seamless bag is created as the finished product.

2.1 Description of the set

a. Mini-Lifting Bags

Bag size selection is made according to the task. There are 16 different sizes from 1.1 t to 67.7 tons with a choice of steel cord or aramide reinforcement. There is no difference in performance between Mini-Lifting Bags having the same size with steelcord and those with Aramide. Aramide bags are lighter than Lifting bags made of steel cord (when comparing bags in the same size).



b. Inflation hoses

There are inflation hoses available (5 m and 10 m in length) which enable the user to control the Mini-Lifting Bags from a safe position. The colours of the hoses, RED and YELLOW, avoid any confusion during control of the different sides (inlets and outlets) of mini-Lifting Bags.

c. Dual deadman controller 8 bar in plastic housing

Connect the inflation hoses to the outlet coupling on the rear side of the controller. Connect the air supply to the inlet coupling. Move the control lever to the front in order to inflate the Mini-Lifting Bag. In doing this, observe the corresponding manometer and load.

Release the control lever, thus ending the inflation process, when the required operating required operating pressure for the lift power or lift height is reached. The control lever automatically returns to the center position (zero) when released (deadman

switched). The built-in safety valve automatically activates when the bag is unintentionally over-inflated above the maximum operating pressure of 8 bar or when there is an increase in pressure of 8 bar or when there is an increase in pressure in the bag due to a unforeseen loading of the bag.

The activation tolerance for opening and closing of the safety valve can be +/- 10 %.

Press the control lever in the opposite direction in order to deflate the bag or to reduce the load.

d. Dual deadman controller 8 bar, aluminium

Press down the lower button (1) in order to inflate the bag. Inflation is stopped when the button is released and it returns back to the zero position. The bag is released by pressing the upper button (2).

e. Single deadman controller 8 bar, aluminium

The single deadman controller, on the left, can be used when only one Mini-Lifting Bag is to be used.

The single and dual controllers in the 8 bar fitting version do not correspond to the requirements of the Fire Service standard DIN EN 13 731!

f. Dual controller 8 bar, fitting

Controller with inflation regulator using a ball valve without deadman switching. To empty the bag, open the head of the safety valve (1) by turning to the left. Close the safety valve by turning to the right after deflation.

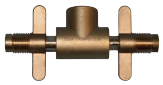
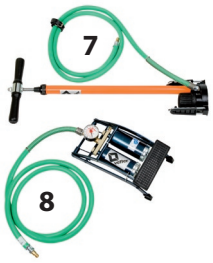
g. Single controller 8 bar, fitting

The same version as described in e) but used for the control of only one Mini-Lifting Bag.

Inventory of items

An inventory and check of all items in the delivery package is to be made according to the delivery documentation when acceptance of the Mini-Lifting Bag equipment is carried out. A visual check and function check is also to be made as specified in the operating manual.

2.2 Additional accessories

Pos.	Article No.	Description	
1	1600 0105 00	**Comp. air bottle 10 l / 200 bar**	
2	1600 0091 00	**Comp. air bottle 6 l / 300 bar**	
3	1600 0084 00	**Dual connector 200 bar**	
4	1600 0091 00	**Dual connector 300 bar**	
5	1600 0120 00	**Adapter for construction site compressor**	
6	1600 0145 00	**Pressure regulator**	
7	1600 0087 00	**Hand pump (7)**	
8	1600 0094 00	**Foot pump (8)**	

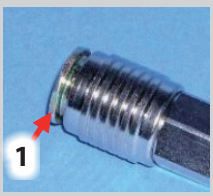
2.3 The Vetter safety coupling system

a. Inlet coupling controller

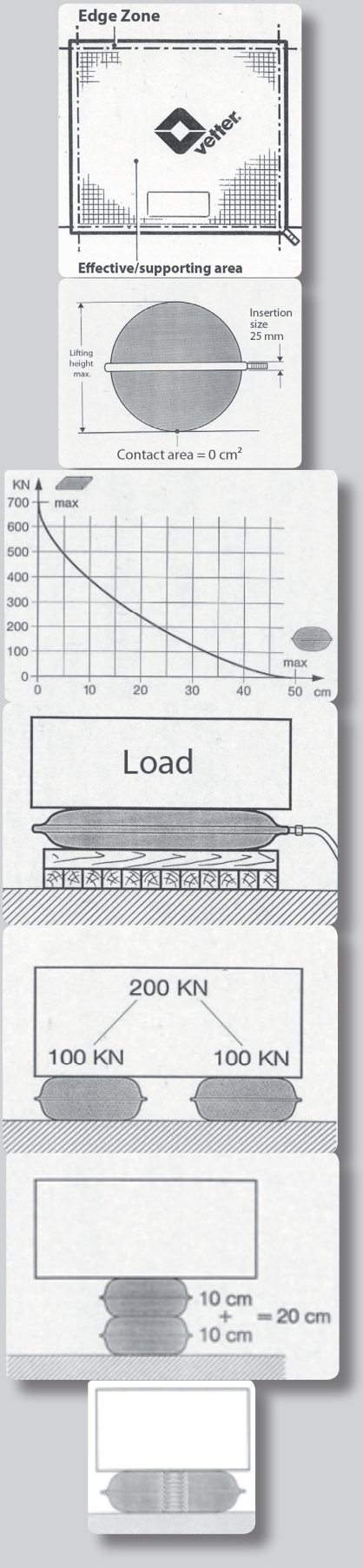
Connect the air supply hose, resp. Connection hose of the pressure reducer, to the plug nipple of the inlet coupling on the controller. In doing this, firmly press the nipple into the the coupling until it latches in. Turn the brass sleeve of the coupling opposite to the safety pin for additional safety.

b. 8 bar inflation coupling

Firmly press the hose, resp. bag nipple, into the coupling until it latches in order to connect the inflation hose with the corresponding controller, resp. with the Mini-Lifting Bag. The coupling sleeve must lay on the support ring without any gap (1).



The nipple must be firmly pressed against the spring pressure in the coupling in order to release the connection (only in pressure-free condition). At the same time, the coupling sleeve must be pulled back. The connection is then released.



2.4 Effectiveness

Lifting bags with side wall (e.g. Vetter Lifting Bag 1.0 bar) achieve their maximum height by the expansion of the side wall material. Mini-Lifting Bags do not have a side wall and therefore achieve their lifting effect by a shape change, i.e. both surfaces curve outwards.

In order to use maximum lift strength, the whole effective area, i.e. the complete area minus the edge zone, must be completely under the load to be lifted and the maximum operating pressure applied. **A Mini-Lifting Bag develops the maximum lifting power at the beginning of the lift path!**

The bag develops a spherical shape as the lift height increases. This is the reason why the contact area with the load decreases until at a max. bag curvature this will be almost zero. **The largest lift height of the Mini-Lifting Bag will only be reached in the unloaded state.**

2.5 Effective load movement

Load path diagram for the individual Mini-Lifting-Bags are given on request. The lift power (resulting from contacting surface and pressure) is only available when the first bag curvature contacts the load.

The lower the space distance between load and Mini-Lifting Bag, the greater the lift power. In order to fully use the strengths of the Mini-Lifting Bag, the distance between load and bag should be at a minimum.The under-support must be at least as large as the applied Mini-Lifting Bag and must not be higher than the smallest side length.

In case the lift power produced by one Mini-Lifting Bag is not sufficient then a number of bags can be positioned next to each other when the load is slip-free. However, a separate controller must be used for each bag.

If the lift power of only one Mini-Lifting Bag is not sufficient then a maximum of two bags can be placed on top of each other when the load is slip-free. This configuration has an additive effect for the lift height of both Mini-Lifting Bags. The lift power only corresponds to that of the smaller bag!

Never position 3 or more bags on top of each other!

A Mini-Lifting Bag under load reacts the same as a spring under tension! As soon as the Mini-Lifting Bag is quickly relieved of the load, e. g. slipping, load breakage etc., then the Mini-Lifting Bag will be rapidly catapulted outwards!

Never stand in front of the Mini-Lifting Bag! Danger area!

2.6 Correct handling and usage

The Mini-Lifting Bag is primarily a pneumatic (normally with air) rescue device used by the rescue services (e.g. fire services) with which trapped people can be freed, access gained for rescue and many other tasks. The Mini-Lifting Bag can also be used as a working device in order to lift or move loads. Mini-Lifting Bags meet the requirements for fire services as specified in GUV-G 9102. Additional instructions are to be found in the user's own operating instructions.

2.7 Safety instructions

Only prespecified protective clothing is to be worn during operation. The national regulations are to be observed in connection with lifting bag systems and their use. Mini-Lifting bags must only be used with compressed air. It is imperative that no inflammable or aggressively acting gases be used.

Mini-Lifting bags must only be inflated with original Vetter fittings due to the fact that these have been subjected to an acceptance test. The lifting bag system is to be inspected before and after operation to see that it is in a correct and perfect condition.

Never place more than 2 Mini-Lifting Bags over each other.

Ensure against slippage. Continually prop up loads being lifted during the lifting procedure. Always ensure that the substructure material is in a stable condition when constructing the support.

The support must at least cover the whole bag area and should be larger in length and width than in height! Danger of slippage! During support construction never place metal on metal!

With slippery ground (ice, snow, clay etc.) place stones, branches similar objects underneath the bag in order to increase ground or grip. Avoid pointed objects, such as screws, spikes etc. Never place bags on sharp edges or objects which are hot. Use suitable layers of lining and cover the complete positioning area of the bag. Protect the bag from sparks coming from welding or cutting work. Do not subject bags to heavy loads such as hydraulic stamps, winches or falling objects.

Do not stay underneath a load being lifted, never hold or touch the load from underneath ! Remain at a safe distance from the load!

Avoid shearing effects by squeezing the bag during deflation!

Never stand in front of the load but always at the side of it because under unfavourable conditions it may swing out!

3. Preparing the product for use

3.1 Preparations for operation

Remove a set of lifting bags from the vehicle. Ensure sufficient air supply.

Only perfectly operating and inspected Mini-Lifting Bag systems are to be used.

The method and type of application is to be decided from case to case by the operation leader with his own area of responsibility as well as the operating instructions of the user.

3.2 Application instructions

Move the lifting bag to a suitable position so that at least 75% of the supporting bag area is under the load. Continually built up the under-support for maintaining contact when the load is lifted during the lifting procedure.

Never stand in front of the bag during operation but to the side of the Mini-Lifting Bag because it could be catapulted outwards under unfavourable conditions.

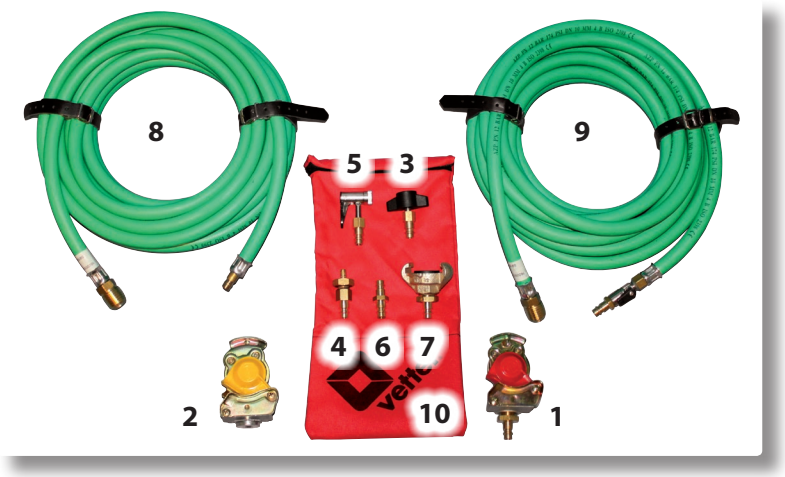
4. Operating instructions

4.1 Operation with compressed air bottles

Connect the pressure reducer to the compressed air bottle (200 or 300 bar) using the T-Screw (1). Close the valve of the reducer (2). Open the valve on the bottle (3). The manometer (4) indicates the pressure in the bottle. Adjust the backpressure to approximately 10 bar using the regulator lever (5) (indication of reduced pressure on the backpressure manometer (6)). Connect air hose of the pressure reducer to the controller. Open the valve on the pressure reducer (2).

4.2 Operation with other compressed air supplies

Basically, any air supply which is available can be used for operation of Mini-Lifting Bags as long as the pressure does not exceed 10 bar and the air is free of oil. Amongst others, the set of transition pieces (Art. No.: 1600 0125 01) with the following adapters are available for operation with other air sources:



1. Truck compressed air connection, dual brake system.
   For tapping air out of the trailer coupling head.
2. Dummy coupling
   Seals off the control line of the brake system

Remember! Ensure that the truck does not roll, use brake blocks!

3. Truck tyre inflation device adapter
   For tapping off air from the so-called tyre inflation bottle near the brake.

Remember! The tyre inflation connection must be ensured by a safety valve as a standard (blow-off pressure approximately 7.5 bar)!

4. Truck tyre valve
   Inflation with a normal hand or foot pump as well as other air supplies for tyre inflation.
5. Truck tyre valve connection, can be clamped
   For extracting air for the spare tyre.
6. Adapter for the local air pressure network.
7. Adapter Construction-site compressor
8. Air supply hose, 10 m, green.
9. Air supply hose, 10 m, green, with blocking valve.
10. Case, red

4.3 Limit for the period of use

Mini-Lifting Bags are subject, the same as other rubber products, to natural aging. The first sign of material aging is the loss of flexibility, this is especially seen in the formation of „age cracks". If these cracks propagate so far along the upper layer so that the supporting cord layer (steel or Aramide) is no longer fully insulated then this can quickly limit the tear resistance of the bag wall. This can cause wall tearing and thus lead of bursting.

The experiences over the past decade have clearly shown that the failure rate in general for rubber products considerably increases with application periods exceeding 15 years. Therefore Mini-Lifting Bags should be replaced after 15 to 17 years of use at the latest. The danger for operational services using over-aged Mini-Lifting Bags must never be under-estimated, alone due to the consideration aspect. Although at present there is no regulation about the time limit for the maximum period of use, the responsibility for this lies wholy and soly with the user, resp. the person who has been commissioned by him to carry out testing.

4.4 Care and storage

The lifting bag equipment is to be cleaned after each operation. Cleaning is normally carried out with warm water and a detergent.

Cleaning must never be carried out with a chemical cleaning agent and never with high-pressure hot water devices.

Drying is made at normal room temperature.

DIN 7716 is to be observed with long storage periods.

5. Trouble-shooting for faults

If the safety valve blows too early because of foreign body penetration caught up inside then the blow-off valve is to be fully opened on the head of safety valve by turning counter-clockwise so that the compressed air can escape. If, due to this, the foreign body is not removed then the upper part of the safety valve is to be unscrewed when the safety valve is disassembled. To do this, position the pipe wrench in the centre and unscrew by turning to the left.

Carefully take out the valve ball and remove foreign body. Firmly screw on the upper part of the valve again, assemble the safety valve and check operation. The set pressure must not be changed.

Should the sealing or sealing plate on the upper part of the valve be removed then correct operation can no longer be guaranteed.

The safety valve is to be exchanged.

If operational faults occur on the pressure reducer or controller due to icing at high air humidity in connection with low temperatures then a normal defrosting agent (the same as in cars) should be used.

6. Repetitive tests

Lifting bag systems are to be subjected to repetitive tests according to DIN EN 13731 and national regulations (e.g. GUV-G 9102).

- ✓ Testing on acceptance
  Testing for completeness by the person/people delegated by the user.
  Visual check and operation test by a trained person according to the operation manual.
- ✓ Visual check and operation test after each application/use by a trained person.
  This test is to be documented.
- ✓ The lifting bag system is to be subjected at least once every year to a visual check and operation test by a trained person according to the following check list.
  This test is to be documented.
- ✓ The lifting bag system is to be given a pressure test, by user or manufacturer, according to DIN EN 13 731 and recommendation of the manufacturer, every 5 years or if there is any doubt about the safety or reliability.

The user is responsible for the correct and professional execution of the repetitive tests.

Lifting bags or lifting bag systems are not subject to the requirements specified in EC Guidelines 97/123/EC, Section: 3.15.

Visual check:

A visual check should be made for the following types of damage:

- ✓ Damage caused by separation
- ✓ Damage caused by cuts
- ✓ Damage caused by puncture
- ✓ Damage caused by heat and acids

The bag must be immediately discarded if, during inspection, established that there is damage and that the support cord (steel or ARAMIDE) shows through. Repair is not possible. Danger of bursting!

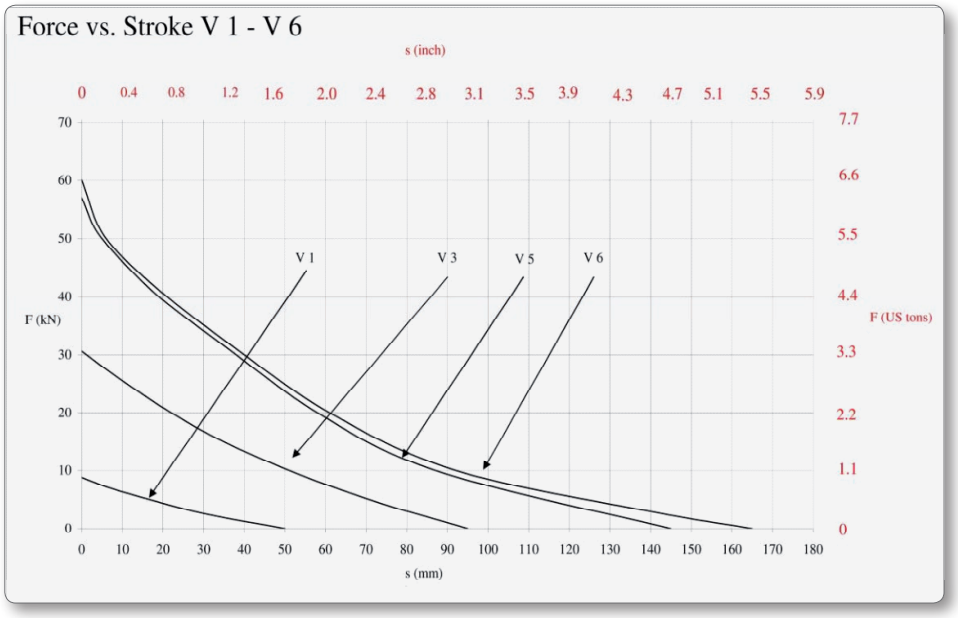
7. Technical Data

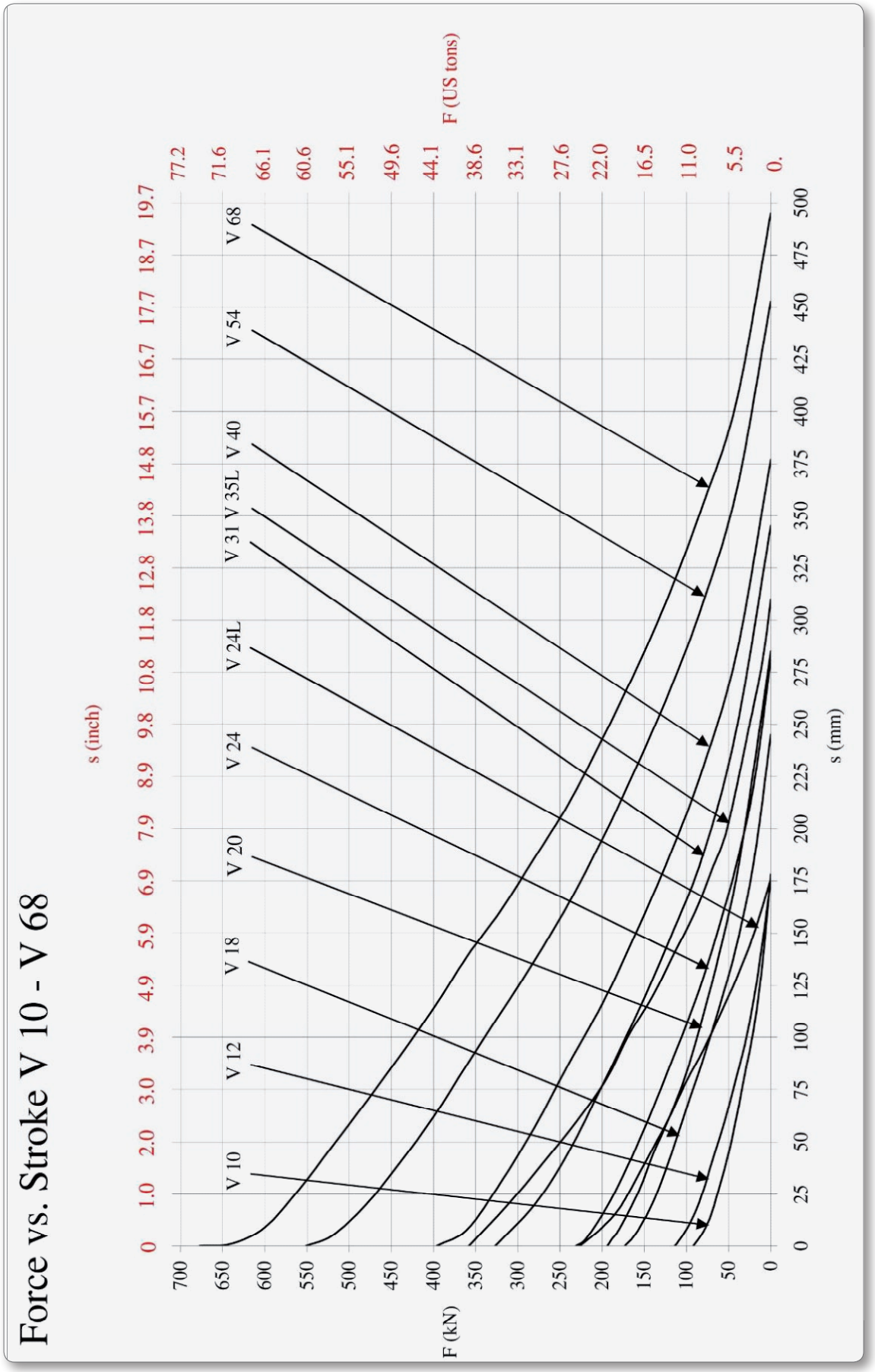
Mini- Lifting Bags steelcord reinforcement							
Type		**V 10**	**V 12**	**V 18**	**V 20**	**V 24**	**V 24 L**
Art.-No.		1310000600	1310001000	1310001100	1314002100	1310001200	1310001300
Lift power,max	to	9.6	12.0	17.7	19.4	24.0	24.0
	US tons	10.6	13.2	19.5	21.4	26.5	26.5
Lift height, max	cm	20.3	20.0	27.0	28.0	30.6	20.1
	inch	8.0	7.9	10.6	11.0	12.0	7.9
Size	cm	37x37	32x52	47x52	48x58	52x62	31x102
	inch	15x15	13x20	19x20	19x23	20x24	12x40
Insertion height	cm	2.5	2.5	2.5	2.5	2.5	2.5
	inch	0.98	0.98	0.98	0.98	0.98	0.98
Nom. content	l	9.2	10.7	21.7	24.9	32.9	23.5
	cu.ft.	0.3	0.4	0.7	0.9	1.2	0.8
Air capacity	l	82.8	96.3	195.3	224.1	296.1	211.5
	cu.ft.	2.9	3.4	6.9	7.9	10.4	7.5
Operating pressure max.	bar	8	8	8	8	8	8
	psi	116	116	116	116	116	116
Test pressure	bar	16	16	16	16	16	16
	psi	232	232	232	232	232	232
Weight	kg	4.5	5.4	7.9	9.1	10.3	10.2
	lbs	9.9	11.9	17.4	20.1	22.7	22.5
Type		**V 31**	**V 35 L**	**V 40**	**V 48**	**V 54**	**V 68**
Art.-No.		1310001400	13100008200	1310001500	1310012400	1310001600	1310001700
Lift power,max	to	31.4	35.8	39.6	49.3	54.4	67.7
	US tons	34.6	39.5	43.7	54.3	60.0	74.6
Lift height, max	cm	37.0	31.0	40.2	45.5	47.8	52.0
	inch	14.6	12.2	15.8	17.9	18.8	20.5
Size	cm	65x69	43x115	78x69	82x82	86x86	95x95
	inch	26x27	17x45	31x27	32x32	34x34	37x37
Insertion height	cm	2.5	2.5	2.5	2.8	2.8	2.8
	inch	0.98	0.98	0.98	1.1	1.1	1.1
Nom. content	l	57.5	38.8	75.0	100.0	124.2	161.9
	cu.ft.	2.0	1.4	2.6	3.5	4.3	5.7
Air capacity	l	517.5	349.4	675.0	900.0	1,117.8	1,457.1
	cu.ft.	18.0	12.3	23.6	31.8	39.5	51.4
Operating pressure max.	bar	8	8	8	8	8	8
	psi	116	116	116	116	116	116
Test pressure	bar	16	16	16	16	16	16
	psi	232	232	232	232	232	232
Weight	kg	14.2	15.1	17.1	21.4	28.4	35.0
	lbs	31.3	33.3	37.7	47.2	62.4	77.2

Mini- Lifting Bags aramide reinforcement							
Type		**V 1**	**V 3**	**V 5**	**V 6**	**V 10**	**V 12**
Art.-No.		1314009300	1314009500	1314018200	1314009600	1314002200	1314002400
Lift power,max	to	1.0	3.3	5.7	6.4	9.6	12.0
	US tons	1.1	3.6	6.3	7.0	10.6	13.2
Lift height, max	cm	7.5	12.0	14.5	16.5	20.3	20.0
	inch	3.0	4.7	5.7	6.5	8.0	7.9
Size	cm	14x13	25.5x20.0	28x28	29.5x29.5	37x37	32x52
	inch	5.5x5.1	10x7.9	11x11	11.6x11.6	15x15	13x20
Insertion height	cm	2.5	2.5	2.5	2.5	2.5	2.5
	inch	0.98	0.98	0.98	0.98	0.98	0.98
Nom. content	l	0.30	1.75	3.16	4.4	9.2	10.7
	cu.ft.	0.01	0.06	0.11	0.16	0.30	0.40
Air capacity	l	2.7	15.8	28.4	39.6	82.8	96.3
	cu.ft.	0.1	0.6	1.0	1.4	2.9	3.4
Operating pressure max.	bar	8	8	8	8	8	8
	psi	116	116	116	116	116	116
Test pressure	bar	14	14	14	14	14	14
	psi	203	203	203	203	203	203
Weight	kg	0.5	1.0	1.4	1.9	3.3	3.9
	lbs	1.1	2.2	3.1	4.2	7.3	8.6
Type		**V 18**	**V 20**	**V 24**	**V 24 L**	**V 31**	**V 35 L**
Art.-No.		1314002500	1314003400	1314002600	1314002700	1314002800	1314018300
Lift power,max	to	17.7	19.4	24.0	24.0	31.4	35.8
	US tons	19.5	21.4	26.5	26.5	34.6	39.5
Lift height, max	cm	27.0	28.0	30.6	20.1	37.0	31.0
	inch	10.6	11.0	12.0	7.9	14.6	12.2
Size	cm	47x52	48x58	52x62	31x102	65x69	43x115
	inch	19x20	19x23	20x24	12x40	26x27	17x45
Insertion height	cm	2.5	2.5	2.5	2.5	2.5	2.5
	inch	0.98	0.98	0.98	0.98	0.98	0.98
Nom. content	l	21.7	24.9	32.9	23.5	57.5	38.8
	cu.ft.	0.7	0.9	1.2	0.8	2.0	1.4
Air capacity	l	195.3	224.1	296.1	211.5	517.5	349.4
	cu.ft.	6.9	7.9	10.4	7.5	18.0	12.3
Operating pressure max.	bar	8	8	8	8	8	8
	psi	116	116	116	116	116	116
Test pressure	bar	14	14	14	14	14	14
	psi	203	203	203	203	203	203
Weight	kg	5.7	6.2	7.2	6.8	10.1	10.0
	lbs	12.6	13.7	15.9	15.0	22.3	22.1

Type		V 40	V 48	V 54	V 68
Art.-No.		1314002900	1314028300	1314003000	1314003100
Lift power,max	to	39.6	49.3	54.4	67.7
	US tons	43,7	54.3	60.0	74.6
Lift height, max	cm	40.2	45.5	47.8	52.0
	inch	15.8	17.7	18.8	20.5
Size	cm	78x69	82x82	86x86	95x95
	inch	31x27	32x32	34x34	37x37
Insertion height	cm	2.5	2.8	2.8	2.8
	inch	0.98	1.1	1.1	1.1
Nom. content	l	75.0	100.0	124.2	161.9
	cu.ft.	2.6	3.5	4.3	5.7
Air capacity	l	675.0	900.0	1,117.8	1,457.1
	cu.ft	23.6	31.8	39.5	51.4
Operating pressure max.	bar	8	8	8	8
	psi	116	116	116	116
Test pressure	bar	14	14	14	14
	psi	203	203	203	203
Weight	kg	12.2	14.4	17.3	20.7
	lbs	26.9	31.8	38.1	45.6

8. Diagrams: Force vs. Stroke




Force vs. Stroke V 10 - V 68
s (inch)
0 1.0 2.0 3.0 3.9 4.9 5.9 6.9 7.9 8.9 9.8 10.8 11.8 12.8 13.8 14.8 15.7 16.7 17.7 18.7 19.7
77.2 71.6 66.1 60.6 55.1 49.6 44.1 38.6 33.1 27.6 22.0 16.5 11.0 5.5 0.
F (US tons)
V 10 V 12 V 18 V 20 V 24 V 24L V 31 V 35L V 40 V 54 V 68
700 650 600 550 500 450 400 350 300 250 200 150 100 50 0
F (kN)
0 25 50 75 100 125 150 175 200 225 250 275 300 325 350 375 400 425 450 475 500
s (mm)

9. List of possible dangers according to EN 12100-1 and EN 12100-2

Danger		see Page
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A.3	**Material danger**	
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4.3	Mental over and under demands, stress etc.	3
4.4	Human error	3
4.5	Unfavourable arrangement of visual indications	4
A.5	**Unintended movements**	
5.1	Faults/erroneous functions of the control elements	11
A.6	**Mechanical failure**	
6.1	Failure of energy supplies	9 / 12
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7.3	due to the control device	8 / 9
7.5	Movements	8 / 9
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7.9	Movement of parts from the stationary position	8 / 9
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7.12	Falling loads	11
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7.19	The effects of loads on persons	3
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7.21	Fire and explosion	3 / 4
7.22	Control failure	3

EC Conformity Declaration

in accordance with Directive 2006/42/EC

Manufacturer name and address

Vetter GmbH
A Unit of IDEX Corporation
Blatzheimer Str. 10 - 12
53909 Zülpich

We hereby declare that the Mini Lifting Bags (Steelcord and Aramide) for lifting and lowering loads

Type: _____
Serial-No.: _____
Model: _____
(refer to equipment label, to be entered by the customer)

meets the following relevant provisions:

Directive 2006/42/EC on Machinery

Applied harmonised standards, references to which have been published in the Official Journal of the European Union:

DIN EN ISO 12100
EN 13731

Applied national standards and technical specifications:

Authorised representative for the compilation of technical documents:

Vetter GmbH
A Unit of IDEX Corporation
Blatzheimer Str. 10 - 12
53909 Zülpich

This EC Conformity Declaration was issued:

Zülpich, 16.03.12
(Place, Date, Signature) (Identification of signatory)

Place your trust in emergency pneumatics!

We are the company who can help you, find a solution to your problem!

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