PLACE
SERIAL
NUMBER
LABEL
HERE

VACUHAND
PRO CRANE
LIFTER
USER MANUAL

DOCUMENT ID: 12172021

Have Questions?

We're here for you.

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RON I

LIFT-O-FLEX

MOBI-Crane | movomech | Voyager

R ON I
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IMPORTANT: READ MANUAL CAREFULLY

Use the equipment strictly as intended to prevent injury or damage. Familiarize yourself with safety guidelines and operational instructions. For any questions or concerns, contact our office promptly.

Table of contents

1. Safety

RonI's equipment is manufactured in accordance with the latest technological advances, and according to the latest applicable European standards and directions. The aim of this documentation is to provide the user with practical instructions for safe operation and simple maintenance of the equipment.

Anyone who deals with the installation of the equipment (including related equipment), operational procedure, use, maintenance, and/or repair functions must have read and understood:

- the instruction manual,
- the safety regulations, and
- the safety instructions for each individual section.

In order to avoid misuse and to ensure the reliable operation of the products, we recommend that the instruction manual is always available to the user/operator.

Intended usage

The equipment is intended exclusively for transportation, lifting and lowering of load. Any other use, including the towing of a load and the transportation of passengers, is prohibited (see below for more examples). RonI does not accept responsibility for damage caused by such use. All risks are the sole responsibility of the user.

The equipment may only be used in perfect technical condition by trained staff, and in accordance with current safety and work protection regulations. Furthermore, the user must observe operational and maintenance conditions contained in the instruction manual. Severe personal injury and damage to equipment can be caused by:

- removal of covers and casings,
- non-professional installation of equipment,
- incorrect usage, or
- insufficient maintenance.

Prohibited usage

Certain types of activities and operations are prohibited, as in specific circumstances they can cause personal injury as well as permanent damage to the construction. For example:

- It is prohibited to convey passengers using the equipment.
- Never transport suspended loads above anyone's head.
- Never drop a suspended load, and make sure it is lifted in a straight line.
- Never loosen secured or fastened loads by using the equipment.
- Do not overload.
- Do not leave a suspended load unattended.

General safety aspects

The instruction manual should always be kept within easy reach of the equipment. It contains important safety information and sections that relate to guidelines, norms, and regulations. Failure to follow the safety regulations in this instruction manual may result in personal injury or death.

In addition to the instruction manual, generally applicable regulations and rules must be followed and adhered to in order to avoid accidents and protect the environment. This also applies to regulations relating to the handling of products dangerous to the environment and the use of personal safety equipment.

As regards all work associated directly or indirectly with the equipment, the user must follow and adhere to all the above regulations as well as current work protection and safety regulations. In spite of this, a life-threatening risk still prevails in cases where the equipment is used and operated by non-trained or non-instructed staff in a non-professional or non-intended way.

The user should supplement the instruction manual with instructions that consider the nature of the operation, e.g. company organisation, work procedures, and number of staff.

The members of staff who are assigned to work with the equipment must have read the instruction manual prior to undertaking any work, and he/she should pay particular attention to the chapters containing safety instructions. It is too late once work has commenced. This applies in particular to members of staff who are working with the equipment on a temporary basis, e.g. for maintenance purposes.

When convenient, the staff should be tested on their knowledge of the manual's contents that relate to safety and accident awareness.

The user is responsible for ensuring that the equipment is used only when it is in perfect condition and that all applicable and relevant safety regulations and requirements are followed.

The equipment should be taken out of operation immediately if functional damage or defects are discovered.

Personal safety equipment should be used as and when necessary, or when required by regulations.

Safety and warning devices, such as signs, stickers and labels must not be removed or made illegible.

All safety and warning devices on or adjacent to the equipment should be complete and maintained in a legible/functional condition.

All changes, extensions or reconstruction that may affect safety are forbidden without written permission from RonI. This also applies to assembly and adjustment of safety equipment and welding of structural parts.

Spare parts must comply with Movomech's stated technical requirements. This compliance is guaranteed when original spare parts are used. The intervals prescribed or stated in the instruction manual for regular testing/inspection must be adhered to!

Staff selection and qualifications

Reliable staff must carry out work with/on the equipment. Regulations that apply to under-age persons must be followed.

The user is responsible for supplying necessary training and instructions to those that he/she employs, including professionals and/or apprentices.

It is recommended that the user draws up instructions and guidelines relating to the causes of errors, communicates these to the relevant staff, and posts directions on appropriate and clearly visible places.

It is recommended that the user makes sure that the knowledge of the staff is adequate as regards the following points, prior to the operation of the construction:

- knowledge of the contents of the instruction manual,
- knowledge of the safety and user regulations contained therein,
- and knowledge of applicable work protection regulations.

Only trained and instructed staff should be permitted to work with the equipment. Parameters relating to use, maintenance, and installation should be clarified.

Safety instructions for usage

The only persons allowed to work on the electrical equipment are competent staff members who work in accordance with regulations and standards for high-voltage equipment.

No persons under the influence of drugs, alcohol or medication which affects their ability to react, are allowed to use, maintain, or repair the construction.

All stated actions and instructions relating to work protection and issues relating to general safety and protection of workers that should be carried out or studied prior to, during or following operation must be followed to the letter. Failure to do so may result in fatal accidents.

The equipment should be stopped or taken out of operation at the time of detection of faults relating to work protection and operational accessibility.

Safety equipment must not be deactivated, altered or used in a way that conflicts with applicable regulations.

Appropriate actions must be taken to ensure safe operation and functional conditions for the user.

The equipment should only be used when all protective and safety equipment, such as detachable guards and emergency stop devices, are in place and in working order.

Any type of modification and alteration of the equipment is prohibited. However, this does not apply to lesser changes that do not affect the strength, operational safety or work protection, or to actions which promote an increased level of safety.

The fundamental responsibility for these changes lies with the user. If in doubt, contact RonI for written approval of the actions prior to implementation.

The equipment should be stopped and locked immediately when functional faults occur. Faults should be corrected immediately!

Following an ”emergency stop” the user has to wait for the cause of the disruption to be repaired and for an assurance that there is no further danger before he/she reconnects the equipment and resumes operation.

The equipment should be disconnected immediately in the following cases:

- in case of damage to the pneumatic / electrical / mechanical equipment, and
- in case of malfunctioning personal protective equipment.

Specific local circumstances or applications may lead to situations that were unknown at the time of writing this document. In such cases, the user must ensure safe operation and disconnect the equipment until measures to maintain safe operation have been carried out in conjunction with RonI or other authorised party.

Ensure that no one can become injured when they use the equipment prior to connecting/activating the equipment.

If the user notices the presence of persons who may become injured during operation, the operation should be discontinued immediately and must not be resumed until these persons have left the dangerous area.

The user must make sure that the equipment is in a perfect and operationally safe condition prior to all operations using the equipment.

The user should carry out all prescribed safety measures and make sure that automated procedures are completed when the equipment is disconnected (e.g. when there are deficiencies as regards operational and personal safety, an emergency situation exists, repair or maintenance is being carried out, damage is noticed or at the completion of work).

Work with the equipment is only allowed when the operator has been instructed to do so by his superior, and if the operator has knowledge of the equipment and its function.

2. Description

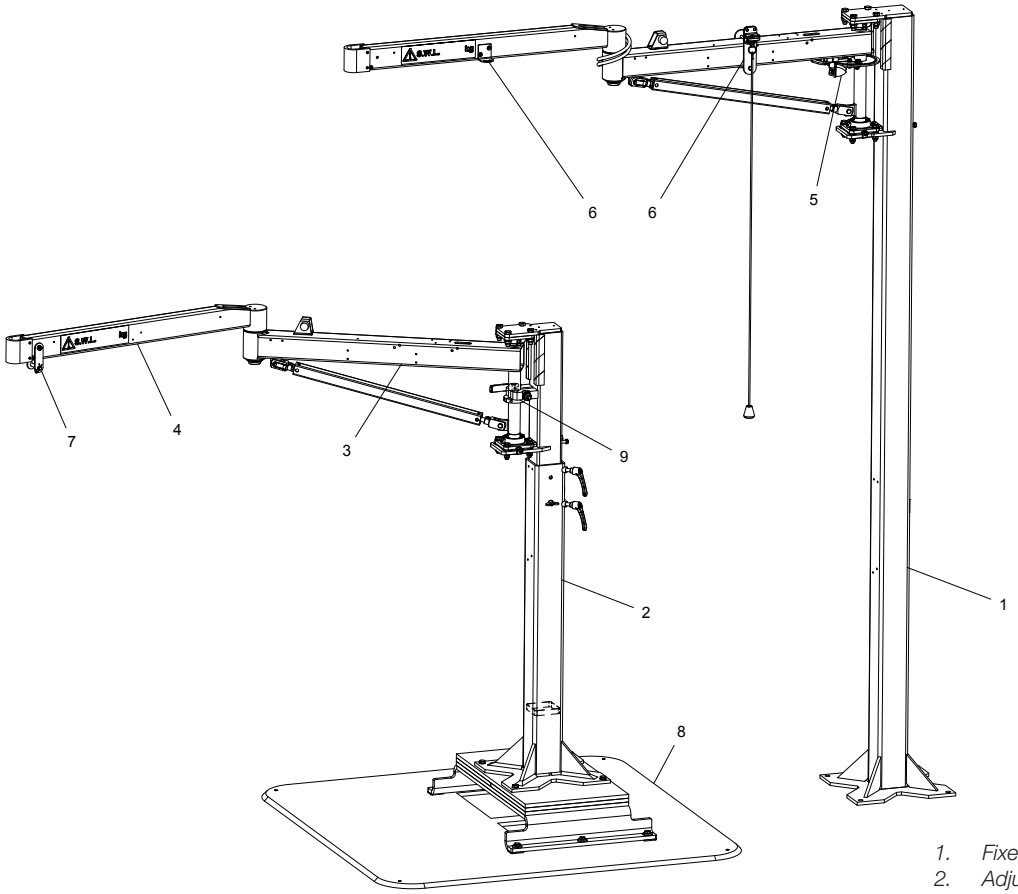
MobiArm is a folding arm crane to be used together with any lifting equipment. The maximum load is 125kg

The crane unit consists of the tower and the inner and outer arms. The crane can be attached to the floor with expander bolts or mounted on a mobile foot plate

MobiArm has an inner and an outer arm which can be delivered in 3 different sizes.

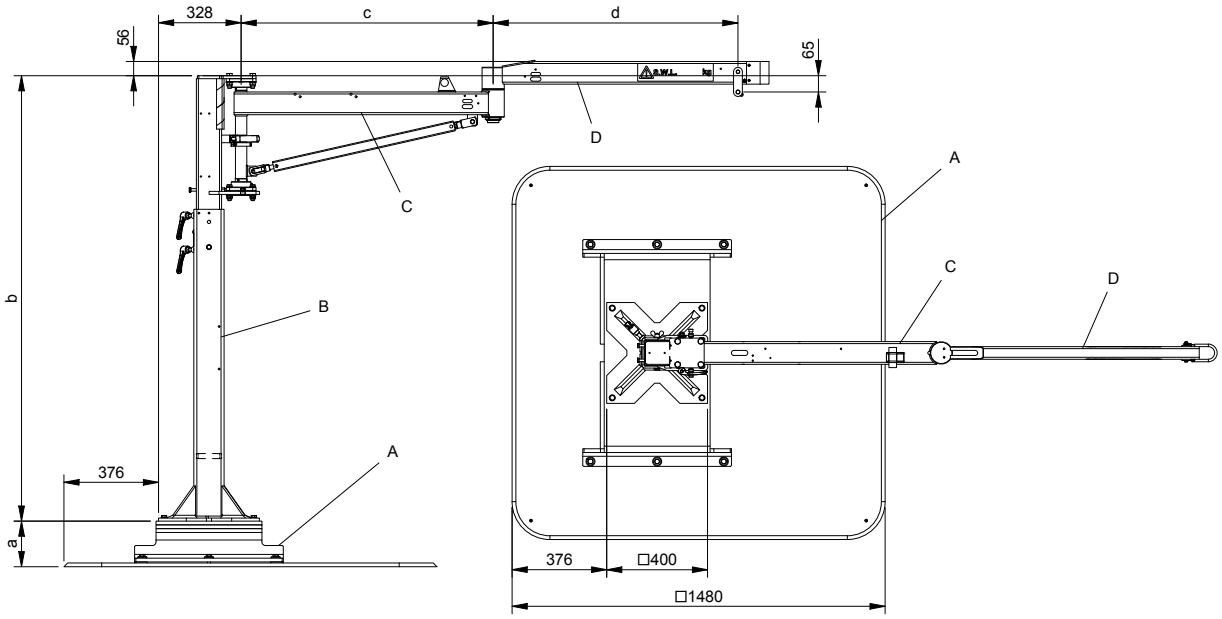
The inner and an outer arms can be locked relative to each other (optional).
The inner arm can also be locked to the tower (optional).

The shaft in the inner arm is attached to the tower with a bearing mount.
This shaft has an internal brake (optional) which works as a parking brake or a adjustable brake to prevent the inner arm from drifting.



1. *Fixed tower*
2. *Adjustable tower*
3. *Inner arm*
4. *Outer arm*
5. *Rotation limiter*
6. *Arm lock*
7. *Hanger lug*
8. *Footplate*
9. *Parking position brake*

3. Technical Data



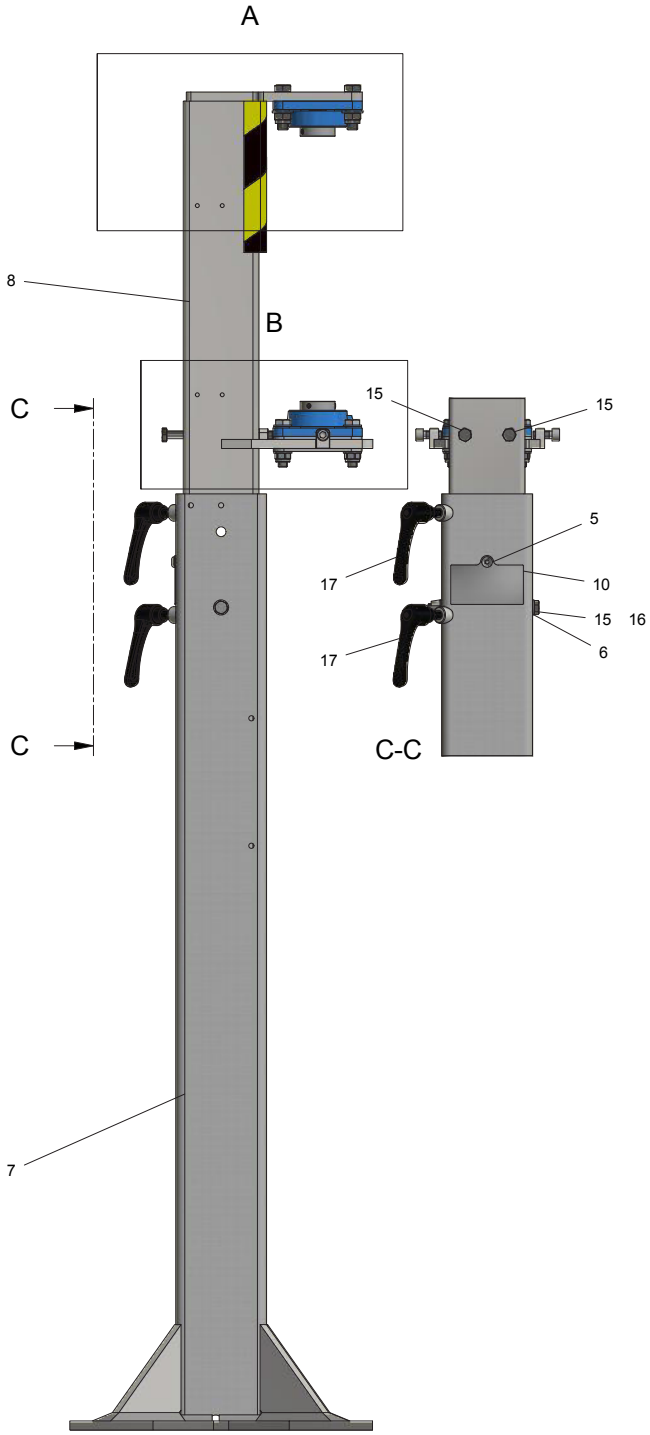
Dimensions and Weights	a [mm]	b [mm]	c [mm]	d [mm]	Weight [kg]
A - Mobile footplate 1	136				271
A - Mobile footplate 1	151				309
A - Mobile footplate 2	166				345
A - Mobile footplate 3	181				381
A - Mobile footplate 4	196				418
A - Mobile footplate 5	211				455
A - Mobile footplate 6	226				491
A - Mobile footplate 7	241				528
A - Mobile footplate 8	256				565
A - Mobile footplate 9	271				601
A - Mobile footplate 10	286				637
A - Mobile footplate 11	301				674
B - Fixed tower		Free Height			20+bx0.028
B - Adjustable tower		1768-2728[1]			83
B - Adjustable tower +500		2268-3228[1]			90
C - Inner arm 1			1000		24
C - Inner arm 1.5			1500		32
C - Inner arm 2			2000		38
D - Outer arm 1				970	17
D - Outer arm 1.5				1470	20
D - Outer arm 2				1970	24

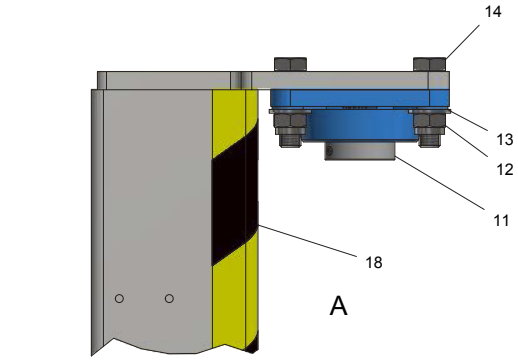
[1] The height of the tower may be adjusted within the stated intervals in increments of 100 mm

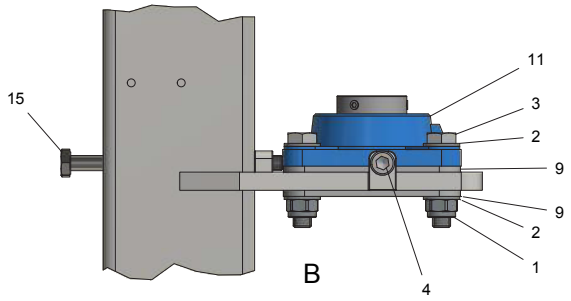
General		
Max. crane load	[kg]	50
Operating temperature	[° C]	5 - 40

4. Components

4.1 Adjustable tower

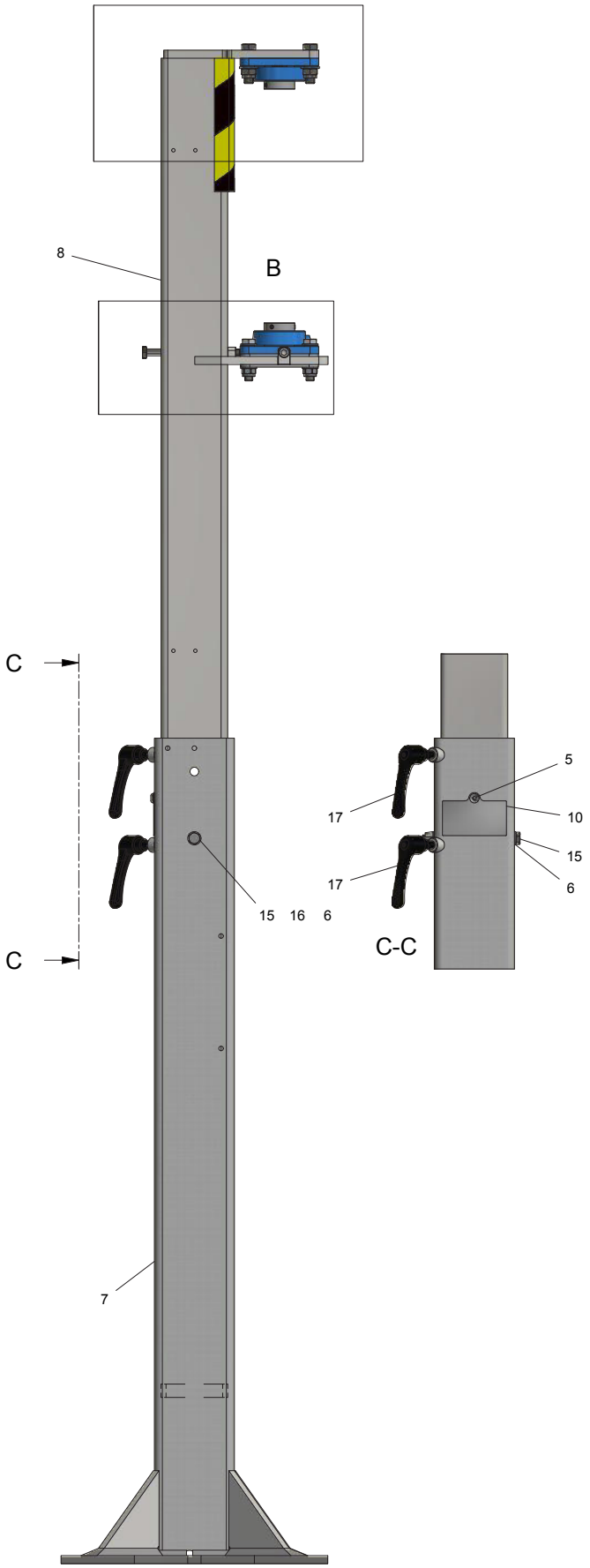


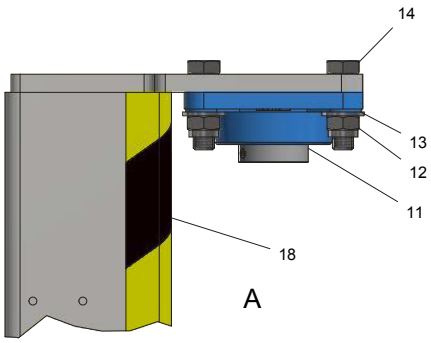


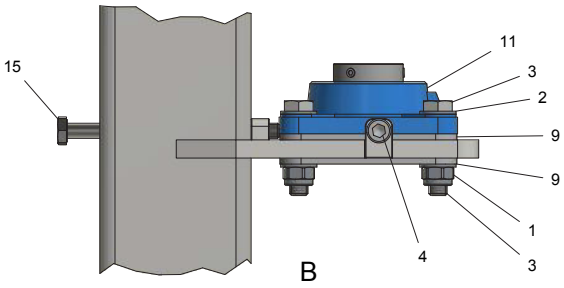


	743253	Adjustable tower		
#	Article nr.	Designation		Quantity
1	730243	Locking nut M12		4
2	730244	Washer BRB 13x24x2		8
3	732108	Screw M6S M12x55, half thread		4
4	733481	Screw MC6S M10x25		2
5	735326	Screw K6S M6x8 A2		1
6	737615	Washer BRB 10,5x20x2		2
7	743200	Lower tower-weld		1
8	743201	Upper tower-weld		1
9	743226	Adjustment plate		2
10	743249	Sign plate		1
11	743263	Bearing unit Ø35	S	2
12	743264	Locking nut M14		4
13	743265	Washer BRB 15x28x2,5		4
14	743266	Screw M6S M14x50, full thread		4
15	743267	Screw M6S M10x140, half thread		3
16	743268	Wing nut M10		1
17	743269	Adjustable hand lever M12x40	R	2
18	743417	Edge protection 30x30x10	S	2

4.2 Adjustable tower +500

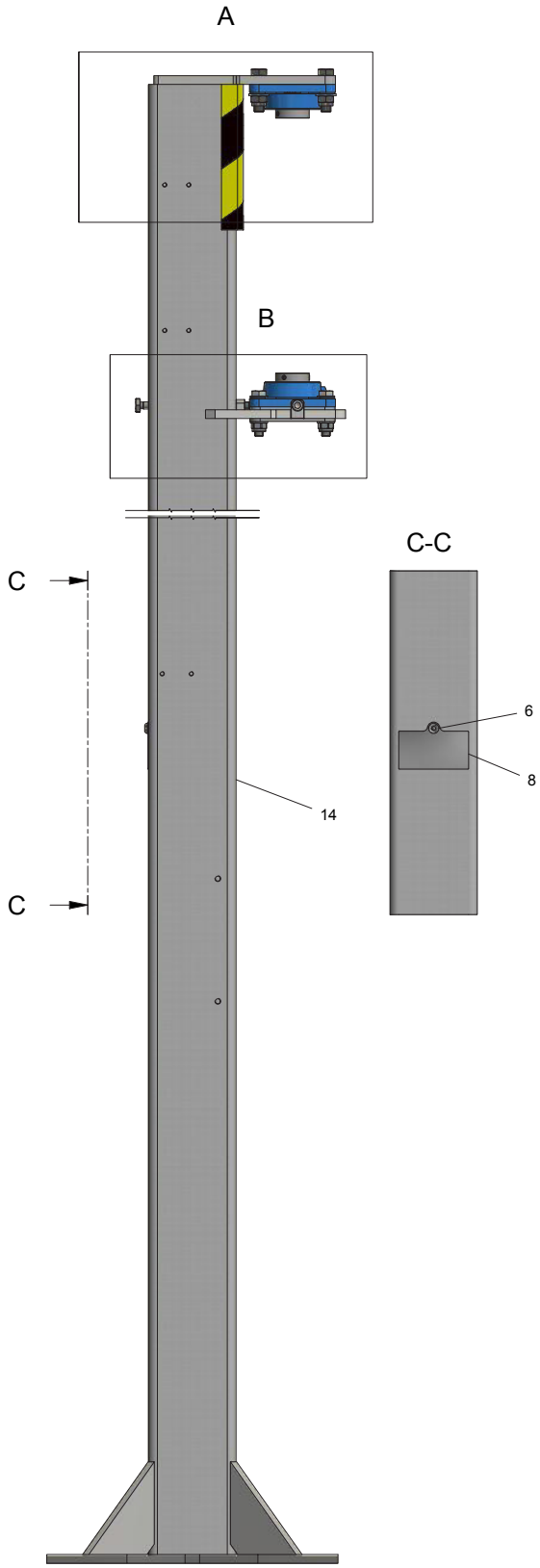


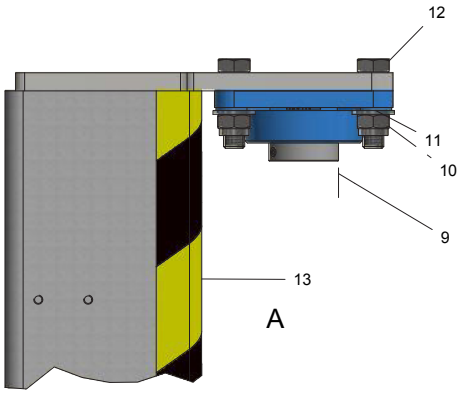


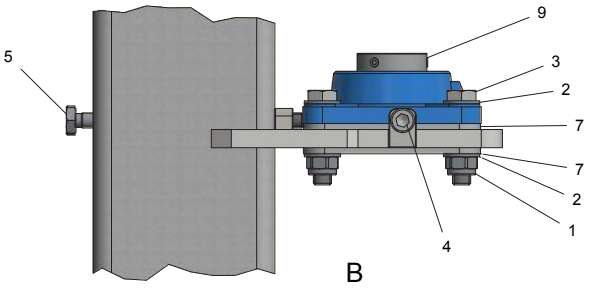


	743254	Adjustable tower +500		
#	Article nr.	Designation		Quantity
1	730243	Locking nut M12		4
2	730244	Washer BRB 13x24x2		8
3	732108	Screw M6S M12x55, half thread		4
4	733481	Screw MC6S M10x25		2
5	735326	Screw K6S M6x8 A2		1
6	737615	Washer BRB 10,5x20x2		2
7	743200	Lower tower-weld		1
8	743202	Upper tower +500 -weld		1
9	743226	Adjustment plate		2
10	743249	Sign plate		1
11	743263	Bearing unit Ø35	S	2
12	743264	Locking nut M14		4
13	743265	Washer BRB 15x28x2,5		4
14	743266	Screw M6S M14x50, full thread		4
15	743267	Screw M6S M10x140, half thread		3
16	743268	Wing nut M10		1
17	743269	Adjustable hand lever M12x40	R	2
18	743417	Edge protection 30x30x10	S	2

4.3 Fixed tower

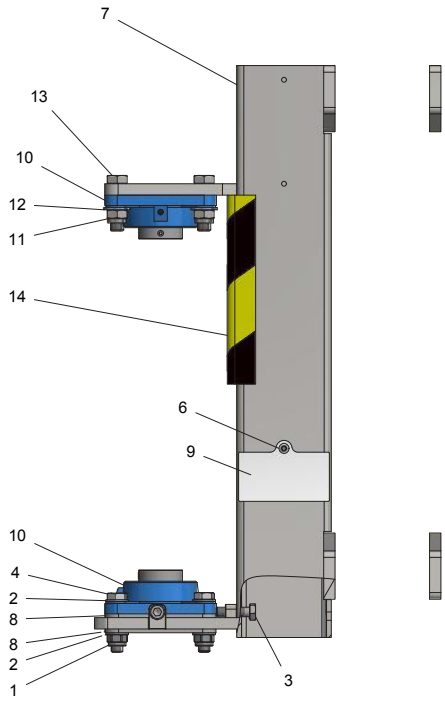


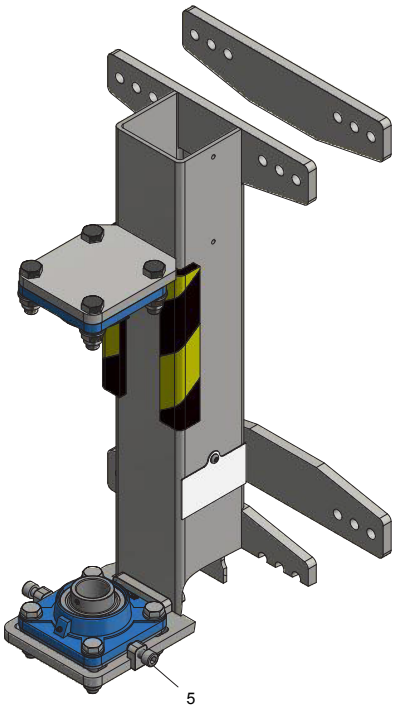




	743953	Tower, fixed height		
#	Article nr.	Designation		Quantity
1	730243	Locking nut M12		4
2	730244	Washer BRB 13x24x2		8
3	732108	Screw M6S M12x55, half thread		4
4	733481	Screw MC6S M10x25		2
5	733779	Screw M6S M10x150, half thread		2
6	735564	Screw K6S M8x10 A2		1
7	743226	Adjustment plate		2
8	743249	Sign plate		1
9	743263	Bearing unit Ø35	S	2
10	743264	Locking nut M14		4
11	743265	Washer BRB 15x28x2,5		4
12	743266	Screw M6S M14x50, full thread		4
13	743417	Edge protection 30x30x10	S	2
14	743954	Tower, fixed height-weld		1

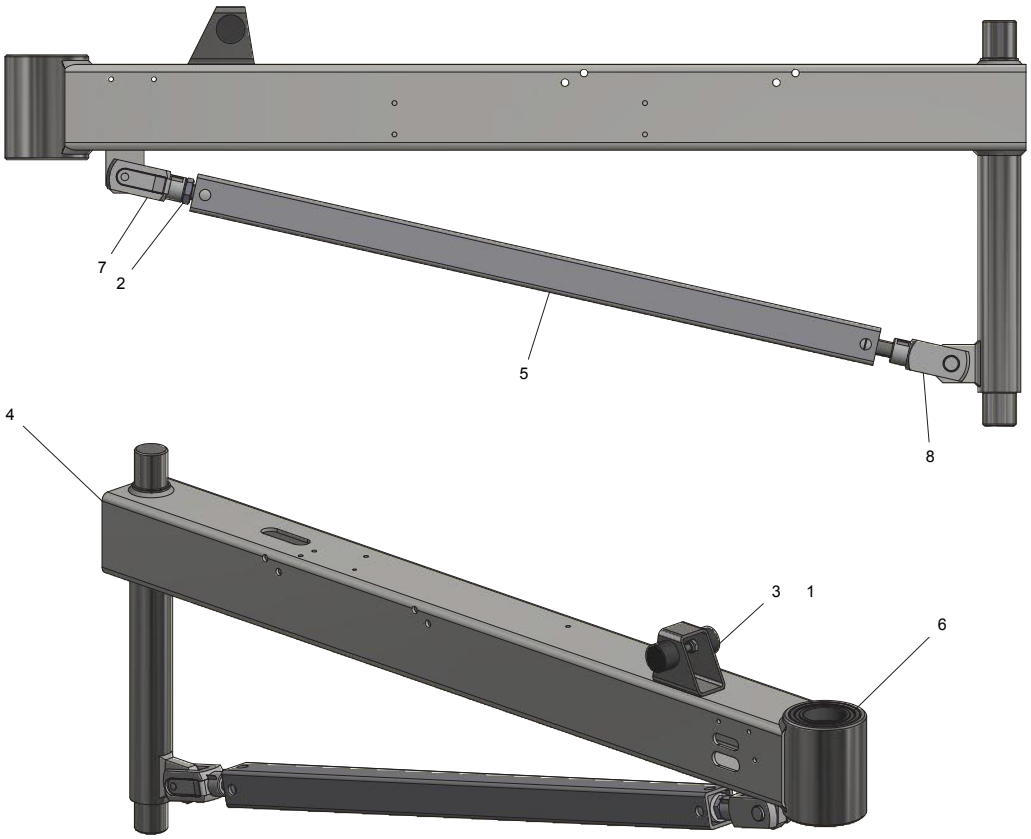
4.4 Wall bracket





	743255	Wall bracket		
#	Part no.	Designation		Quantity
1	730243	Lock nut M12		4
2	730244	Washer, 13x24x2		8
3	731326	Screw M6S M10x35, full thread		2
4	732108	Screw M6S M12x55, part threaded		4
5	733481	Screw MC6S M10x25		2
6	735326	Screw K6S M6x8 A2		1
7	743203	Wall bracket, welded		1
8	743226	Spacer		2
9	743249	Identification plate		1
10	743263	Bearing unit Ø35	S	2
11	743264	Lock nut M14		4
12	743265	Washer, 15x28x2.5		4
13	743266	Screw M6S M14x50, full thread		4
14	743417	End protector 30x30x10	S	2

4.5 Inner arm

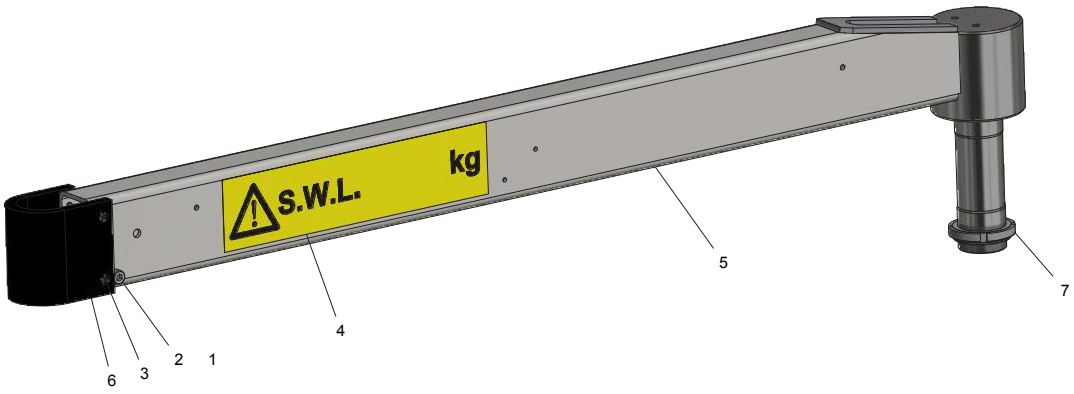


	743256	Inner arm 1m		
#	Part no.	Designation		Quantity
1	730117	Lock nut M8		2
2	730237	Nut ML6M M16		1
3	730449	Rubber bumper		2
4	743204	Inner arm 1m, welded		1
5	743207	Lower support, 1m		1
6	743270	Ball bearing	S	2
7	743271	Forked link M16, RH thread		1
8	743272	Forked link M16, LH thread		1

	743257	Inner arm 1.5m		
#	Part no.	Designation		Quantity
1	730117	Lock nut M8		2
2	730237	Nut ML6M M16		1
3	730449	Rubber bumper		2
4	743205	Inner arm 1.5m welded		1
5	743208	Lower support, 1.5-2m		1
6	743270	Ball bearing	S	2
7	743271	Forked link M16, RH thread		1
8	743272	Forked link M16, LH thread		1

	743258	Inner arm 2m		
#	Part no.	Designation		Quantity
1	730117	Lock nut M8		2
2	730237	Nut ML6M M16		1
3	730449	Rubber bumper		2
4	743206	Inner arm 2m welded		1
5	743208	Lower support, 1.5-2m		1
6	743270	Ball bearing	S	2
7	743271	Forked link M16, RH thread		1
8	743272	Forked link M16, LH thread		1

4.6 Outer arm

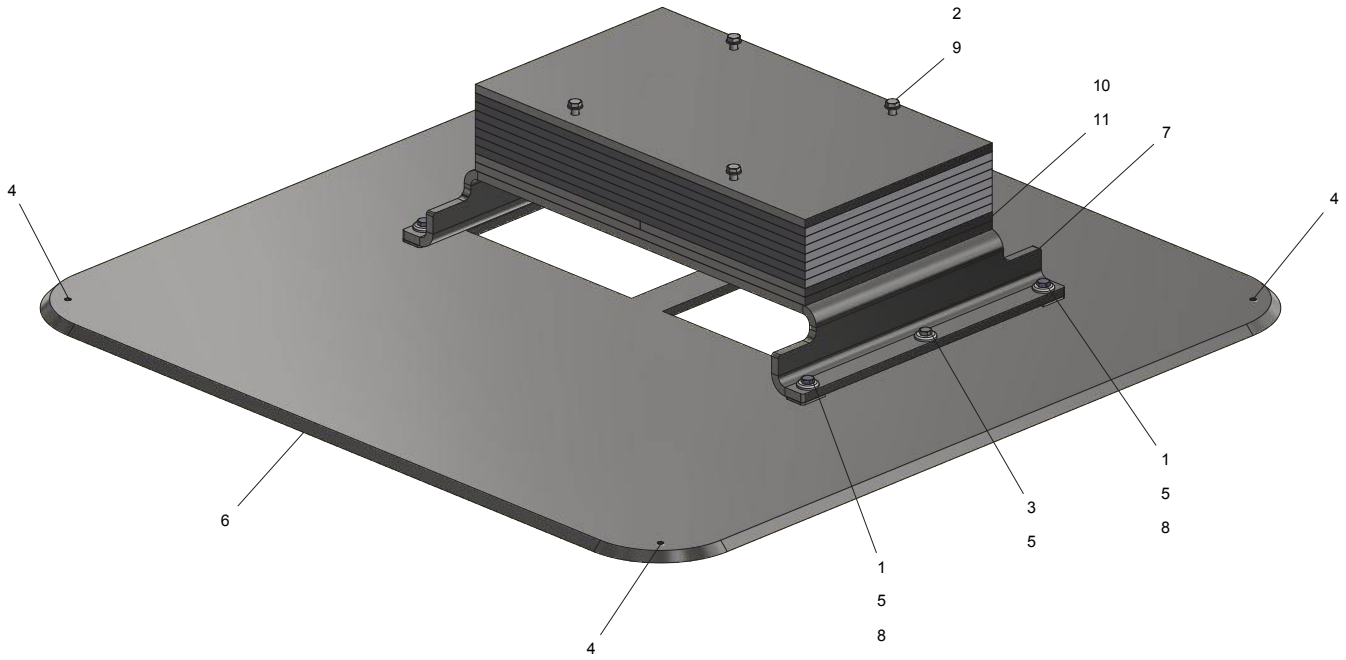


	743259	Outer arm 1m	
#	Part no.	Designation	Quantity
1	730117	Lock nut M8	1
2	731831	Screw MC6S M8x60	1
3	732437	Screw MF6S M5x16	4
4	737007	Decal, Max. load (open)	2
5	743209	Outer arm , 1m welded	1
6	743273	Rubber protection	1
7	743274	Shaft nut KM 09 GUK	1

	743260	Outer arm 1.5m	
#	Part no.	Designation	Quantity
1	730117	Lock nut M8	1
2	731831	Screw MC6S M8x60	1
3	732437	Screw MF6S M5x16	4
4	737007	Decal, Max. load (open)	2
5	743210	Outer arm , 1.5m welded	1
6	743273	Rubber protection	1
7	743274	Shaft nut KM 09 GUK	1

	743261	Outer arm 2m	
#	Part no.	Designation	Quantity
1	730117	Lock nut M8	1
2	731831	Screw MC6S M8x60	1
3	732437	Screw MF6S M5x16	4
4	737007	Decal, Max. load (open)	2
5	743211	Outer arm , 2m welded	1
6	743273	Rubber protection	1
7	743274	Shaft nut KM 09 GUK	1

4.7 Mobile footplate



	743509	Mobile footplate 0	
#	Part no.	Designation	Quantity
1	730227	Screw M6S M12x40, full thread	4
2	730244	Washer, 13x24x2	4
3	732109	Screw M6S M12x35, full thread	2
4	735556	Screw MSK6SS M12x16	4
5	738115	Washer 13x36x6	6
6	743212	Footplate	1
7	743213	U-profile	1
8	743247	Spacer	4
9	730255	Screw M6S M12x30, full thread	4

	743429	Mobile footplate 2	
#	Part no.	Designation	Quantity
1	730227	Screw M6S M12x40, full thread	4
2	730244	Washer, 13x24x2	4
3	732109	Screw M6S M12x35, full thread	2
4	735556	Screw MSK6SS M12x16	4
5	738115	Washer 13x36x6	6
6	743212	Footplate	1
7	743213	U-profile	1
8	743247	Spacer	4
9	730779	Screw M12x60, part threaded	4
10	743214	Weight 1	1
11	743215	Weight 2	2

	743510	Mobile footplate 1	
#	Part no.	Designation	Quantity
1	730227	Screw M6S M12x40, full thread	4
2	730244	Washer, 13x24x2	4
3	732109	Screw M6S M12x35, full thread	2
4	735556	Screw MSK6SS M12x16	4
5	738115	Washer 13x36x6	6
6	743212	Footplate	1
7	743213	U-profile	1
8	743247	Spacer	4
9	740678	Screw M6S M12x45	4
10	743214	Weight 1	1

	742425	Mobile footplate 3	
#	Part no.	Designation	Quantity
1	730227	Screw M6S M12x40, full thread	4
2	730244	Washer, 13x24x2	4
3	732109	Screw M6S M12x35, full thread	2
4	735556	Screw MSK6SS M12x16	4
5	738115	Washer 13x36x6	6
6	743212	Footplate	1
7	743213	U-profile	1
8	743247	Spacer	4
9	743248	Screw M12x75, part threaded	4
10	743214	Weight 1	2
11	743215	Weight 2	2

	743250	Mobile footplate 4	
#	Part no.	Designation	Quantity
1	730227	Screw M6S M12x40, full thread	4
2	730244	Washer, 13x24x2	4
3	735529	Screw M12x90, part threaded	4
4	735556	Screw MSK6SS M12x16	4
5	738115	Washer 13x36x6	6
6	743212	Footplate	1
7	743213	U-profile	1
8	743247	Spacer	4
9	732109	Screw M6S M12x35, full thread	2
10	743214	Weight 1	3
11	743215	Weight 2	2

	743251	Mobile footplate 5	
#	Part no.	Designation	Quantity
1	730227	Screw M6S M12x40, full thread	4
2	730244	Washer, 13x24x2	4
3	732109	Screw M6S M12x35, full thread	2
4	735556	Screw MSK6SS M12x16	4
5	738115	Washer 13x36x6	10
6	743212	Footplate	1
7	743213	U-profile	1
8	743247	Spacer	4
9	735531	Screw M6S M12x110, part threaded	4
10	743214	Weight 1	4
11	743215	Weight 2	2

	743252	Mobile footplate 6	
#	Part no.	Designation	Quantity
1	730227	Screw M6S M12x40, full thread	4
2	730244	Washer, 13x24x2	4
3	732109	Screw M6S M12x35, full thread	2
4	735556	Screw MSK6SS M12x16	4
5	738115	Washer 13x36x6	6
6	743212	Footplate	1
7	743213	U-profile	1
8	743247	Spacer	4
9	735532	Screw M12x120, part threaded	4
10	743214	Weight 1	5
11	743215	Weight 2	2

	743418	Mobile footplate 7	
#	Part no.	Designation	Quantity
1	730227	Screw M6S M12x40, full thread	4
2	730244	Washer, 13x24x2	4
3	732109	Screw M6S M12x35, full thread	2
4	735556	Screw MSK6SS M12x16	4
5	738115	Washer 13x36x6	10
6	743212	Footplate	1
7	743213	U-profile	1
8	743247	Spacer	4
9	743419	Screw M12x140, part threaded	4
10	743214	Weight 1	6
11	743215	Weight 2	2

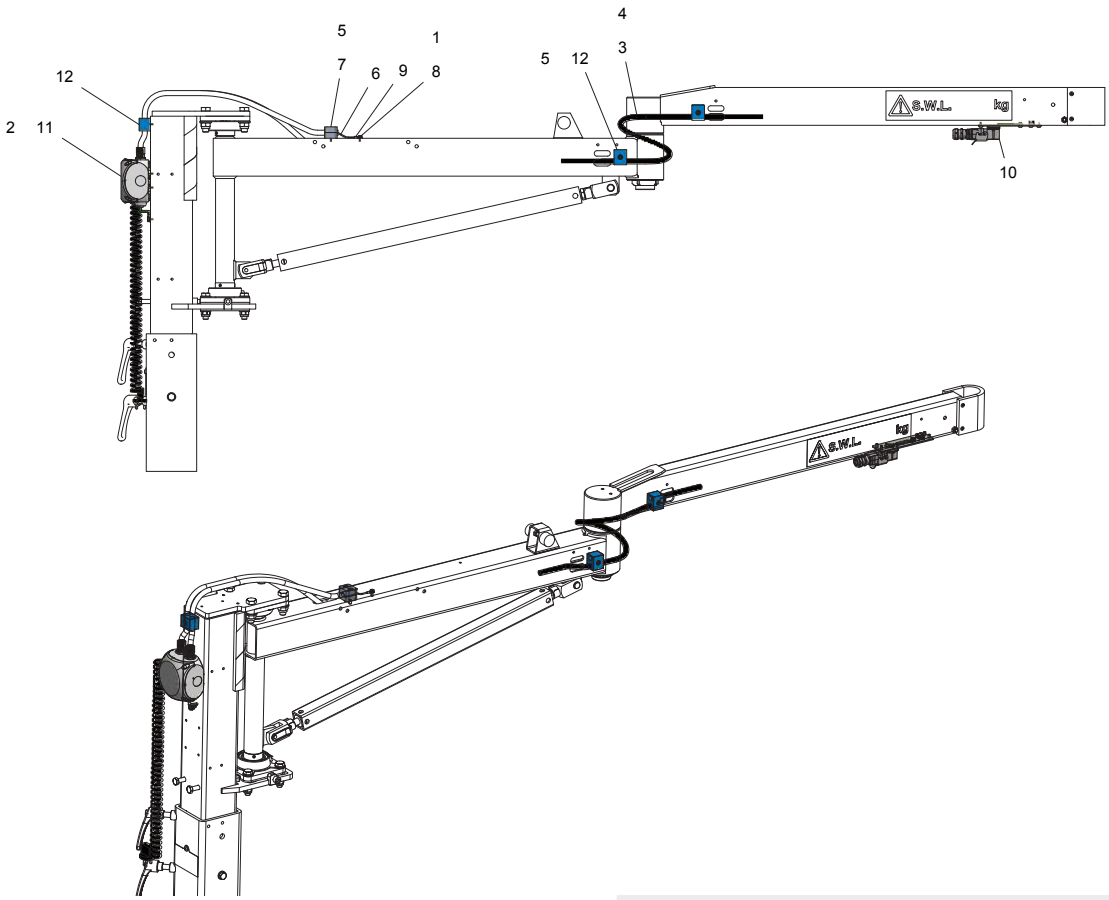
	743428	Mobile footplate 8	
#	Part no.	Designation	Quantity
1	730227	Screw M6S M12x40, full thread	4
2	730244	Washer, 13x24x2	4
3	732109	Screw M6S M12x35, full thread	2
4	735556	Screw MSK6SS M12x16	4
5	738115	Washer 13x36x6	6
6	743212	Footplate	1
7	743213	U-profile	1
8	743247	Spacer	4
9	740003	Screw M6S M12x150, part threaded	4
10	743214	Weight 1	7
11	743215	Weight 2	2

	743535	Mobile footplate 9	
#	Part no.	Designation	Quantity
1	730227	Screw M6S M12x40, full thread	4
2	730244	Washer, 13x24x2	4
3	732109	Screw M6S M12x35, full thread	2
4	735556	Screw MSK6SS M12x16	4
5	738115	Washer 13x36x6	10
6	743212	Footplate	1
7	743213	U-profile	1
8	743247	Spacer	4
9	743537	Screw M6S M12x170, part threaded	4
10	743214	Weight 1	8
11	743215	Weight 2	2

	743562	Mobile footplate 10	
#	Part no.	Designation	Quantity
1	730227	Screw M6S M12x40, full thread	4
2	730244	Washer, 13x24x2	4
3	732109	Screw M6S M12x35, full thread	2
4	735556	Screw MSK6SS M12x16	4
5	738115	Washer 13x36x6	6
6	743212	Footplate	1
7	743213	U-profile	1
8	743247	Spacer	4
9	733769	Screw M6S M12x180, part threaded	4
10	743214	Weight 1	9
11	743215	Weight 2	2

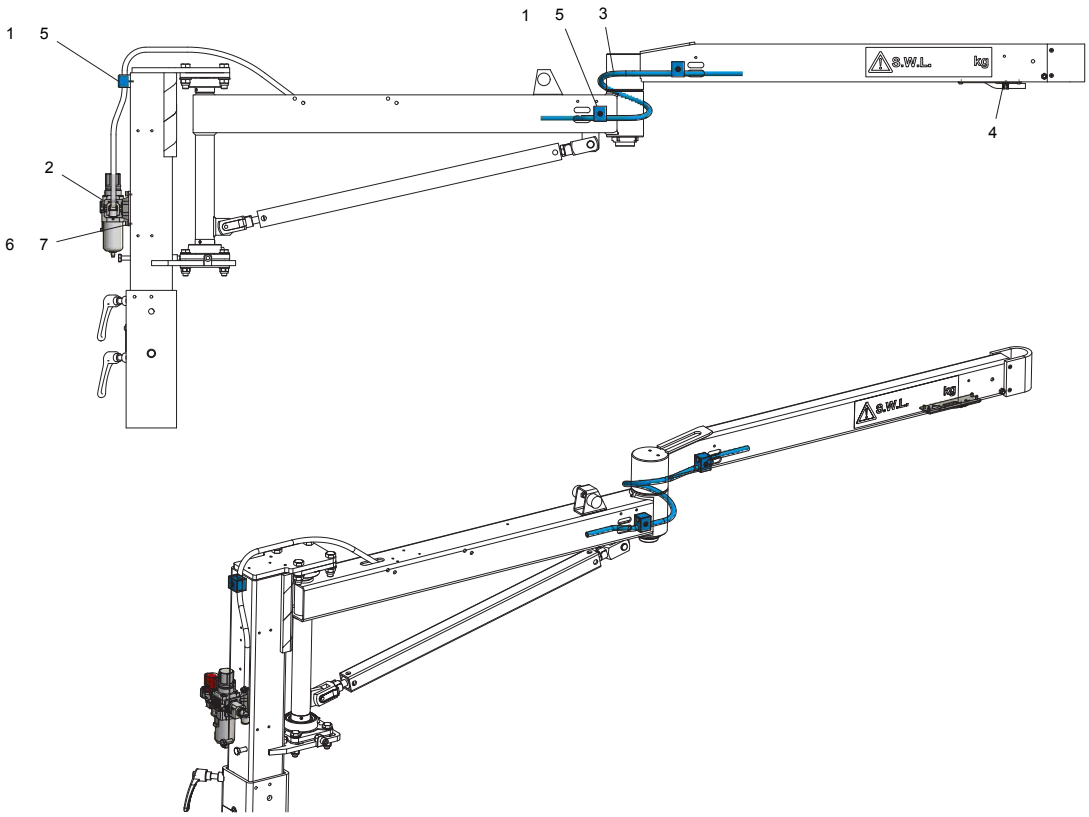
	743563	Mobile footplate 11	
#	Part no.	Designation	Quantity
1	730227	Screw M6S M12x40, full thread	4
2	730244	Washer, 13x24x2	4
3	732109	Screw M6S M12x35, full thread	2
4	735556	Screw MSK6SS M12x16	4
5	738115	Washer 13x36x6	10
6	743212	Footplate	1
7	743213	U-profile	1
8	743247	Spacer	4
9	743564	Screw M6S M12x200, part threaded	4
10	743214	Weight 1	10
11	743215	Weight 2	2

4.8 Power supply - Electric supply 230V



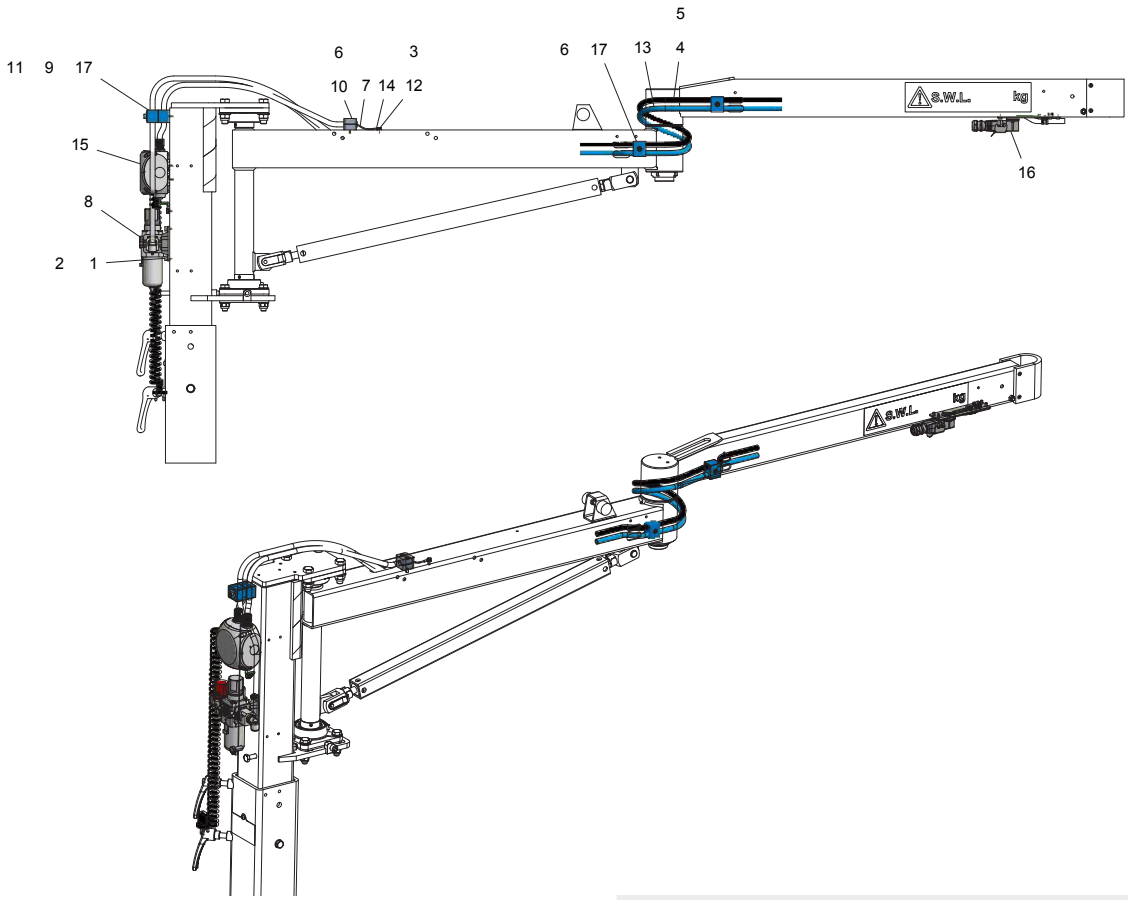
	743924	Electric supply 230V	
#	Part no.	Designation	Quantity
1	730307	Washer, 5.3x10x1	1
2	730958	Wiring tube	2
3	730958	Wiring tube	1
4	732814	Wire 3G1.5 Classic 810	1
5	733691	Screw MC6S M6x30	5
6	733992	Cable	1
7	739978	Hose clamp Ø12, two-part	1
8	740671	Screw M6S M5x16, full thread	1
9	743923	Cable lug	1
10	743933	Electric interface, MobiArm	1
11	743934	Connection box, Mobiarm	1
12	743932	Pipe bracket	3

4.9 Power supply - Pneumatics Ø12



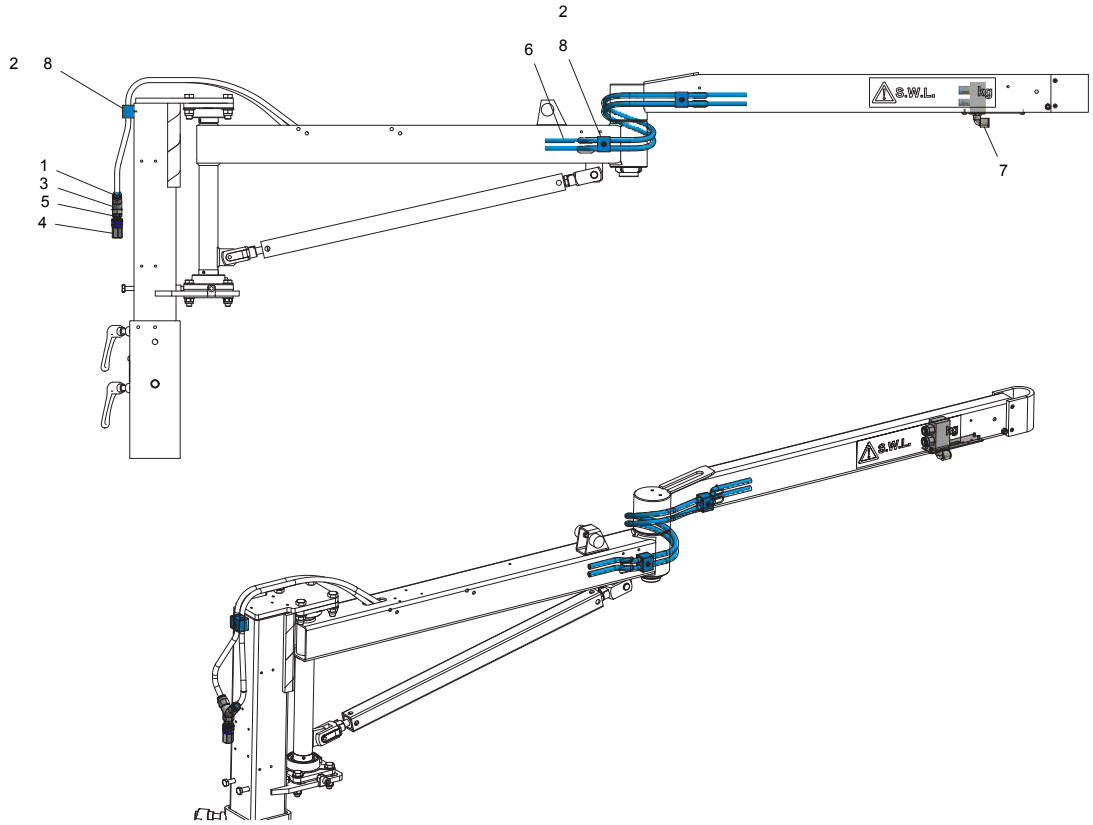
	743925	Pneumatic connector Ø12	
#	Part no.	Designation	Quantity
1	733691	Screw MC6S M6x30	3
2	735349	FRL unit (A)	1
3	743104	Hose Ø12x8	1
4	743940	Pneumatic connection, MobiArm	1
5	743932	Pipe bracket	3
6	730268	Washer, 6.4x12x1.5	4
7	730249	Screw MC6S M6x12	4

4.10 Power supply - Electric supply 230V + Pneumatics Ø12



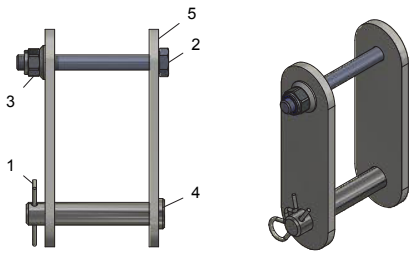
	743926	Electro-pneumatic connection	
#	Part no.	Designation	Quantity
1	730249	Screw MC6S M6x12	4
2	730268	Washer, 6.4x12x1.5	4
3	730307	Washer, 5.3x10x1	1
4	730958	Wiring tube	1
5	732814	Wire 3G1.5 Classic 810	1
6	733691	Screw MC6S M6x30	4
7	733992	Cable	1
8	735349	FRL unit (A)	1
9	739784	Flat washer, SRKB 7x22x1.5	1
10	739978	Hose clamp Ø12, two-part	1
11	740661	Screw MC6S M6x65	1
12	740671	Screw M6S M5x16, full thread	1
13	743104	Hose Ø12x8	1
14	743923	Cable lug	1
15	743934	Connection box, Mobiarm	1
16	743942	Electro-pneumatic connection	1
17	743932	Pipe bracket	4

4.11 Power supply - Pneumatics 2x Ø12

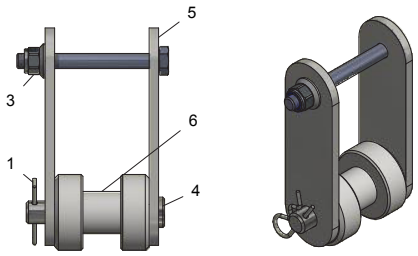


	743927	Pneumatic connection 2x Ø12	
#	Part no.	Designation	Quantity
1	732853	Straight coupling, G3/8"-12	2
2	733691	Screw MC6S M6x30	3
3	739213	Y-connector G3/8"	1
4	739317	Quick release coupling, female 3/8	1
5	739319	Quick release coupling, male 3/8	1
6	743104	Hose Ø12x8	2
7	743943	Pneumatic connection	1
8	743932	Pipe bracket	3

4.12 Hanger lug

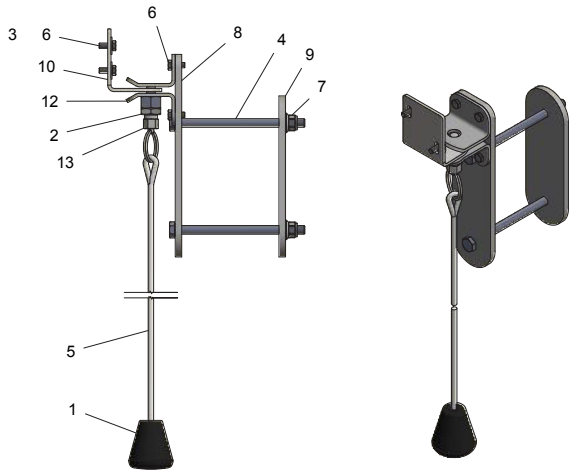


	743928	Suspension lug, universal	
#	Part no.	Designation	Quantity
1	730209	Split pin	1
2	732342	Screw M6S M8x70, part threaded	1
3	741071	Nut M6MF M8 Nyloc	1
4	743424	Pin	1
5	743951	Suspension plate	2



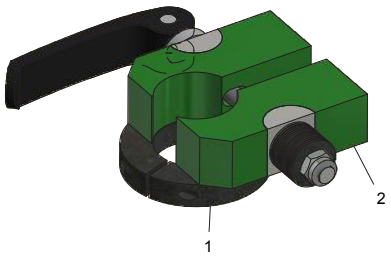
	743929	Suspension lug, GMC	
#	Part no.	Designation	Quantity
1	730209	Split pin	1
2	732342	Screw M6S M8x70, part threaded	1
3	741071	Nut M6MF M8 Nyloc	1
4	743424	Pin	1
5	743951	Suspension plate	2
6	743952	Adapter	1

4.13 Hanger lug



	743931	Arm lock	
#	Part no.	Designation	Quantity
1	6070049	Conical knob	1
2	730222	Thin nut M12	1
3	730782	Rivet washer 5x16x1	2
4	731324	Screw M6S M8x120, part threaded	2
5	731609	Cord D=5	1
6	740671	Screw M6S M5x16, full thread	6
7	741071	Nut M6MF M8 Nyloc	2
8	743945	Clamping plate 1	1
9	743946	Clamping plate 2	1
10	743947	Arm mount	1
11	743948	Upper guide	1
12	743949	Lower guide	1
13	743958	Bolt, adjustment	1

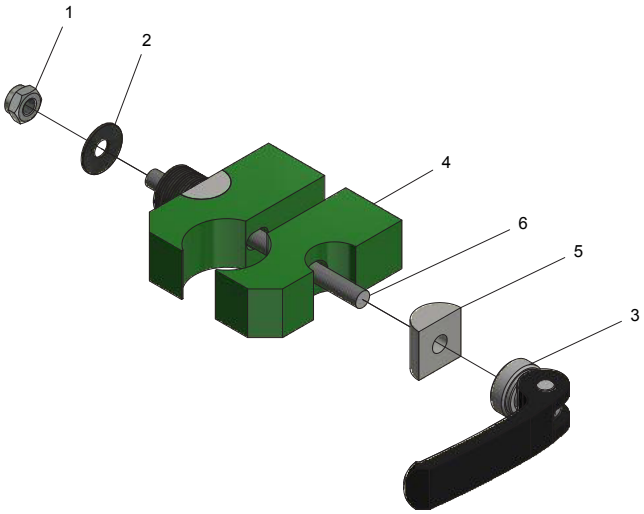
4.14 Parking brake - inner



	743930	Inner brake, assembly	
#	Part no.	Designation	Quantity
1	743277	Clamping ring Ø45	1
2	743460	Inner brake	1

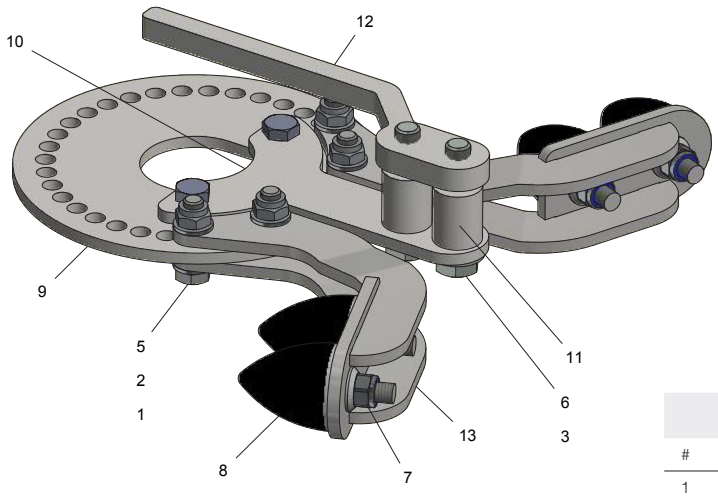
* See below for details

Inner brake



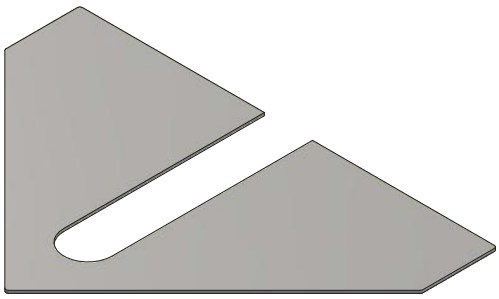
	743460	Inner brake		
#	Part no.	Designation		Quantity
1	730904	Lock nut M10		1
2	743279	Disc spring Ø28x10.2x1.5		12
3	743416	Eccentric tensioner M10	R	1
4	743461	Brake pad	S	2
5	743462	Thrust washer		2
6	731793	Threaded rod M10		1

4.16 Rotation limiter



	743974	Rotation limiter	
#	Part no.	Designation	Quantity
1	730117	Lock nut M8	4
2	730308	Washer, 8.4x16x1.5	8
3	730549	Washer, 10,5x22x2	2
4	731319	Screw M6S M8x25, full thread	2
5	731348	Screw M6S M8x30, full thread	4
6	733372	Screw M6S M10x50, full thread	2
7	741071	Nut M6MF M8 Nyloc	6
8	743150	Rubber bumper	4
9	743979	Indexing plate	1
10	743980	Bracket	1
11	743981	Spacer	2
12	743982	Captive nut plate	1
13	743985	Limiter arm	2

4.17 Various



	743506		
#	Part no.	Designation	Quantity
1	743506	Shim	1

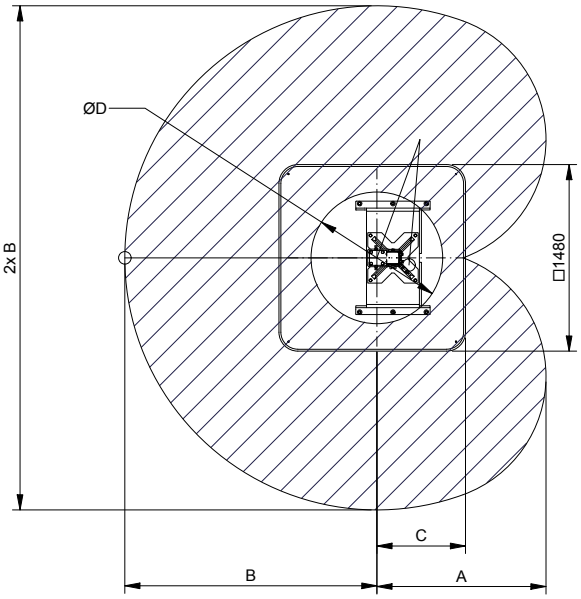
5. Installation

5.1 Preparations

NB: Carefully read chapter 2 on safety before starting installation of the crane.

Before you install the crane, you must check whether:
- it will intrude into truck paths or into the working area of any other equipment,
- there is a risk of physical interference with fixtures and such,
- there is a risk of getting caught in any item in the surrounding area.

In any such case, measures must be taken to avoid that personnel are hurt or equipment is damaged. The manufacturer is not responsible for where and how the crane is placed at the user's premises.



Crane working area

Inner and outer arms combined	A	B	C	D1
Inner arm 1 - Outer arm 1	*1345*	*1970*	*703*	*Ø855*
Inner arm 1 - Outer arm 1.5	*1845*	*2470*		*Ø1410*
Inner arm 1.5 - Outer arm 1.5	*1980*	*2970*		*Ø780*
Inner arm 1.5 - Outer arm 2.0	*2485*	*3470*		*Ø1300*
Inner arm 2 - Outer arm 2.0	*2720*	*3970*		*Ø700*

5.2 Permanently mounted crane

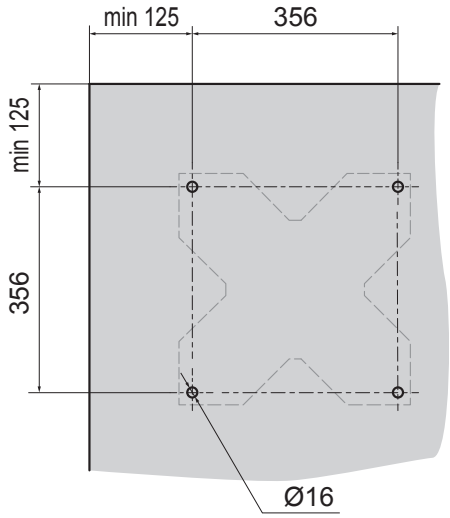
This version is supplied as two parts:
- tower
- inner and outer arms

Installing to floor

The crane is mounted in the floor using four expander bolts (part no. 743573 HST3 M16x135). The floor must be of concrete and be of **C20/25** quality, with a minimum thickness of **140 mm**.

Place the tower in position on the floor.

Use the floor plate of the tower as a template to drill four holes, **Ø16 mm** to a depth of **108 mm** (see image).
NB! The minimum distance to the nearest concrete edge must be **125 mm.**



Blow out any dust from the drilled holes with compressed air or such.

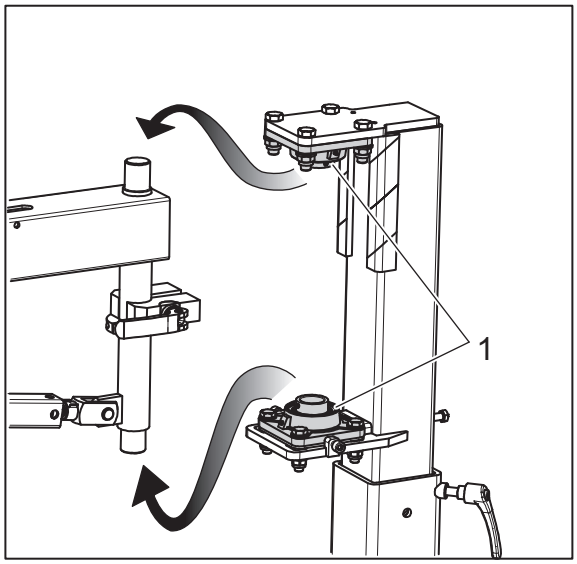
Insert an expander bolt through the foot plate into each hole. Tap the bolt in place with a hammer.
NB! Tap the rod of the expander bolt, not on the nut!
Tap the expander bolt so far down that the washer and the nut of the expander bolt are touching the foot plate of the tower.
The expander bolt must not touch the bottom of the drilled hole.

Use the included shims to plumb the tower..

Tighten the expander bolts to **110 Nm**.

Fitting the inner arm to the tower

Remove the flange bearings (1) already fitted to the tower. Place these on the inner arm shaft.

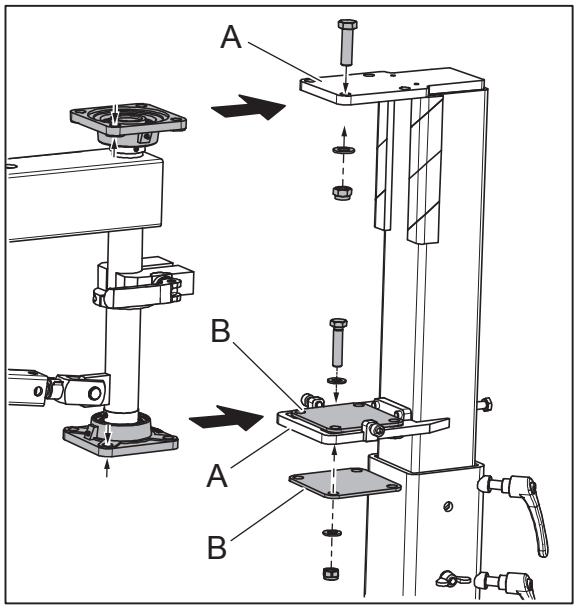


1 *Flange bearing*

Push the arm and bearings in between the bearing plates (A) on the tower. Insert a spacer (B) between the lower flange bearing and the bearing plate.

Refit screws, washers and nuts (Upper bearing M14, lower bearing M12). Fit a spacer under the lower bearing plate before fitting washers and nuts (M12).

Next, adjust the crane, go to “5.6 Adjusting the arm” on page 26.



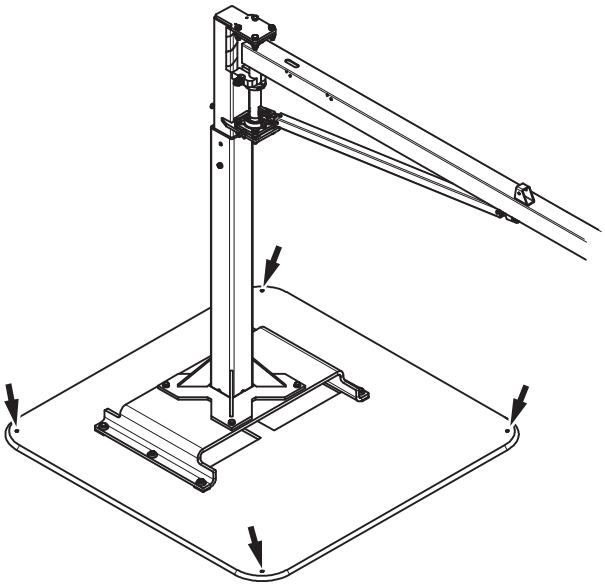
A *Bearing plate*
B *Spacer*

5.3 Crane with mobile foot plate and adjustable tower

The crane is delivered assembled.

Place the crane in position on the floor.

Adjust the levelling screws at the corners of the mobile foot plate so that these touch the floor and the crane is standing securely.



5.4 Crane with mobile foot plate and fixed tower

This version is delivered in three parts:

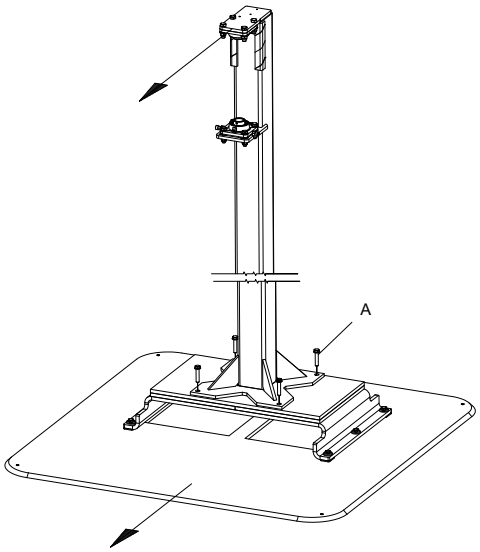
- mobile foot plate
- fixed tower
- inner and outer arms

Assembling the tower to the mobile foot plate

Place the foot plate on the floor and remove the screws (A)

Place the tower on the foot plate, and make sure that the tower and the foot plate are facing as per the illustration. Refit the screws. Tightening torque: 81Nm

Refit the inner arm according to ”Fitting the inner arm to the tower” on page 24.



5.5 Wall-mounted crane

The crane is delivered assembled:

For the installation, you will need:

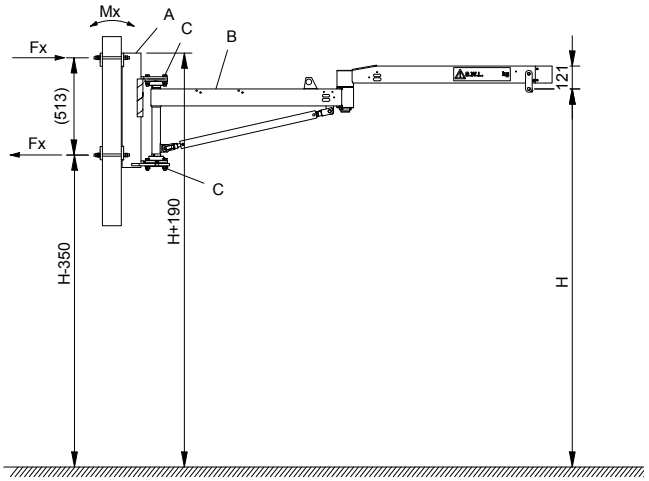
- 16 pcs Nut M12, grade 8.8
- 4 each 8.8 threaded rod M12
  Length = thickness of wall/pillar + 90mm

Mounting the crane to a wall

Remove the wall bracket (A) from the inner arm (B) by undoing screws (C) holding the flanged bearings
Mount the wall bracket at a suitable height and use a spirit level to adjust the position

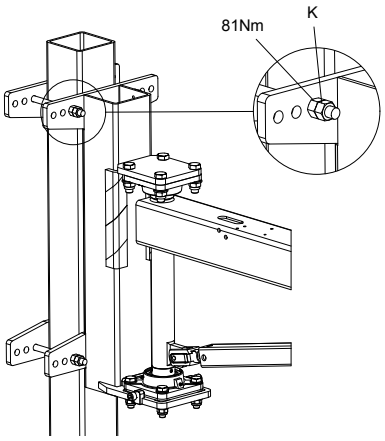
Tighten the nuts to the wall bracket to 81Nm
Secure each nut with an additional nut (K)

Refit the inner arm according to ”Fitting the inner arm to the tower” on page 24.



The crane loading on the pillar/wall

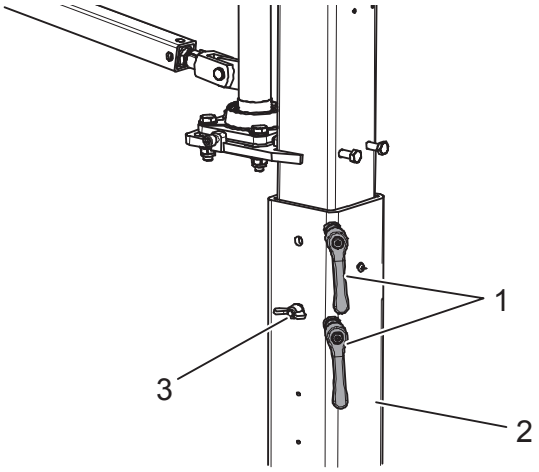
Inner and outer arms combined	Weight (kg)	Max. load (kg)	Mx (Nm)	Fx (N)
Inner arm 1 - Outer arm 1	*60*	*125*	*3425*	*6676*
Inner arm 1 - Outer arm 1.5	*65*	*90*	*3225*	*6286*
Inner arm 1.5 - Outer arm 1.5	*73*	*95*	*3804*	*7415*
Inner arm 1.5 - Outer arm 2.0	*77*	*65*	*3606*	*7028*
Inner arm 2 - Outer arm 2.0	*82*	*50*	*3486*	*6796*



5.6 Adjusting the arm

When the arm is adjusted, the lifting equipment must be attached but no load is to be carried (empty).

Commence by setting the crane height.
Undo the tension screws (1), remove the wing nut (3), and remove the screw.
Lift the upper half of the tower to the desired height.
NB! The upper part of the tower must not be lifted so high that the red marks are visible.
Refit the screw and the wing nut.
Tighten the tension screws.



1. *Tensioning screws*
2. *Tower*
3. *Wing nut and screw*

Move the arm (inner and outer sections) to 90° compared to the normal position (B), as per the image.

Place a spirit-level on top of the inner arm. Observe the spirit-level.

Move the arm 180° to a position exactly opposite (C), as per the image

Place the spirit-level on top of the inner arm in the same way as before. Observe the spirit-level.

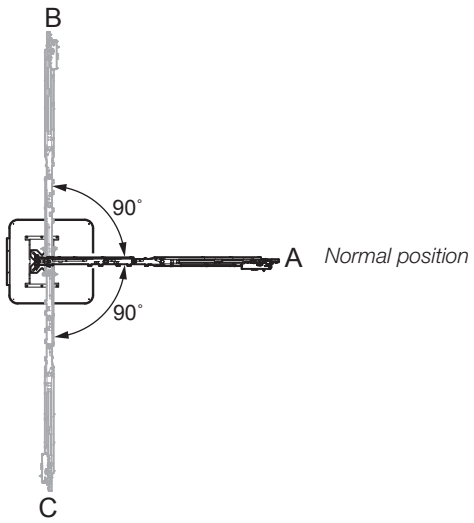
Undo the screws holding the lower flange bearing somewhat and adjust sideways using the adjusting screws (see image) until the spirit level shows the same for both positions (B and C).

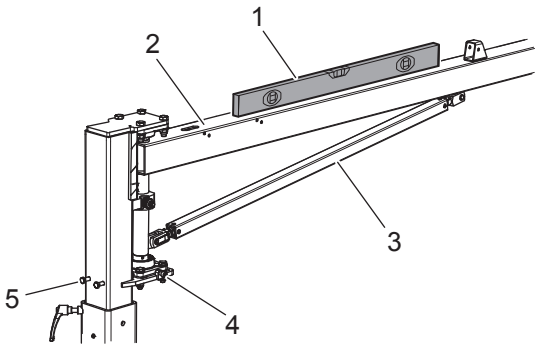
Turn the arm to position C. Adjust the lower support to the inner arm so that the arm is perfectly level.

Turn the arm to position B. Check that the arm is still perfectly level.

Turn the arm to position A (normal position). Adjust the lower bearing using the adjusting screw for lateral adjustment (see image) to level the inner arm.

Tighten the screws that hold the inner bearing of the inner arm when the arm is correctly adjusted as per above.





1. *Spirit level*
2. *Inner arm*
3. *Lower support to inner arm*
4. *Lateral adjusting screw*
5. *Longitudinal adjusting screw*

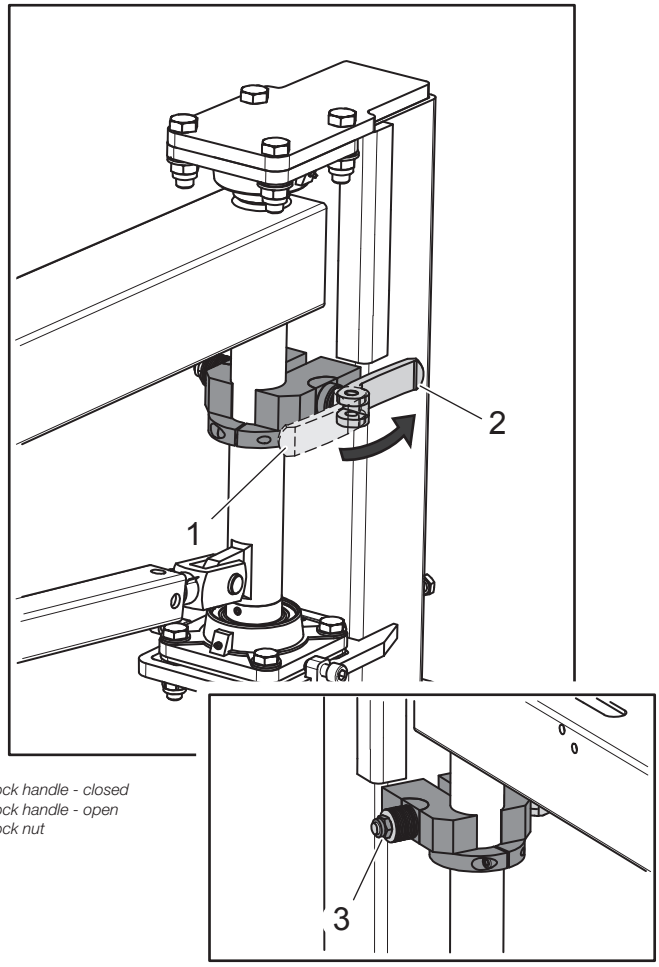
5.7 Adjusting the inner brake (option)

The inner brake (see image) is adjusted so that the crane arm does not turn.

Set the lock handle of the inner brake in the open position.

Adjust the brake by tightening or releasing the lock nut (see image).

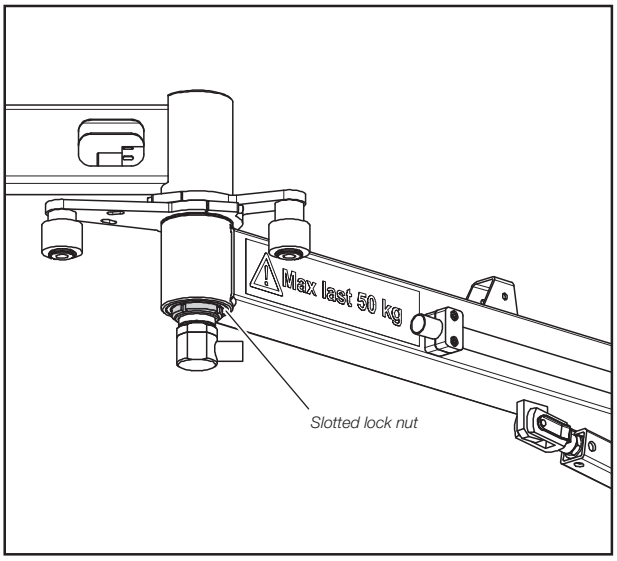
(The parked position of the inner brake (locked position) is described at “Parking position, crane arms” on page 29).



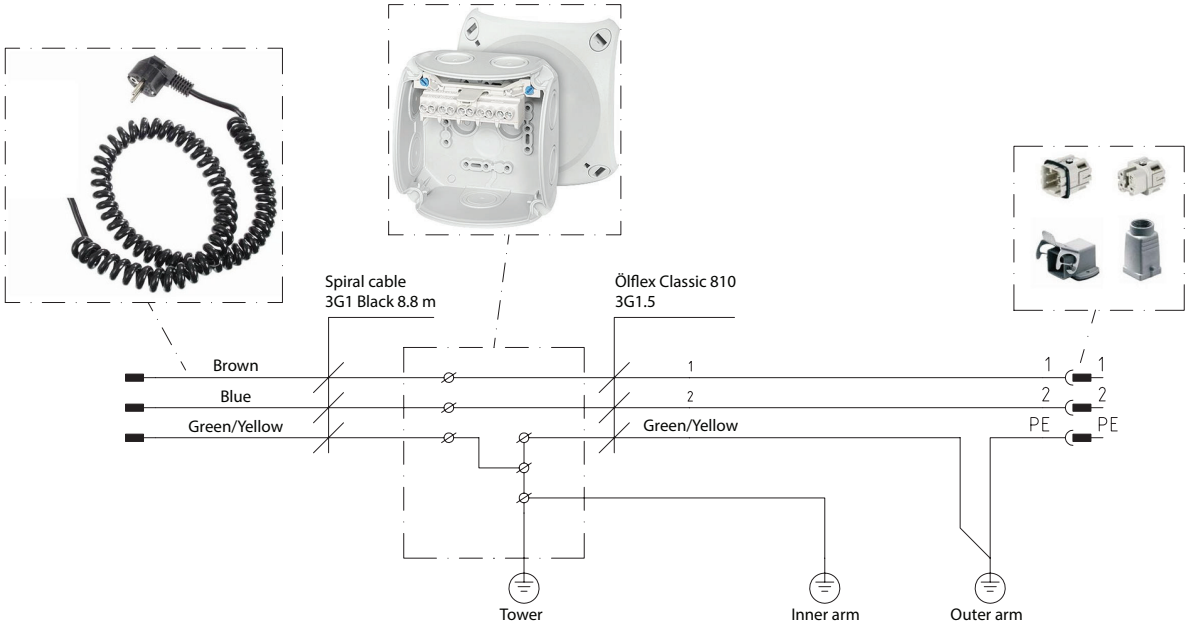
1. *Lock handle - closed*
2. *Lock handle - open*
3. *Lock nut*

5.8 Adjusting the outer brake

If the outer arm keeps turning, this is remedied by carefully tightening the slotted lock nut on the shaft that joins the inner and the outer arms (see image).



5.9 Electrical connection



6. Operating the crane

NB! Before any kind of work is performed on or with the MobiArm , the chapter “1. Safety” must have been carefully read.

A complete work station that includes a MobiArm, must have a specific description of the work to be performed which considers all the points indicated below.

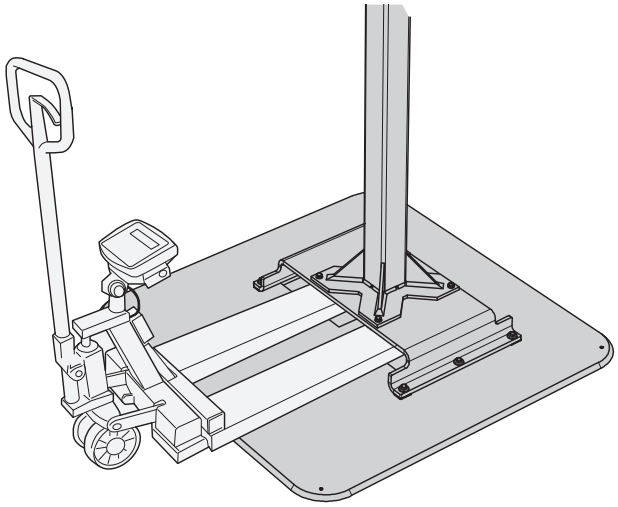
- the configuration
- the design and the function of the attached lifting equipment
- the characteristics and any variation in the lifted objects
- the work environment
- the selected working pace and work frequency

6.1 The crane

Moving a crane mounted on the mobile footplate

When moving a crane mounted on the mobile footplate, the crane arm must be placed in the parked position (see below) before performing the move. This will prevent the arm from moving about uncontrollably during the move.

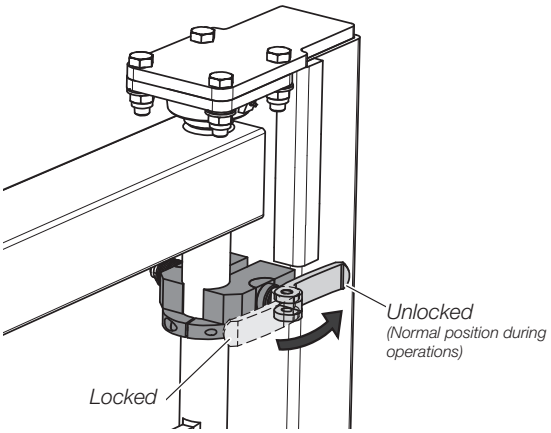
The crane is moved by using a hand pallet truck. The forks of the truck are inserted between the foot plate and the raised section where the tower is mounted.



Parking position, crane arms

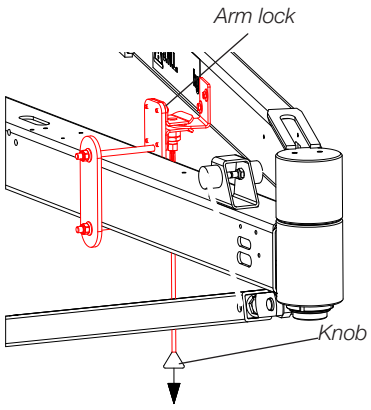
Locking the inner arm

The inner arm is locked in position by moving the eccentric tensioner of the inner brake into the locked position.



Locking the outer arm

The outer arm may be locked up against the inner arm.
Pull down on the knob to release the catch, and fold the outer arm against the inner arm.
Release the spring loaded knob to lock the outer arm in position.



7. Service, maintenance & care

General checks and function tests are performed regularly when commissioned.
A record must be kept of all service and maintenance. The user must ensure that all the required items for the jobs are available.
NB! In order to avoid any injury to personnel or damage to equipment, make sure to immediately replace any component that is damaged.
Keep the equipment and the area surrounding it and the work area properly cleaned. This will promote well-being and promotes all service and maintenance. Uncleanliness is a clear indication that the equipment is not handled in the required manner, which in turn may affect any remaining warranty on the equipment.

Safety instructions when performing maintenance

The instructions concerning adjustment, maintenance, inspection measures and their intervals, including instructions for replacing parts / components must be observed! These activities may be performed by skilled personnel only.

Mechanical, electrical and pneumatic repair and maintenance work as well as renovation work may only be carried out by personnel with the necessary skills and competences.

Unauthorized persons shall be prohibited from working with machinery and equipment in the facility.

For all repairs and maintenance work, disconnect, switch off and secure against accidental or unauthorized use.

Ensure that:

- moving parts have come to a stand-still, and
- moving parts cannot accidentally start moving during the performance of the work.

Use safe and environmentally friendly operating and maintenance products as well as replacement parts!

Instructions for work with the equipment in operation

The user or the "authorized person" employed by him must, for each particular case, check that the specified work, because of special local conditions, can be carried out without risk of personal injury.

To avoid accidents during maintenance, adjustment and repair work, only permitted and appropriate lifting tools and aids may be used.

Do not touch any rotating parts, and maintain sufficient safety distances to these so that clothing, body parts or hair can not get caught.

Avoid open flames, extreme heat (e.g. welding), and do not create any sparks when handling detergents or near combustible or heat sensitive parts (e.g. wood, plastic components, lubricants and electrical equipment) - negligence may lead to a risk of fire, harmful gases or damage to insulation materials.

Instructions for working with pneumatic equipment

Stop all work at once with the equipment if the is any problem with the compressed air.

Work with pneumatic equipment and pneumatic components shall be carried out by trained personnel.

The parts of the equipment on which inspection, maintenance and repair work is to be carried out must, when so directed, be disconnected off from compressed air supply.

Keep the equipment and the area surrounding it and the work area properly cleaned.

7.1 Recommended spare parts / wear parts

	743253	Adjustable tower		
#	Part no.	Designation		Quantity
11	743263	Bearing unit Ø35	S	2
17	743269	Lock arm M12x40	R	2
18	743417	End protector 30x30x10	S	2

	743254	Adjustable tower +500		
#	Part no.	Designation		Quantity
11	743263	Bearing unit Ø35	S	2
17	743269	Lock arm M12x40	R	2
18	743417	End protector 30x30x10	S	2

	743953	Fixed tower		
#	Part no.	Designation		Quantity
9	743263	Bearing unit Ø35	S	2
13	743417	End protector 30x30x10	S	2

	743255	Wall bracket		
#	Part no.	Designation		Quantity
10	743263	Bearing unit Ø35	S	2
14	743417	End protector 30x30x10	S	2

	743256	Inner arm 1m		
#	Part no.	Designation		Quantity
6	743270	Ball bearing	S	2

	743257	Inner arm 1.5m		
#	Part no.	Designation		Quantity
6	743270	Ball bearing	S	2

	743258	Inner arm 2m		
#	Part no.	Designation		Quantity
6	743270	Ball bearing	S	2

	743460	Inner brake		
#	Part no.	Designation		Quantity
3	743416	Eccentric tensioner M10	R	1
4	743461	Brake pad	S	2

7.2 Checks and maintenance

The crane and the arms are to be checked every 3-4 months depending on how much the equipment is used. Check things such as:

- fastening elements
  check that these are not damaged and that nuts and bolts are properly tightened
- the bearings between crane - inner arm and between inner arm - outer arm
  make sure the bearings aren't seized, that there is no noise when the arm is turned, and that there is no visible damage.
  Action; lubricate the bearings, replace them if so required
-

See the respective documentation for any attached equipment.

8. CE certificate

EC declaration of conformity of the machinery

TRANSLATION
(according to 2006/42/EG, annex 2A)

Manufacturer

RonI
8001 Tower Point Drive
Charlotte, NC 28227

Representative for documentation

hereby declares that the machinery

Designation	**Machine type**	**Version**
MobiArm	Knucle boom crane	

and that standards and/or technical specifications as described below are applied

☒ **Machinery Directive 2006/42/EC**

☒ **EMC Directive 2014/30/EU**

☒ **Low Voltage Directive 2014/35/EU**

and that standards and/or technical specifications as described below are applied.

☒ **Machinery Directive** SS-EN-ISO 12100:2010 SS-EN 14238:2004 + A1:2009	☒ **EMC Directive**	☒ **Low Voltage Directive** IEC 60204-32 IEC 60204-1

Place: USA **Date:**2019-02-28

Vacuhand V

TABLE OF CONTENTS

Symbol explanation

Warning!

Important information

Setup and adjustments

Check the equipment

This product is in accordance with applicable CE directives

VACUHAND PRO

140/160/180/200/230/250/300

Original instructions
2021-02-01

EN

CE

RON I

LIFT-O-FLEX

MOBI-Crane | movomech | Voyager

Contents

Symbol legend

⚠ Warning! Warning! This indicates the risk of serious injury or death if instructions are not followed. This includes the risk of serious damage to the machine or injury to third parties.

⚠ Caution! Caution! This indicates the risk of minor injury and equipment damage if instructions are not followed.

⚠ Attention! Attention! This indicates the risk of equipment damage or considerable reduction in equipment service life if instructions are not followed.

The equipment complies with EU Machinery Directive 2006/42/EG, appendix 21A, as well as EN ISO 12100:2010 and SS-EN 14238 2004+A1 2009.

Introduction

Vacuhand Pro is a Swedish-manufactured lifting device (tube lifter) based on vacuum technology. See Safety Instructions below for additional important information about how to evaluate items before they are lifted to determine if Vacuhand Pro may be utlized safely. Additionally, while the Vacuhand Pro itself is capable of lifting many types of objects, the operator must also read and understand the specific manual for the equipment to which the Vacuhand Pro is attached for additional restrictions on what may be safely lifted by any given “System”. I.e. there may be additional limitations or requirements that may exist beyond those specifically listed in this manual and it is the operator’s responsibility to ensure that they are aware of and obey all such limitations as well as all safety rules. For further information, contact your supplier.

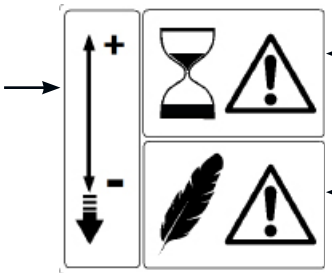
Vacuhand Pro is intended to facilitate lifting work with an emphasis on ergonomics, efficiency and safety. Movomech AB will assist with repair through authorized dealers and our support organization.

This manual addresses standard use of safety, installation, use, maintenance and troubleshooting; special Vacuhand Pro versions are not addressed. Information about special modifications to installations can be provided by your supplier. The equipment delivered may only be used to lift objects for which it is intended according to specifications from the supplier. If you need to use the lifter for other purposes, please contact your supplier. The peripheral equipment into which Vacuhand Pro is installed is not described in this manual. Refer to the separate descriptions of the equipment concerned for additional important information.

Movomech’s goal is to continually develop and improve the user-friendliness and design of our equipment. Accordingly, we reserve the right to future design changes.

Description of symbols on control levers

Operating: Up – Down – Release. Always use soft, light controlled movements when operating the lift. When releasing the load, open the control bar fully and tilt the lifter a little to release the suction foot.



Warning! Never let a load hang in the lifter for more than 60 seconds in each operation cycle.

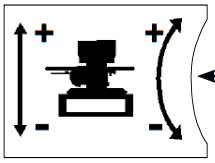
Always use soft, light controlled movements to avoid jerky operations.

Part no: 640010-03

Never stand or place any part of the body under a suspended load. Falling loads can cause serious injury or death.

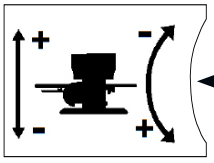
Part no: 640010-02

Users must read and understand the manuals before operating the machine.



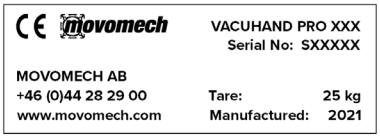
Adjustment with load.
Turn clockwise – Raises the load
Turn counterclockwise – Lowers the load

Part no:640010-04



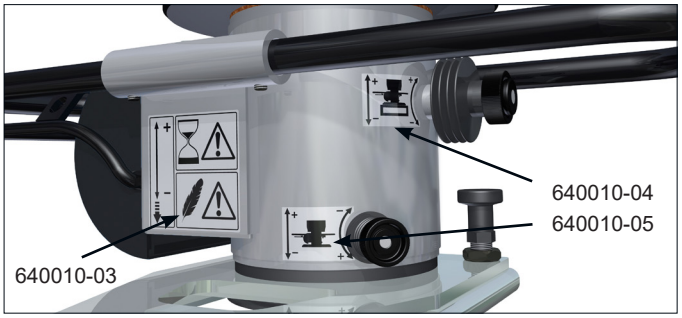
Adjustment without load.
Turn clockwise – The lifter is lowered
Turn counterclockwise – The lifter is raised

Part no: 640010-05



Part no: 640010-01

CE label with machinery model, serial number and year of manufacturing.



Safety instructions for Vacuhand Pro

Read through the safety instructions below as well as manual(s) for the equipment on which Vacuhand Pro is mounted before using Vacuhand Pro. Note that these other manuals may include instructions, warnings, or limitations for use of Vacuhand Pro beyond those listed below.

Vacuhand Pro may only be used by personnel and who have read and understood this manual, any manuals for related equipment as mentioned above, and any applicable standards and regulations. Movomech AB is not liable for any damage or injury caused by use or actions which are inconsistent with the training, manuals and any applicable standards and regulations. Such use is entirely at the user's risk.

General

⚠ Warning!

- Vacuhand Pro generates very a strong suction/negative pressure (vacuum). Do not attempt to seal the suction pad with any part of the body. Keep all body parts, clothing, and hair away from the suction pad and suction opening while the vacuum pump is operating.

⚠ Caution!

- Vacuhand Pro may only be used as intended for the materials and application described in this manual as well as any relevant equipment manuals and in accordance with the relevant safety regulations. Any other use is not as intended and is prohibited!
- The condition and serviceability of Vacuhand Pro must be inspected and tested prior to each use.
- Maintenance, servicing, lubrication and troubleshooting may only be performed by qualified persons who have read and understood all relevant manuals and who are trained and/or approved by Movomech AB or their authorized distributor.
- If a hazardous condition is identified during operation or servicing, Vacuhand Pro must not be used until the hazardous condition has been corrected.
- In the event of crack formation or other damage to Vacuhand Pro or its associated lifting tool(s), all use of the machine must immediately cease.
- Persons under the influence of drugs, alcohol or medications that affect their judgement and physical abilites must not be allowed to use, maintain nor repair Vacuhand Pro.
- Appropriate personal protective equipment should be used when operating the Vaculyft including steel toed boots, safety glasses and hearing protection as required by your employer and applicable regulations.
- The load is lifted and held using negative pressure. If there is a leak or power failure (interruption of fuel supply, blocked filter), the negative pressure is reduced and the load will be lowered to the ground. In the event of media outage, the operator should close the control handle and allow the load to be lowered in controlled fashion to the ground. Vacuhand Pro must not be used before the fault/cause of the outage has been rectified.
- The vacuum pump is the heart of the equipment – handle it carefully as it is sensitive to shocks and bumps.
- Never test run the vacuum pump without a connected air filter.

Load

⚠ Caution!

- The maximum allowable loads may be dependent on the equipment on which Vacuhand Pro is mounted. Never handle loads heavier than approved for the equipment. See relevant manual(s).
- Lifting tools are to be selected as dictated by the shape and weight of the load.
- Only use Vacuhand Pro to handle loads that are sufficiently solid to avoid the risk of their coming apart when lifted.
- Never attach the suction foot to surfaces that are loose or could come loose. Examples include but are not limited to address labels, taped objects, thin paper, etc.
- Never attach the suction foot to surfaces that are so slippery, oily, or wet that there is a risk of the load sliding in relation to the suction foot.
- Never lift objects that are sharp and that could damage the vacuum seal strip.
- Never lift hazardous or explosive materials without first ensuring that proper safety procedures, as designated by your employer, are in place.
- During operation of Vacuhand Pro the ambient temperature must be in the range of 5°C (+41°F) to +104°F (40°C). Below 3°C (+37.5°F) there is a danger of the load slipping due to ice formation.

Lifting

⚠ Warning!

- A suspended load shall not be allowed above any part of a person's body.
- Vacuhand Pro with load may not be maneuvered such that a falling load would risk personal injury or material damage.
- Never try to lift people or animals.
- The area of the suction foot must be at least 2.5 times greater than the cross-sectional area of the lifter tube to avoid unintentional release of the load.

⚠ Caution!

- Never leave a suspended load unattended.
- Never suspend a load for more than 60 seconds or the vacuum pump may overheat.
- Never try to manually assist the up or down movement of Vacuhand Pro when it has a load attached.
- Always adjust the balance height in relation to the load to allow for convenient and safe handling.
- A load which is fixed or jammed in position must not be pulled free with Vacuhand Pro.
- Always use smooth controlled movements when working with Vacuhand Pro. Jerky operation can result in the load working loose and is therefore prohibited.
- The identification plate attached to Vacuhand Pro must not be removed.

⚠ Attention!

Important information

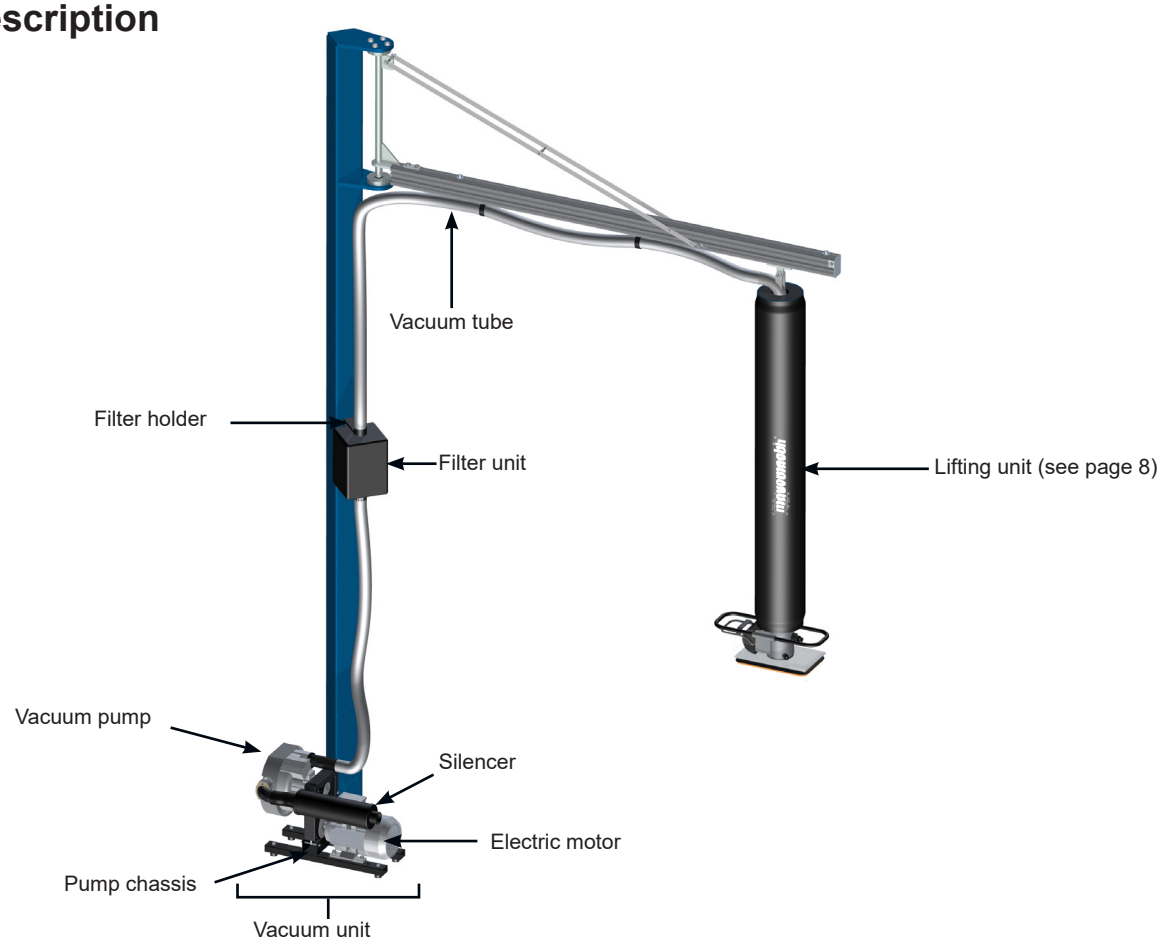
- Read through the entire manual and get to know the equipment before it is assembled and put to use.
- Operate Vacuhand Pro gently and carefully using the control levers in order to avoid jerky movements when lifting.
- The area of the suction foot must be at least 2.5 times greater than the cross-sectional area of the lifter tube to avoid unintentional release of the load (see examples of calculation on page 9 and 10).
- The equipment must be switched off during maintenance and cleaning.
- The vacuum pump is the heart of the equipment – handle it carefully as it is sensitive to shocks and bumps. Never test run the vacuum pump without a connected air filter.
- Loads may not be raised before Vacuhand Pro and its gantry or turntable crane are positioned vertically above the load.

Prohibited use

⚠ Warning!

Under no circumstances may the tube lifter's design or structure be modified without permission from the manufacturer. Only ever use accessories or spare parts from Movomech AB. Modifications that are not approved by Movomech AB and/or the use of non-approved accessories or spare parts can cause serious injury during lifting operations. The maximum load may never be exceeded.

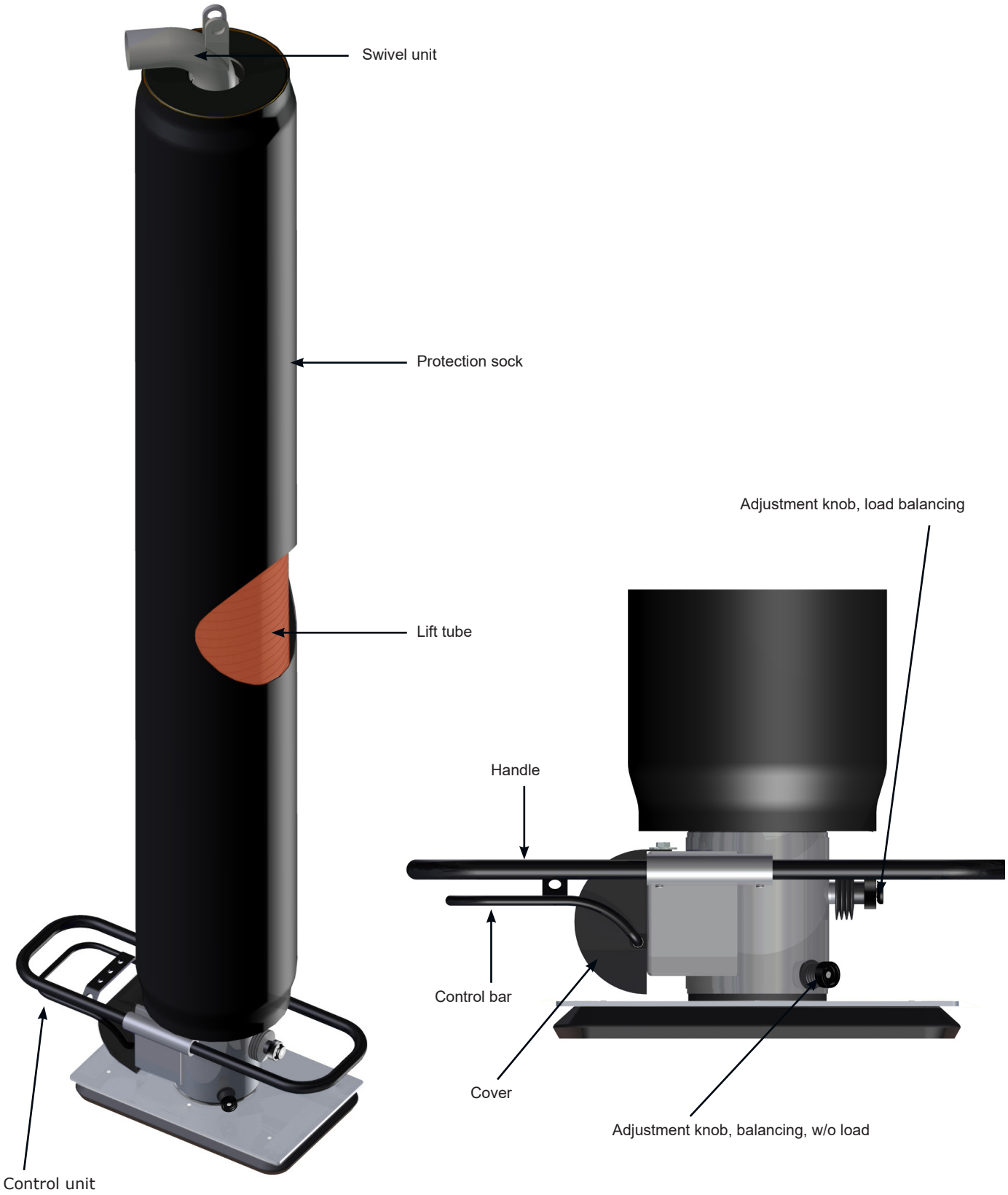
Product description



Example showing installation with jib crane

Example showing installation with crane system

Lifting unit



Installation

⚠ Caution! Make sure the correct components have been delivered and that they correspond to the delivery note/shipping documentation. If anything is missing, contact your supplier.

⚠ Caution! Read through the manual carefully before installation in order to avoid problems during assembly and commissioning.

⚠ Warning! From a safety standpoint, it is necessary to have a good understanding of the equipment. Vacuhand Pro is delivered with an electric or pneumatic vacuum pump. Carefully follow the directions and/or manual during installation.

Safety regulations for installation

- The person in charge of installation is responsible for making sure that the entire lifting system (e.g. overhead crane system) is designed to safely handle the sum total of Vacuhand Pro's tare weight plus the maximum allowable load including all necessary safety factors.
- Electrical installation must be carried out by an authorized electrician.
- In the case of jib crane installations, follow Movomech's installation instructions for jib cranes which are provided by Movomech AB.
- In the case of crane system installations, follow the supplier's assembly instructions.
- The lifting unit is hung from a suspension lug. Make sure that other suspension devices are sufficiently dimensioned and that they are secured against falls where necessary.
- Once the lifting unit is suspended, the suction foot should be around 3.9 in. (100 mm) above the floor. If the suction foot is closer to the floor, the tube must be cut (refer to Cutting the lifter tube) or the suspension system raised.
- If the suction foot is higher than 3.9 in. (100 mm), it must be lowered by lowering the lifting unit or installing a longer lifter tube.

⚠ Warning! Check that the suction foot to be used with the lifting unit concerned has a safety factor of at least 2.5. The area of the suction foot must be at least 2.5 times greater than the cross-sectional area of the lifter tube to avoid the load coming loose unintentionally.

Sample calculation:

Lifter tube cross-section: Radius x Radius x 3.14 (π) = Area

Suction foot area, rectangular: Length x Width x Number of suction feet = Area

Suction foot area, round: Radius x Radius x 3.14 x Number of cups = Total area

Example 1

Single rectangular suction foot 8.3x13 in (210x330 mm) and lifter tube Ø 5.5 in (140 mm)

Inches:

Suction foot: 8.3 x 13 in x 1pc ≈ 107.9 sq in

Lifter tube: (2.75 x 2.75 in) x 3.14 x 1pc ≈ 23.75 sq in

Safety factor: 107.9 / 23.75 sq in ≈ 4.54 In this case the safety factor is approximate 4.54, which is sufficient by a good margin.

Metrics:

Suction foot: 210 x 330x 1pc ≈ 69.300mm²

Lifter tube: (70 x 70 mm) x 3.14 x 1 ≈ 15.386 mm²

Safety factor: 69.300 / 15.386 mm² ≈ 4.50)

In this case the safety factor is approximate 4.5, which is sufficient by a good margin.

Example 2

Lifting yoke with 4 pcs round Ø5.9 in (150 mm) suction cups and lifter tube Ø 6.3 in (160 mm)

Inches:

Suction cup, round 6.3 in (150 mm): (2.95 x 2.95) x 3.14 x 4 pc ≈ 109.3 sq in

Lifter tube: (3.15 x 3.15 in) x 3.4 x 1pc ≈ 31.16 sq in

Safety factor: 109.3 / 31.16 sq in ≈ 3.50

In this case the safety factor is approximate 3.50, which is sufficient by a good margin.

Metrics:

Suction cup, round 150: 75 x 75 x 3.14 ≈ 17.662 mm² x 4pcs = 70.648 mm²

Lifter tube: 80 x 80 x 3.14 ≈ 20.096 mm²

Safety factor: 70648 / 20.096 mm² ≈ 3.51

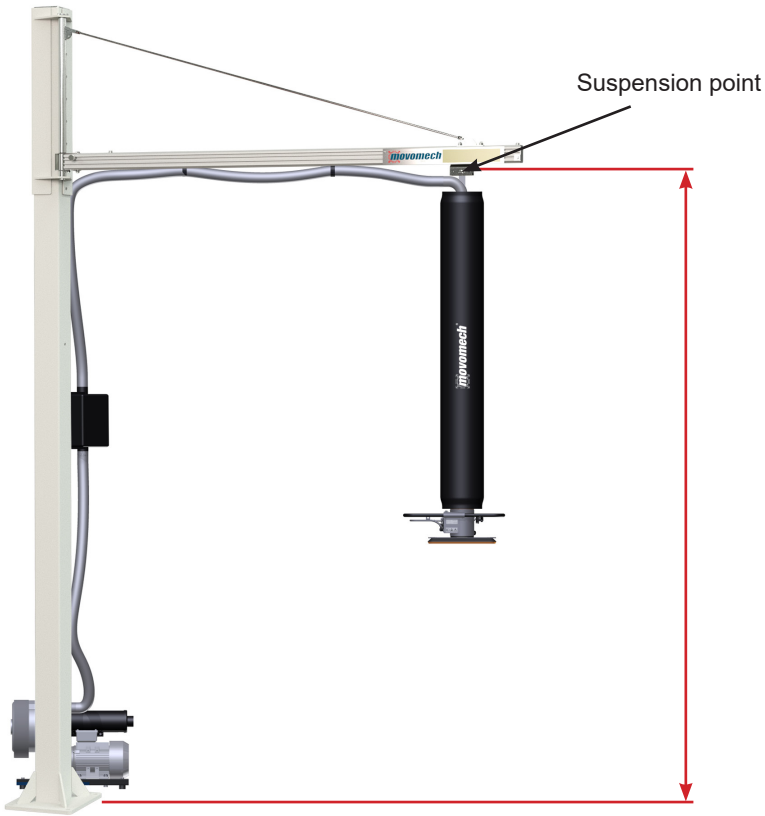
In this case the safety factor is approximate 3.50, which is sufficient by a good margin.

Cutting the lifter tube

In some cases, the lifter tube must be cut if the suspension height (the measure between the ground till the suspension point (see figure below) is lower than 9.5 ft (2.9 m).

The following is required:

- Knife
- Scissors
- Metal shears
- Cutting pliers
- Woven tape, part #700PS618

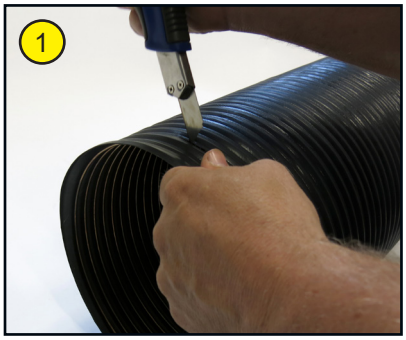


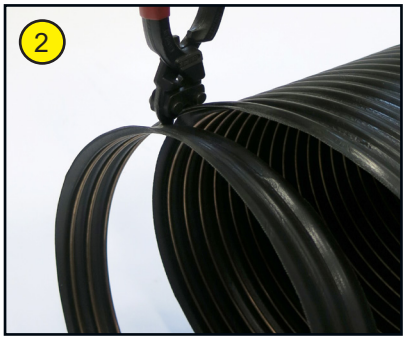
- Follow all local lockout tagout regulations to ensure that all sources of stored energy are controlled and made safe. Examples include but are not limited to the vacuum pump and gravitational energy due to the suspended components of Vacuhand Pro.
- Remove the protection sock, the woven tape and unscrew the lifter tube from the plastic adapter. Measure how much of the lifter tube must be removed to achieve the intended height above the floor.
- Cut the lifter tube (figure 1) and clip the steel wire (figure 2).
- Cut away the surplus fabric from the lifter tube (figure 3).
- Carefully bend in the end of the steel spiral so that it follows the external diameter of the tube (figure 4).

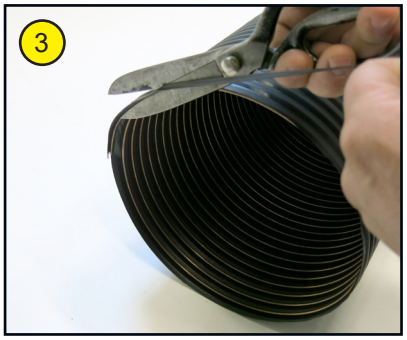
Installing/re-installing the lifter tube

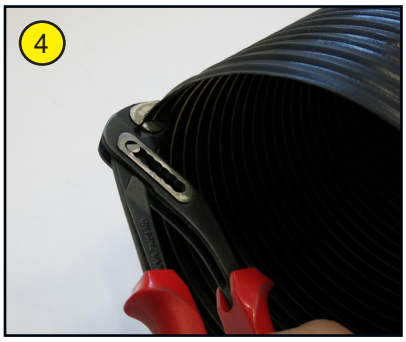
The installation instructions apply to both ends of the tube.

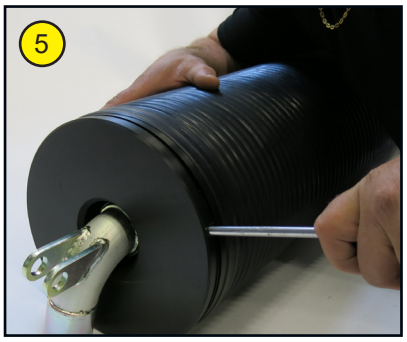
- Unscrew the lifter tube from the tube adapter. In the case of a large diameter lifter tube, a screwdriver or similar may be used as an aid (figure 5). Leave 3/8 in. (1cm) of the tube adapter visible (figure 6).
- **⚠ Attention!** **Next, wind 3 or 4 turns of woven tape, Movomech part # 700PS618, around the tube adapter and tube (figure 7). Begin tape coverage around 3/16 in. (5 mm) above the edge of the tube adapter. The tape must be tightly wound.**
- Fold down the tape and secure it against the tube adapter (figure 8).
- Fit the protection sock.

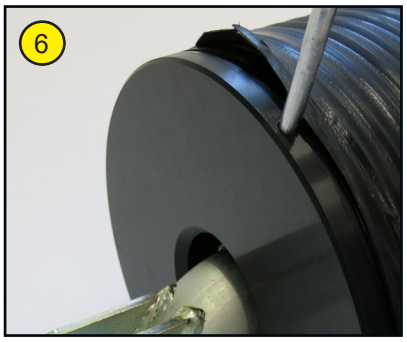


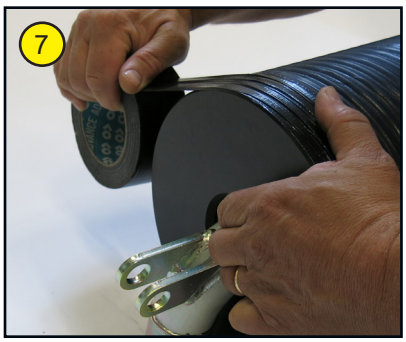


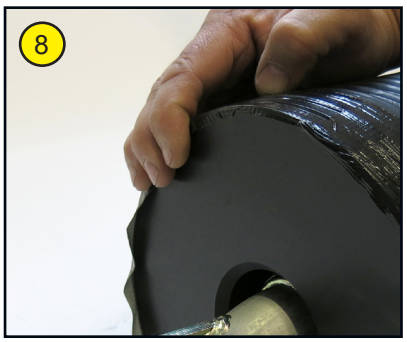












Installing the electric vacuum pump

To keep the vacuum tube short, always locate the vacuum pump as close to the lifting unit as possible.

In order to enjoy the highest possible speed during lifts, it is important that the vacuum tube between the vacuum pump and the lifting unit not be too long. A long vacuum tube reduces the ability of the lifting unit to use all of the vacuum pump's capacity. We recommend that tube length between the vacuum pump and the lifting unit not exceed 82 ft. (25 m). In the case of greater distances, contact the supplier.

⚠ Attention! With regard to its heat generation, install the pump in a well-ventilated space. Make sure the pump is positioned such that it is surrounded by a free area of at least 11.8 in. (30 cm) on all sides and that there is no risk of objects blocking the pump's ventilation holes.

⚠ Attention! Make sure the pump stands firmly. If it is not placed on the floor, it must be secured so that it does not fall or tip over.

⚠ Caution! Check that the belt guard is installed.

⚠ Caution! Electrical installation must be performed by an authorized electrician.

⚠ Caution! **Always remove the protective plug from the pump suction pipe before start.**

⚠ Caution! **Note! Never test run the pump without a connected air filter.**

The electrician must check that air blows out of the silencer to confirm the correct direction of rotation for the electric vacuum pump motor. The pump can be damaged if it runs backwards.

If multiple Vacuhand Pro are installed, vacuum pumps must be marked to clearly indicate which Vacuhand Pro unit they are connected to.

⚠ Warning! **The installation may not be put to use before an authorized electrician has installed suitable circuit breaker. Failure to install a circuit breaker is a fire risk!**

Installing the electric vacuum pump, vacuum tube and air filter

⚠ Attention!

- The air filter must be located so that it is easy to access for replacement; it must be clear which lifting unit it is connected to. Begin by hanging the vacuum tube from the suspension system to which the lifting unit is attached (e.g. in a gantry, turntable crane, etc.). Connect the vacuum tube to the lifting unit's top swivel and to the air filter.
- Connect the other vacuum tube between the air filter and the vacuum pump.
- **⚠ Caution!** **Note! The arrow on the air filter must point towards the tube that goes to the vacuum pump.**
- Make sure the vacuum tube is not exposed to crush risk anywhere along its length or can come into contact with objects that might damage it.

Test runs

⚠ Caution!

- Lift a load with a completely smooth, non-porous surface. Let the load hang suspended in the lifter while listening for hissing sounds to make sure there are no leaks anywhere in the installation.
- Lift a load that weighs 22 lb (10 kg) and has a completely smooth, non-porous surface. Let the load hang suspended in the lifter and then switch off the vacuum pump. The load, together with the lifting unit, should now sink slowly to the floor. When the lifter tube is fully stretched, a greater vacuum is raised in the tube to provide an extra soft sink rate.
- Lift a completely smooth, non-porous load at the installation's maximum permissible weight; refer to Troubleshooting (page 20) if the load is not raised.

Maximum load label

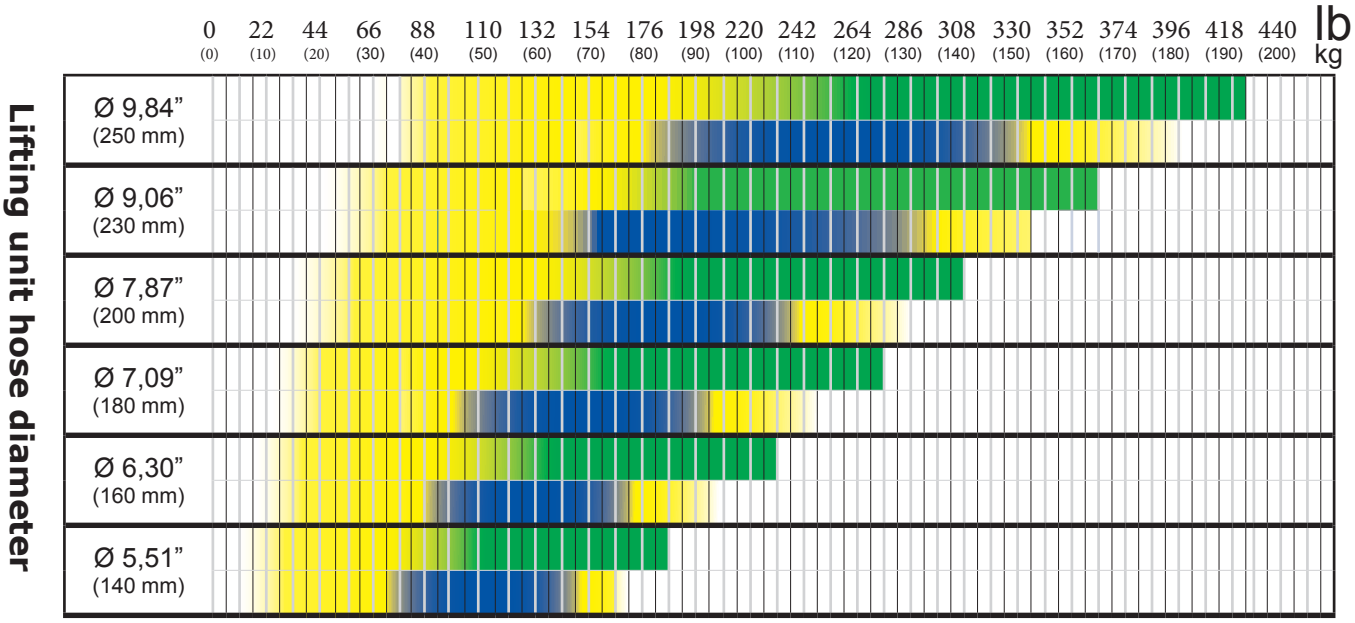
⚠ Attention!

Affix a maximum load label to the control unit following Vacuhand Pro installation in a gantry system. The maximum load must correspond to Vacuhand Pro's maximum load together with the gantry system's maximum load. **Note that Vacuhand Pro does not provide maximum load labels as standard equipment.** They can however be ordered for each respective installation. The next page provides information about Vacuhand Pro's maximum loads.

Lift capacity

= Green indicates recommended lifting capacity for loads of a smooth, non-porous material. Yellow indicates possible lift range depending on the shape of suction feet etc.

= Blue indicates recommended lifting capacity for objects of porous material. Yellow indicates possible lift range depending on the shape of suction feet etc.



The bars in the chart show the recommended load weight for smooth, non-porous/porous material that can be handled by a specific lifting unit. The recommendations are based on appropriate lifting speeds. Light loads are lifted more quickly than heavy loads. Solid material such as sheet-metal is lifted more quickly than porous material such as cardboard. Never use the lifting unit/pump combination for loads heavier than those recommended.

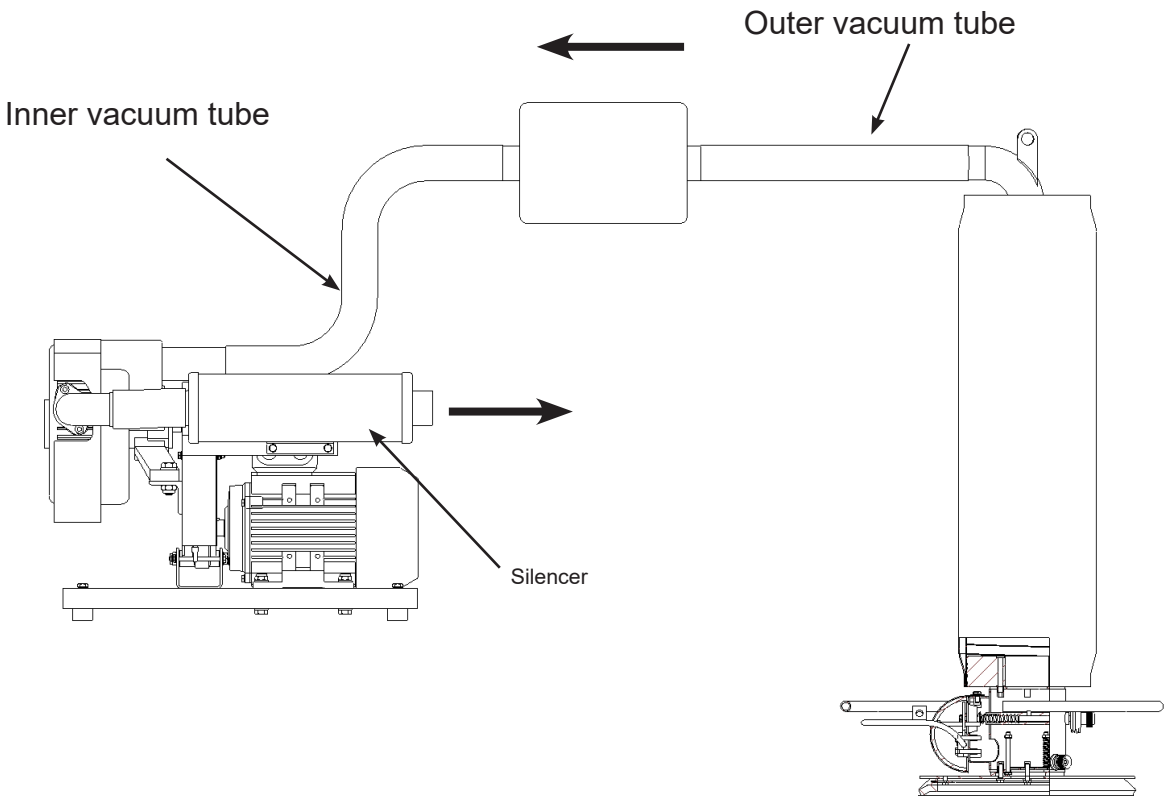
Generally speaking, always try to use the largest possible tube diameter to achieve the gentlest lifting movement.

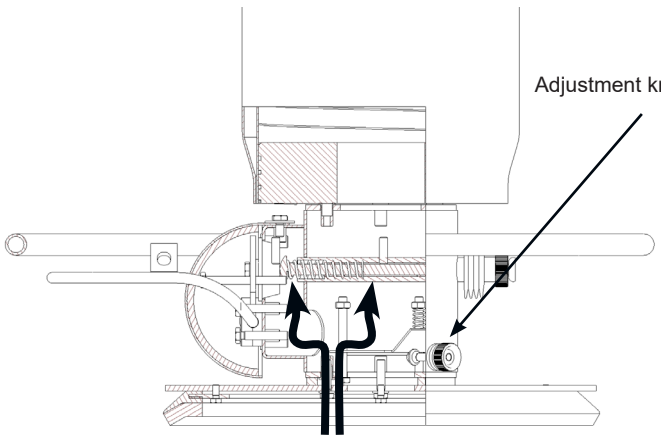
How to interpret the chart:

A Vacuhand Pro 160/25 (lifter tube diameter 6,3 in (160 mm), pump model 25 G200) is recommended for lifting solid loads with weights from around 110 lb (50 kg) up to around 230 lb (104 kg), and porous loads with weights from around 88 lb (40 kg) up to around 171 (77.5 kg).

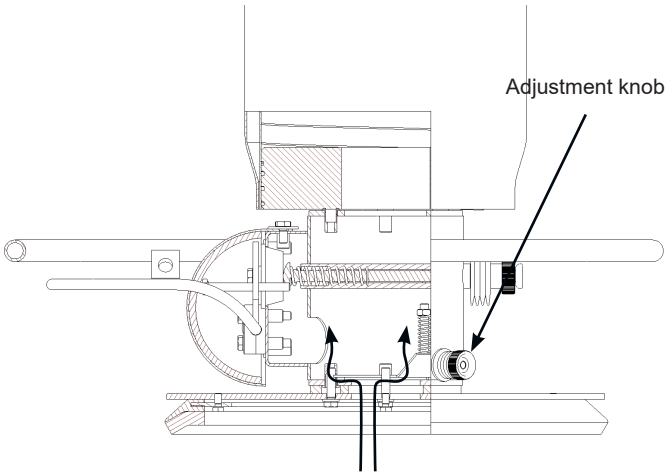
Function

Balancing without load





Turning the adjustment knob clockwise. The bottom valve opens. The lifter is lowered.

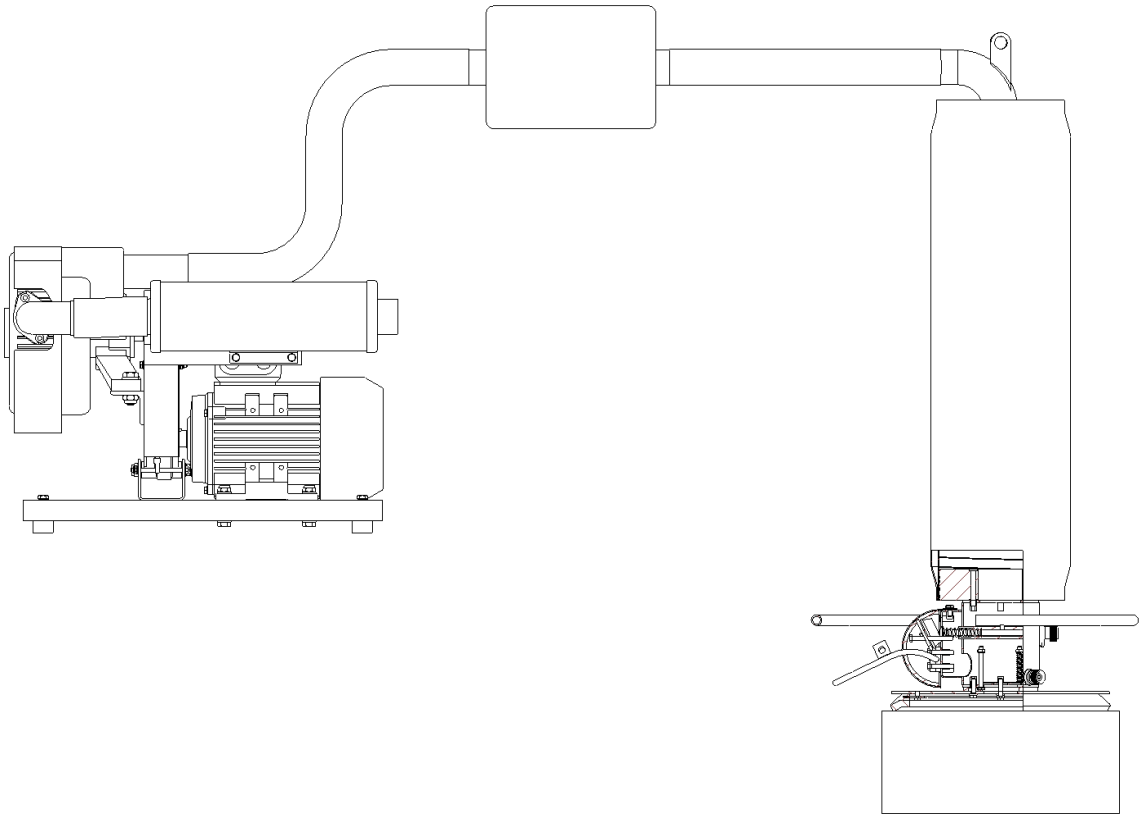


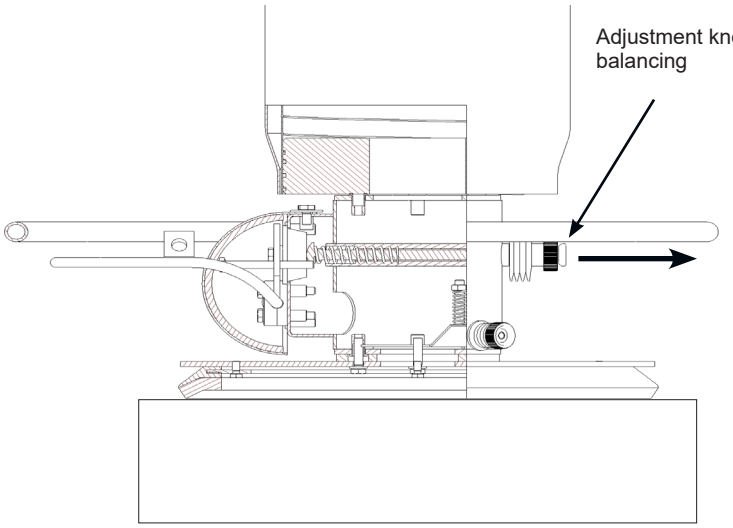
Turning the adjustment knob counterclockwise. The bottom valve is closed. The lifter is raised.

When the vacuum pump is running, a negative pressure is formed inside the lifting unit. In order to prevent the lifter tube from collapsing, air is bled in through a bottom valve. This air reduces the negative pressure in the lifter tube. The amount of bleed air is regulated by the knob for balancing without load.

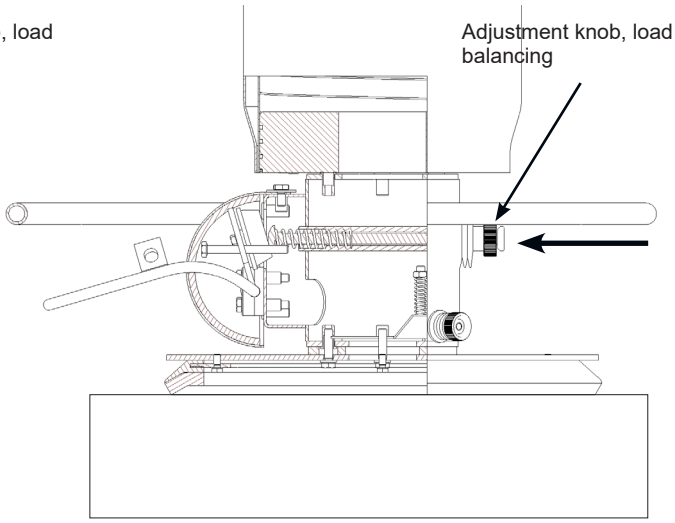
⚠ Warning! Never fully close the bottom valve adjustment knob when lifting porous materials. This can cause insufficient flow in the suction foot and there is a risk of its dropping or not being able to grip the load.

Balancing with load





Turning the adjustment knob counterclockwise. When the operating handle is closed, the lifter and the load are raised.

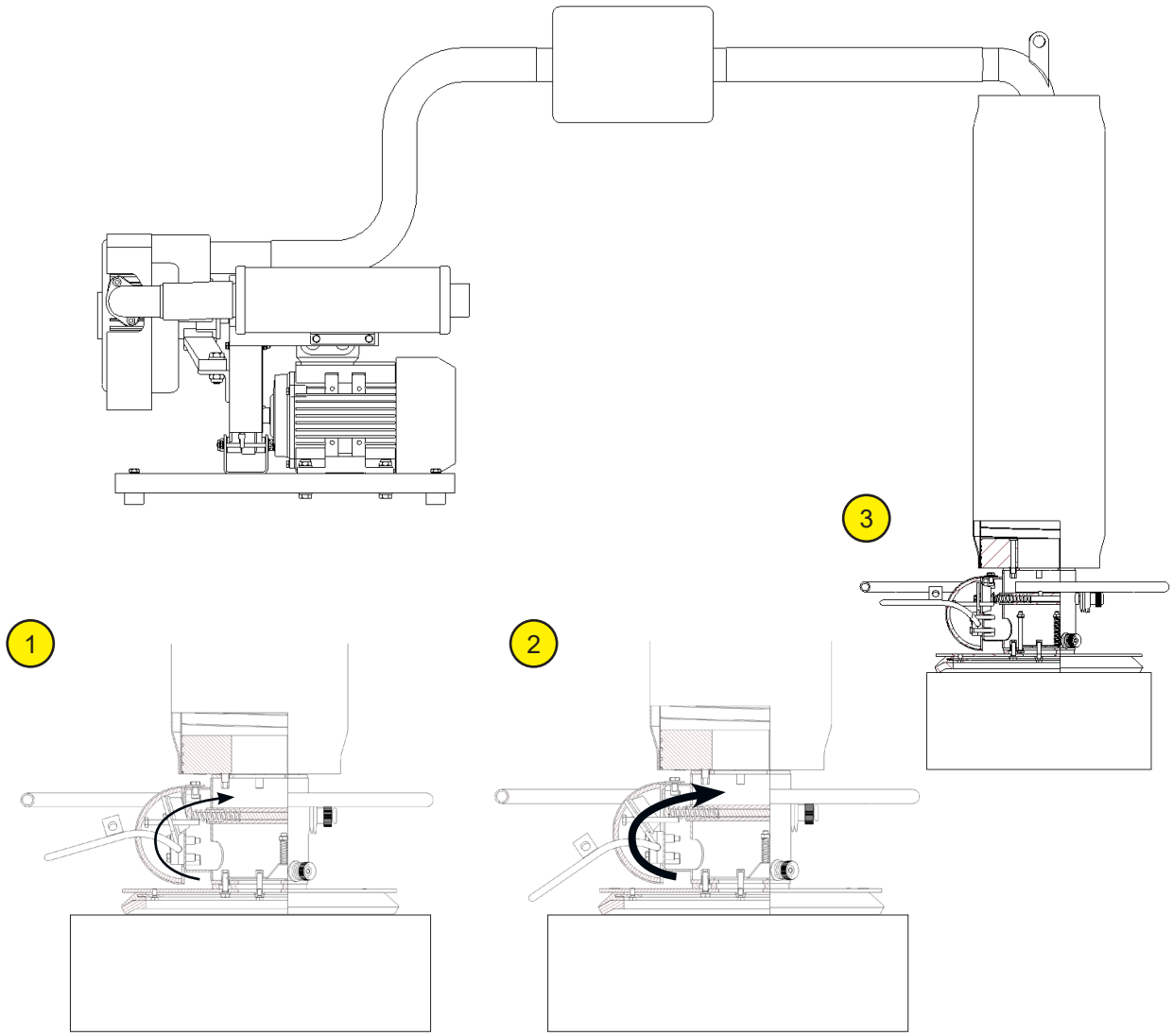


Turning the adjustment knob clockwise. When the operating handle is opened, the lifter and the load are lowered.

The load is adjusted to the preferred working height using the balance knob.

Set Vacuhand Pro balance to the average weight when lifting loads of varying weights.

Operating with load



When a load seals against the suction foot, air only enters Vacuhand Pro via the operating valve.

Operating handle in position 1:

The handle valve is partially open and the amount of air allowed into the lifting tube is controlled by the load balancing adjustment knob as described previously. **Used when moving a suspended load.** With the handle is in this position and the load balancing adjustment knob set properly the load should not move up and down on its own.

Note that the position of the operating handle is continuously variable between these three positions and small movements of the handle can be used to change the vacuum level to raise and lower the load in a controlled fashion.

Operating position 2:

The handle valve is wide open. In this position so much air flows in through the valve that the negative pressure is alleviated and a lowering movement takes place. **Used to lower the suction foot** to the object to begin a lift and to **release the suction foot** from the object after placement.

Operating handle in position 3:

The handle valve is fully closed. The negative pressure in the lifter tube is intensified and the tube contracts causing a lifting motion to take place. **Used to lift the object** after proper placement of the suction foot.

Maintenance

⚠ Attention!

In order to ensure safe equipment function and to preserve lifting capacity, follow the maintenance instructions. Remedy any faults detected in Vacuhand Pro immediately. Vacuhand Pro may not be used until the defects are remedied.

⚠ Warning! The equipment must be switched off prior to maintenance.

⚠ Caution! Only use original Vacuhand Pro parts for maintenance, repairs, or replacement.

Daily checks:

- Check the filter daily in dirty or dusty conditions. Shake out and vacuum clean the filter. Damaged filters or filters that cannot be cleaned must be replaced.
- Check that the sealing strip on the suction plate is in satisfactory condition. If necessary, clean the strip with water. A defective sealing strip must be replaced.
- Visually inspect various parts of the machine for damage, cracking, and corrosion.

⚠ Warning!

Damaged or extremely dirty filters can harm the pump. This may cause loads to be dropped and injure the operator and or others. If the air filter is not cleaned, lifting capacity will eventually be lost and there is a risk that the vacuum pump will run hot.

Weekly checks:

Test the check valve (located at the top of the lifter tube) to ensure that loads do not drop quickly if power to the vacuum pump is lost.

- Start the vacuum pump.
- Lift a smooth, non-porous load of around 22 lb (10 kg) and let it hang.
- Switch off the vacuum pump. The load should now sink slowly to the floor.

⚠ Warning!

Warning: Do not use Vacuhand Pro when load sinks quickly. Contact your dealer to determine appropriate repair.

- Inspect and assure that the filter is not clogged or damaged.
- Inspect and assure that the suction foot's rubber strip is not damaged.
- Inspect and assure that the lifter tube is not damaged.
- The lifter tube will stretch over time. Inspect and assure that the suction foot does not reach the floor. Shorten the lifter tube as necessary; refer to page 10, Cutting the lifter tube.

Quarterly checks:

- Inspect and assure that the suspension lug and the equipment Vacuhand Pro is suspended from is not damaged.

⚠ Warning!

Do not use Vacuhand Pro when there is damage to the lift. Contact your dealer to determine appropriate repair.

- Inspect and assure that the nuts and bolts in the suspension system are tightened and secured where applicable.

- Inspect and assure that the vacuum tube and lifter tube are airtight and are not chafed or crushed.

Troubleshooting

Fault	Possible causes	Action
Poor or no lifting power	The vacuum pump is not on?	Start the vacuum pump.
	The vacuum pump is not starting?	Check that that vacuum pump is not stuck. This can be caused by dirt, if the filter is not correctly cleaned. Contact your dealer for the manufacturer's recommended replacement component.
	The vacuum filter is clogged up?	Clean or replace the filter.
	Is the filter unit cover correctly installed?	Secure the cover correctly.
	The sealing strip of the suction plate is dirty/defective?	Clean or replace with a new sealing strip.
	Control handle damaged?	Contact your dealer for the manufacturer´s recommended replacement component.
	Leak in the vacuum system? Vacuum hoses?	Check that all hose connections for vacuum hoses are tight. Check that the vacuum hose is intact and does not leak. Repair temporarily with woven tape Part # 700PS618. Order new hose and replace the old one as soon the part arrives.
	Leak in the vacuum system? Lifting tube. The load raised very slowly and speed up with increased height.	Check the lifting tube ends that there are no damages and the tube is not crushed. Repair with woven tape part # 700PS618 if it is a small leakage. Otherwise cut or replace lifting tube.
	Leak in the vacuum system? Quick connection, suction foot, ...	Check that the quick-release coupling for tool changes is correctly fitted and that the sealing and O-ring are not damaged. Always replace both parts if any of them are damaged.
	Debris in the suction foot?	Clean and remove the debris from the suction foot.
	Is the load too heavy?	Check that the weight corresponds to Vacuhand Pro´s lifting capacity.
	Is the load too porous?	Check the porosity of the load with the supplier.
	Still no lifting power?	Contact your dealer for the manufacturer's recommended action to solve the problem.

Fault	Possible causes	Action
The load does not sink slowly in power outage test.	Check if the check valve is damaged or leaking?	Refer to Maintenance, Weekly checks (page 18)

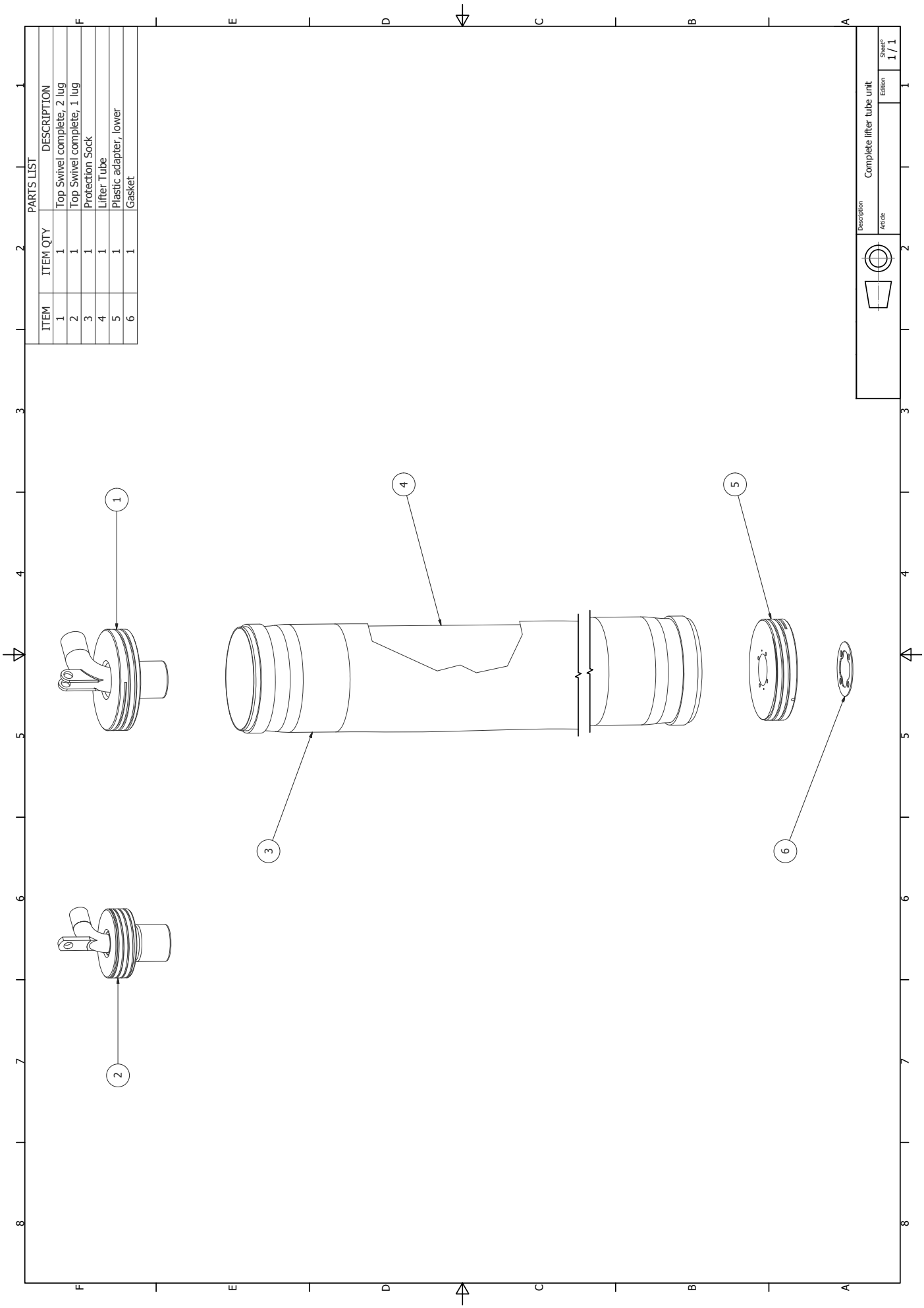
Fault	Possible causes	Action
Not possible to set desired balance level position for no load.	Check balancing knob without load?	Check for damage on knob or if its stuck. Contact your dealer for the manufacturer´s recommended replacement component.
	Check that no debris is lodged in the balance valve?	Check in bottom of the control unit by lifting in the bottom valve to visually see if there trash inside. If nothing visually seen remove the control unit from the lifter tube (see, “Cutting the lifter tube” page 10 and “Installing/re-installing the lifter tube” on page 11) Clean and remove trash.

Fault	Possible causes	Action
The vacuum pump will not start/rotate	Low oil level (hydraulic driven pump unit)?	Refill oil.
	Drive belt defective/incorrect belt tension?	Replace drive belt and/or adjust belt tension.
	Dirt/moisture in the vacuum pump?	Contact your dealer.
	Rupture in the hydraulic hose (hydraulik driven pump unit)?	Contact your dealer.

Fault	Possible causes	Action
Abnormal sound from the vacuum pump during normal operation (a whining sound is normal during operation).	Low hydraulic oil level (hydraulic driven pump units)? Incorrect belt tension?	Refill hydraulic oil. Adjust the belt tension.

If the fault remains after going through the points above, contact your dealer.

Spare parts


PARTS LIST
ITEM | ITEM QTY | DESCRIPTION
1 | 1 | Top Swivel complete, 2 lug
2 | 1 | Top Swivel complete, 1 lug
3 | 1 | Protection Sock
4 | 1 | Lifter Tube
5 | 1 | Plastic adapter, lower
6 | 1 | Gasket
Description
Complete lifter tube unit
Article
Edition
Sheet°
1 / 1

Complete lifter tube units

Part # Designation

Vacuum lifter, single lug suspension

640465-10 Lifter tube unit 140 Ø 5.51” (140 mm) std 1 lug 98.43” (2.5 m)
640475-10 Lifter tube unit 160 Ø 6.30” (160 mm) std 1 lug 98.43” (2.5 m)
640485-10 Lifter tube unit 180 Ø 7.09” (180 mm) std 1 lug 98.43” (2.5 m)
640495-10 Lifter tube unit 200 Ø 7.87” (200 mm) std 1 lug 98.43” (2.5 m)
640498-10 Lifter tube unit 230 Ø 9.06” (230 mm) std 1 lug 98.43” (2.5 m)
640505-10 Lifter tube unit 250 Ø 9.84” (250 mm) std 1 lug 98.43” (2.5 m)
640515-10 Lifter tube unit 300 Ø 11.8” (300 mm) std 1 lug 98.43” (2.5 m)

Vacuum lifter, twin lug suspension

640465-20 Lifter tube unit 140 Ø 5.51” (140 mm) std 2 lug 98.43” (2.5 m)
640475-20 Lifter tube unit 160 Ø 6.30” (160 mm) std 2 lug 98.43” (2.5 m)
640485-20 Lifter tube unit 180 Ø 7.09” (180 mm) std 2 lug 98.43” (2.5 m)
640495-20 Lifter tube unit 200 Ø 7.87” (200 mm) std 2 lug 98.43” (2.5 m)
640498-20 Lifter tube unit 230 Ø 9.06” (230 mm) std 2 lug 98.43” (2.5 m)
640505-20 Lifter tube unit 250 Ø 9.84” (250 mm) std 2 lug 98.43” (2.5 m)
640515-20 Lifter tube unit 300 Ø 11.8” (300 mm) std 2 lug 98.43” (2.5 m)

Vacuum lifter, single lug suspension, 3 m tube

640465-13 Lifter tube unit 140 Ø 5.51” (140 mm) std 1 lug 118.11” (3 m)
640475-13 Lifter tube unit 160 Ø 6.30” (160 mm) std 1 lug 118.11” (3 m)
640485-13 Lifter tube unit 180 Ø 7.09” (180 mm) std 1 lug 118.11” (3 m)
640495-13 Lifter tube unit 200 Ø 7.87” (200 mm) std 1 lug 118.11” (3 m)
640498-13 Lifter tube unit 230 Ø 9.06” (230 mm) std 1 lug 118.11” (3 m)
640505-13 Lifter tube unit 250 Ø 9.84” (250 mm) std 1 lug 118.11” (3 m)
640515-13 Lifter tube unit 300 Ø 11.8” (300 mm) std 1 lug 118.11” (3 m)

Vacuum lifter, twin lug suspension, 3 m tube

640465-23 Lifter tube unit 140 Ø 5.51” (140 mm) std 2 lug 118.11” (3 m)
640475-23 Lifter tube unit 160 Ø 6.30” (160 mm) std 2 lug 118.11” (3 m)
640485-23 Lifter tube unit 180 Ø 7.09” (180 mm) std 2 lug 118.11” (3 m)
640495-23 Lifter tube unit 200 Ø 7.87” (200 mm) std 2 lug 118.11” (3 m)
640498-23 Lifter tube unit 230 Ø 9.06” (230 mm) std 2 lug 118.11” (3 m)
640505-23 Lifter tube unit 250 Ø 9.84” (250 mm) std 2 lug 118.11” (3 m)
640515-23 Lifter tube unit 300 Ø 11.8” (300 mm) std 2 lug 118.11” (3 m)

Vacuum lifter, single lug suspension, 4 m tube

640465-14 Lifter tube unit 140 Ø 5.51” (140 mm) std 1 lug 157.48” (4 m)
640475-14 Lifter tube unit 160 Ø 6.30” (160 mm) std 1 lug 157.48” (4 m)
640485-14 Lifter tube unit 180 Ø 7.09” (180 mm) std 1 lug 157.48” (4 m)
640495-14 Lifter tube unit 200 Ø 7.87” (200 mm) std 1 lug 157.48” (4 m)
640498-14 Lifter tube unit 230 Ø 9.06” (230 mm) std 1 lug 157.48” (4 m)
640505-14 Lifter tube unit 250 Ø 9.84” (250 mm) std 1 lug 157.48” (4 m)
640515-14 Lifter tube unit 300 Ø 11.8” (300 mm) std 1 lug 157.48” (4 m)

Vacuum lifter, twin lug suspension, 4 m tube

640465-24 Lifter tube unit 140 Ø 5.51” (140 mm) std 2 lug 157.48” (4 m)
640475-24 Lifter tube unit 160 Ø 6.30” (160 mm) std 2 lug 157.48” (4 m)
640485-24 Lifter tube unit 180 Ø 7.09” (180 mm) std 2 lug 157.48” (4 m)
640495-24 Lifter tube unit 200 Ø 7.87” (200 mm) std 2 lug 157.48” (4 m)
640498-24 Lifter tube unit 230 Ø 9.06” (230 mm) std 2 lug 157.48” (4 m)
640505-24 Lifter tube unit 250 Ø 9.84” (250 mm) std 2 lug 157.48” (4 m)
640515-24 Lifter tube unit 300 Ø 11.8” (300 mm) std 2 lug 157.48” (4 m)

Lifter tubes

Part # Designation

Vacuum lifter 2.5 m

640461	Lifter tube 140 Ø 5.51” (140 mm) std 1 lug 98.43” (2.5 m)
640471	Lifter tube 160 Ø 6.30” (160 mm) std 1 lug 98.43” (2.5 m)
640481	Lifter tube 180 Ø 7.09” (180 mm) std 1 lug 98.43” (2.5 m)
640491	Lifter tube 200 Ø 7.87” (200 mm) std 1 lug 98.43” (2.5 m)
640499	Lifter tube 230 Ø 9.06” (230 mm) std 1 lug 98.43” (2.5 m)
640504	Lifter tube 250 Ø 9.84” (250 mm) std 1 lug 98.43” (2.5 m)
640514	Lifter tube 300 Ø 11.8” (300 mm) std 1 lug 98.43” (2.5 m)

Vacuum lifter 3 m

640461-03	Lifter tube 140 Ø 5.51” (140 mm) std 2 lug 118.11” (3 m)
640471-03	Lifter tube 160 Ø 6.30” (160 mm) std 2 lug 118.11” (3 m)
640481-03	Lifter tube 180 Ø 7.09” (180 mm) std 2 lug 118.11” (3 m)
640491-03	Lifter tube 200 Ø 7.87” (200 mm) std 2 lug 118.11” (3 m)
640499-03	Lifter tube 230 Ø 9.06” (230 mm) std 2 lug 118.11” (3 m)
640504-03	Lifter tube 250 Ø 9.84” (250 mm) std 2 lug 118.11” (3 m)
640514-03	Lifter tube 300 Ø 11.8” (300 mm) std 2 lug 118.11” (3 m)

Vacuum lifter 4 m

640461-04	Lifter tube 140 Ø 5.51” (140 mm) std 2 lug 157.48” (4 m)
640471-04	Lifter tube 160 Ø 6.30” (160 mm) std 2 lug 157.48” (4 m)
640481-04	Lifter tube 180 Ø 7.09” (180 mm) std 2 lug 157.48” (4 m)
640491-04	Lifter tube 200 Ø 7.87” (200 mm) std 2 lug 157.48” (4 m)
640499-04	Lifter tube 230 Ø 9.06” (230 mm) std 2 lug 157.48” (4 m)
640504-04	Lifter tube 250 Ø 9.84” (250 mm) std 2 lug 157.48” (4 m)
640514-04	Lifter tube 300 Ø 11.8” (300 mm) std 2 lug 157.48” (4 m)

Protection sock

Part # Designation

Vacuum lifter 2,5 m, black with logo

6040464	Protection sock, 140 Ø 5.51” (140 mm) 98.43” (2.5 m)
6050465	Protection sock, 160 Ø 6.30” (160 mm) 98.43” (2.5 m)
6050466	Protection sock, 180 Ø 7.09” (180 mm) 98.43” (2.5 m)
6050467	Protection sock, 200 Ø 7.87” (200 mm) 98.43” (2.5 m)
6050469	Protection sock, 230 Ø 9.06” (230 mm) 98.43” (2.5 m)
6050470	Protection sock, 250 Ø 9.84” (250 mm) 98.43” (2.5 m)
6050471	Protection sock, 300 Ø 11.8” (300 mm) 98.43” (2.5 m)

Vacuum lifter, black

640580-143	Protection sock, 140 Ø 5.51” (140 mm) 118.11” (3 m)
640580-163	Protection sock, 160 Ø 6.30” (160 mm) 118.11” (3 m)
640580-183	Protection sock, 180 Ø 7.09” (180 mm) 118.11” (3 m)
640580-203	Protection sock, 200 Ø 7.87” (200 mm) 118.11” (3 m)
640580-233	Protection sock, 230 Ø 9.06” (230 mm) 118.11” (3 m)
640580-253	Protection sock, 250 Ø 9.84” (250 mm) 118.11” (3 m)
640580-303	Protection sock, 300 Ø 11.8” (300 mm) 118.11” (3 m)

Vacuum lifter, black

640580-144	Protection sock, 140 Ø 5.51” (140 mm) 157.48” (4 m)
640580-164	Protection sock, 160 Ø 6.30” (160 mm) 157.48” (4 m)
640580-184	Protection sock, 180 Ø 7.09” (180 mm) 157.48” (4 m)
640580-204	Protection sock, 200 Ø 7.87” (200 mm) 157.48” (4 m)
640580-234	Protection sock, 230 Ø 9.06” (230 mm) 157.48” (4 m)
640580-254	Protection sock, 250 Ø 9.84” (250 mm) 157.48” (4 m)
640580-304	Protection sock, 300 Ø 11.8” (300 mm) 157.48” (4 m)

Plastic adapters

Part #	Designation
Plastic adapter, upper	
640346	Plastic adapter 140 Ø 5.51” (140 mm) upper
640347	Plastic adapter 160 Ø 6.30” (160 mm) upper
640348	Plastic adapter 180 Ø 7.09” (180 mm) upper
640349	Plastic adapter 200 Ø 7.87” (200 mm) upper
640350	Plastic adapter 230 Ø 9.06” (230 mm) upper
640351	Plastic adapter 250 Ø 9.84” (250 mm) upper
640352	Plastic adapter 300 Ø 11.8” (300 mm) upper
Plastic adapter, lower	
640366	Plastic adapter 140 Ø 5.51” (140 mm) lower
640367	Plastic adapter 160 Ø 6.30” (160 mm) lower
640368	Plastic adapter 180 Ø 7.09” (180 mm) lower
640369	Plastic adapter 200 Ø 7.87” (200 mm) lower
640370	Plastic adapter 230 Ø 9.06” (230 mm) lower
640371	Plastic adapter 250 Ø 9.84” (250 mm) lower
640372	Plastic adapter 300 Ø 11.8” (300 mm) lower

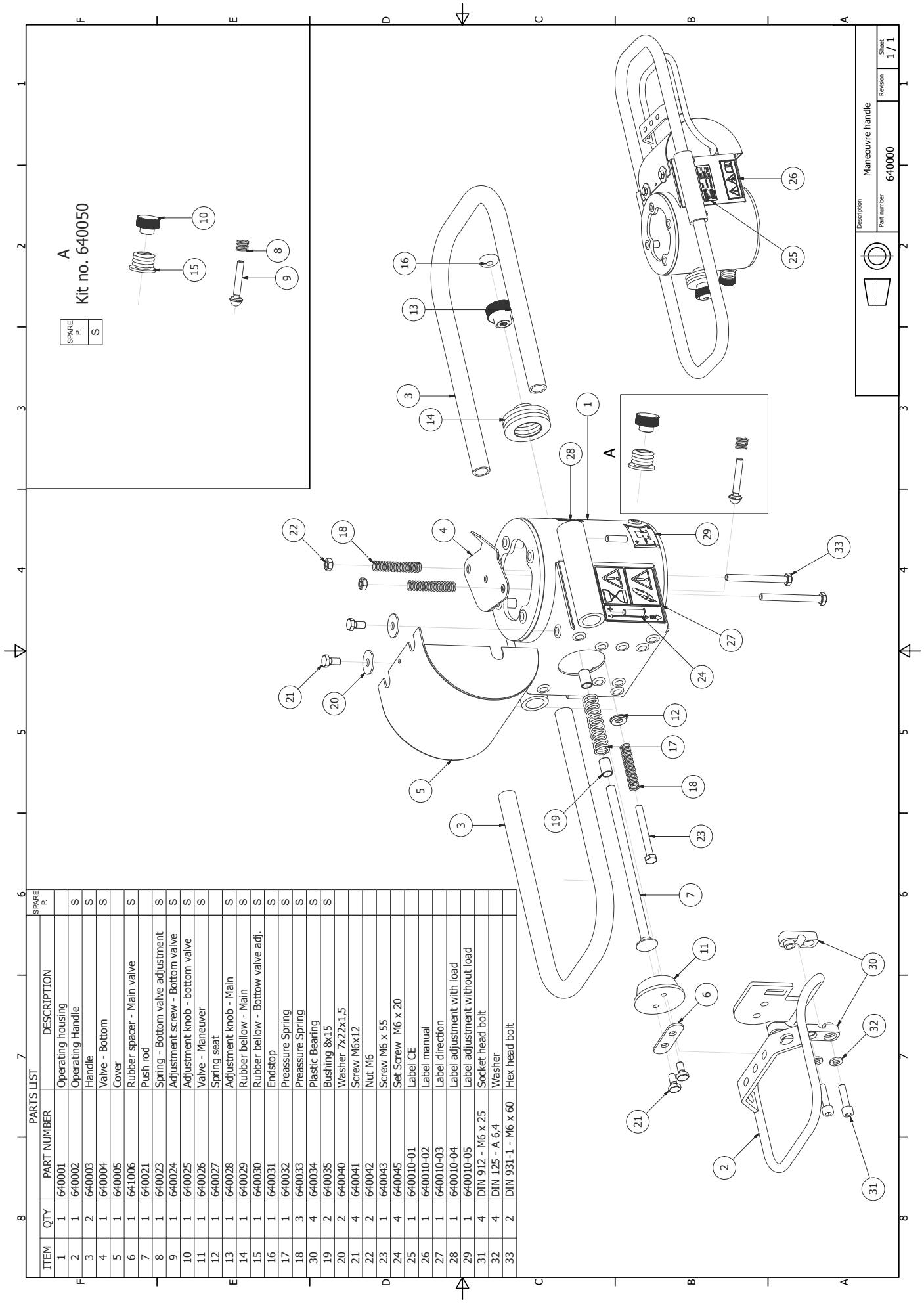
Swivels, complete

Part #	Designation
Swivel, top. 1 lug, complete	
640320-10	Swivel 140 Ø 5.51” (140 mm) 1 lug omplete
640321-10	Swivel 160 Ø 6.30” (160 mm) 1 lug complete
640322-10	Swivel 180 Ø 7.09” (180 mm) 1 lug complete
640323-10	Swivel 200 Ø 7.87” (200 mm) 1 lug complete
640324-10	Swivel 230 Ø 9.06” (230 mm) 1 lug complete
640325-10	Swivel 250 Ø 9.84” (250 mm) 1 lug complete
640326-10	Swivel 300 Ø 11.8” (300 mm) 1 lug complete
Swivel, top. 2 lug, complete	
640320-20	Swivel 140 Ø 5.51” (140 mm) 1 lug complete
640321-20	Swivel 160 Ø 6.30” (160 mm) 1 lug complete
640322-20	Swivel 180 Ø 7.09” (180 mm) 1 lug complete
640323-20	Swivel 200 Ø 7.87” (200 mm) 1 lug complete
640324-20	Swivel 230 Ø 9.06” (230 mm) 1 lug complete
640325-20	Swivel 250 Ø 9.84” (250 mm) 1 lug complete
640326-20	Swivel 300 Ø 11.8” (300 mm) 1 lug complete

Gasket

Part #	Designation
641003	Gasket

Drawings



PARTS LIST

ITEM	QTY	PART NUMBER	DESCRIPTION	SPARE P:
1	1	640001	Operating housing	
2	1	640002	Operating Handle	S
3	2	640003	Handle	S
4	1	640004	Valve - Bottom	S
5	1	640005	Cover	
6	1	641006	Rubber spacer - Main valve	S
7	1	640021	Push rod	
8	1	640023	Spring - Bottom valve adjustment	S
9	1	640024	Adjustment screw - Bottom valve	S
10	1	640025	Adjustment knob - bottom valve	S
11	1	640026	Valve - Maneuver	S
12	1	640027	Spring seat	
13	1	640028	Adjustment knob - Main	S
14	1	640029	Rubber bellow - Main	S
15	1	640030	Rubber bellow - Bottow valve adj.	S
16	1	640031	Endstop	S
17	1	640032	Preassure Spring	S
18	3	640033	Preassure Spring	S
19	4	640034	Plastic Bearing	S
20	2	640035	Bushing 8x15	S
21	4	640040	Washer 7x22x1,5	
22	2	640041	Screw M6x12	
23	1	640042	Nut M6	
24	4	640043	Screw M6 x 55	
25	1	640045	Set Screw M6 x 20	
26	1	640010-01	Label CE	
27	1	640010-02	Label manual	
28	1	640010-03	Label direction	
29	1	640010-04	Label adjustment with load	
31	4	640010-05	Label adjustment without load	
32	4	DIN 912 - M6 x 25	Socket head bolt	
33	2	DIN 125 - A 6,4	Washer	
		DIN 931-1 - M6 x 60	Hex head bolt	

EC declaration of conformity of the machinery

TRANSLATION
(according to 2006/42/EG, annex 2A)

Manufacturer
RonI, Inc
8001 Tower Point Drive
Charlotte, NC 28227
USA

Local Tel: +704-847-2464
Toll Free Tel: +866-543-8635
Fax: +866-543-9532
E-mail: +Info@RonI.com
Web: +www.RonI.com

Representative for documentation
Krister Johnsson
Movomech AB

hereby declares that the machinery

Designation
Vacuhand Pro

Machine type
Vacuum lifter

Version
140/160/180/200 (F) Pump BE 2,2 kW
140/160/180/200/230/250/300 (G) Pump BE 4,0 kW
180/200/230/250/300 (H) Pump BE 7,0 kW

and that standards and/or technical specifications as described below are applied

☒ **Machinery Directive 2006/42/EC**

☒ **EMC Directive 2014/30/EU**

☒ **Low Voltage Directive 2014/35/EU**

and that standards and/or technical specifications as described below are applied.

☒ **Machinery Directive**
SS-EN-ISO 12100:2010
SS-EN 14238:2004 + A1:2009

☒ **EMC Directive**

☒ **Low Voltage Directive**
IEC 60204-32
IEC 60204-1

Place: Kristianstad **Date:** 2021-01-01

Krister Johnsson, Managing Director
Movomech AB

LIFT-O-FLEX
MOBI-Crane | movomech | Voyager

Vacuum Pump

Table of Contents

1 Safety

Prior to handling the machine, this instruction manual should be read and understood.

Read this manual carefully before use and keep for future reference.

This instruction manual remains valid as long as the customer does not change anything on the product.

The machine is intended for industrial use. It must be handled only by technically trained personnel.

Always wear appropriate personal protective equipment in accordance with the local regulations.

The machine has been designed and manufactured according to state-of-the-art methods. Nevertheless, residual risks may remain. This instruction manual highlights potential hazards where appropriate. Safety notes and warning messages are tagged with one of the keywords DANGER, WARNING, CAUTION, as follows:

DANGER

... indicates an imminent dangerous situation that will result in death or serious injuries if not prevented.

WARNING

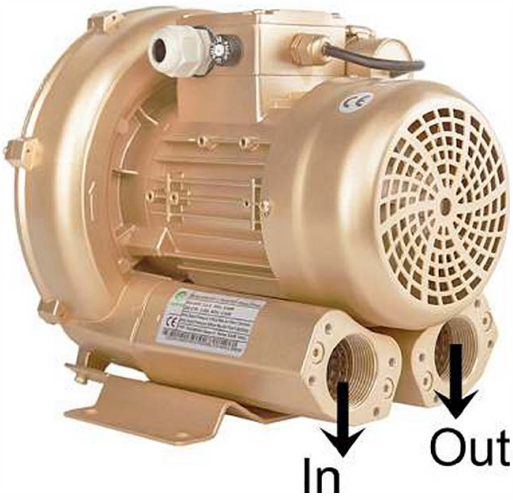
... indicates a potentially dangerous situation that could result in death or serious injuries.

CAUTION

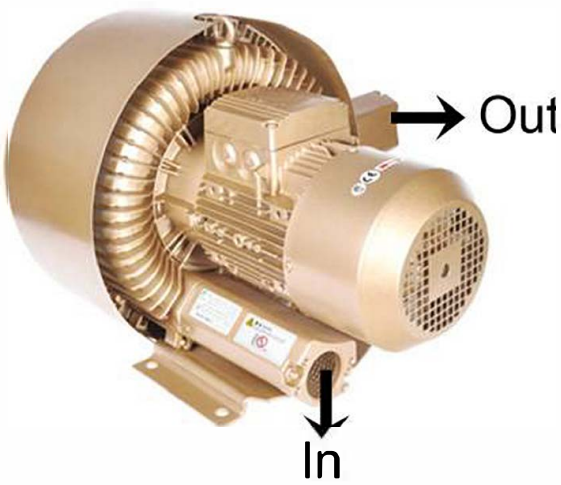
... indicates a potentially dangerous situation that could result in minor injuries.

2 Product Description

Single-stage



Double- stage



IN Suction connection

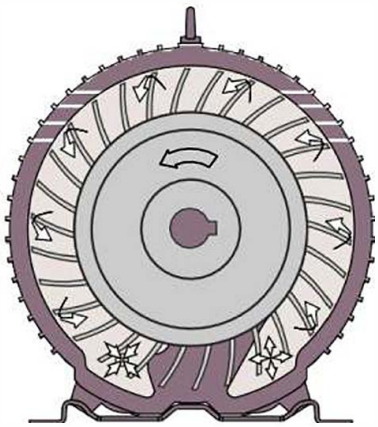
OUT Discharge connection

NOTE

Technical term.

In this instruction manual, we consider that the term 'machine' refers to the 'side channel blower.

2.1 Operating Principle



The machine works on the impulse principle, i.e. Kinetic energy is transferred from the impeller to the conveyed medium and then is converted into pressure.

The change in pressure is made without the use of any lubrication whatsoever.

NOTICE

Lubricating a dry running machine (process chamber).

Risk of damage to the machine!

- Do not lubricate the process chamber of the machine with oil or grease.

2.2 Application

The machine is intended for the suction and/or compression of air and other dry, non-aggressive, non-toxic, non-flammable and non-explosive gases.

Conveying of other media leads to an increased thermal and/or mechanical load on the machine and is permissible only after a consultation.

The machine is intended for the placement in a non-potentially explosive environment.

The machine is not capable of maintaining ultimate pressure. The minimum allowed ulti- mate pressure is to be read from the nameplate of the machine.

By means of process control and/or vacuum relief valves it must be made sure that the minimum allowed ulti- mate pressure will not be under run.

Permitted environmental conditions, see Technical Data [▶ 16].

2.3 Optional Accessories

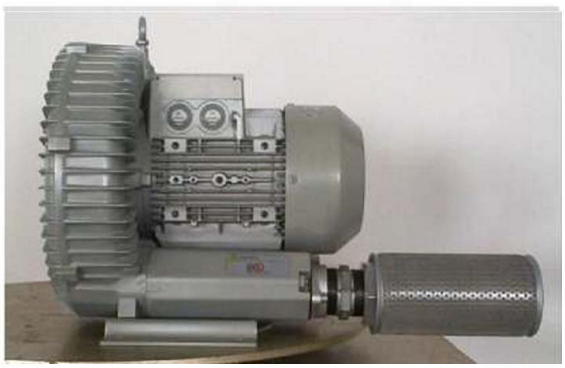
2.3.1 Pressure relief Valve

The pressure relief valve controls inlet pressure when the machine is used on vacuum duties.

The pressure regulating valve controls pressure when the machine is used on overpressure duties.

2.3.2 Inlet Filter

The inlet filter protects the machine against dust and other solids in the process gas. The inlet filter is available with a cartridge.

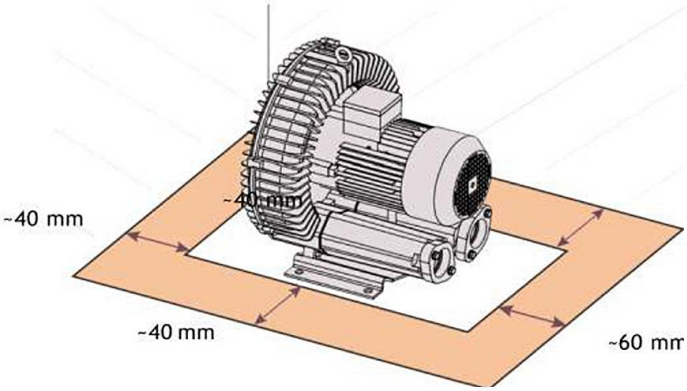


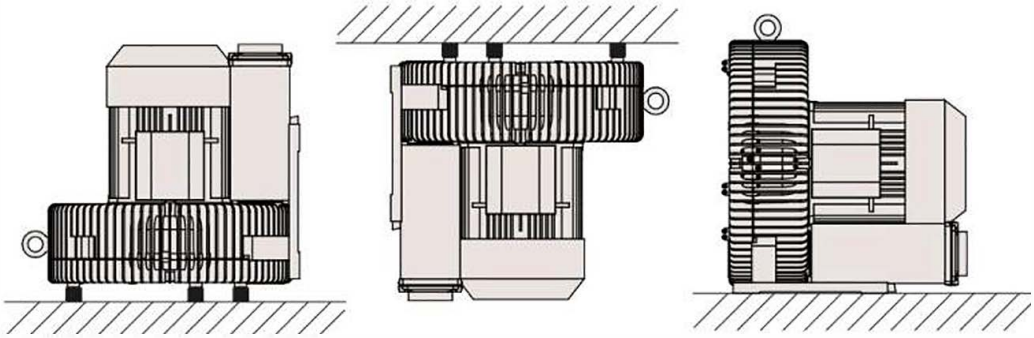
2.3.3 Silencer

A silencer at the discharge connection (OUT) can be provided to reduce the exhaust gas noise.

3 Installation

3.1 Installation Conditions





- Make sure that the environment of the machine is not potentially explosive.
- Make sure that the ambient conditions comply with the Technical Data [▶ 16].
- Make sure that the environmental conditions comply with the protection class of the motor.
- Make sure that the installation space or location is vented such that sufficient cooling of the machine is provided.
- Make sure that cooling air inlets and outlets are not covered or obstructed and that the cooling air flow is not affected adversely in any other way.
- Make sure that the machine is placed or mounted horizontally/vertically, with a maximum deviation of 1° in any direction.
- Make sure that the machine is placed or mounted horizontally on a flat surface.
- Make sure that all provided covers, guards, hoods, etc. are mounted.

If the machine is installed at an altitude greater than 1000 meters above sea level:

- Contact your sales representative, the motor should be derated or the ambient temperature limited.

If the machine is installed outdoor:

- Provide a protective cover against the weathering effects.

3.2 Connecting Lines / Pipes

- Remove all protective caps beforeinstallation.
- Make sure that theconnection lines cause no stress on the machine's connection; if necessary use flexible joints.
- Make sure that the line size of the connection lines over the entire length is at least as large as the connections of themachine.

In case of very long connection lines it is advisable to use larger line sizes in order to avoid a loss of efficiency. Seek advice from your sales representative.

3.2.1 Suction Connection

NOTICE

Intruding foreign objects or liquids.

Risk of damage to the machine!

If the inlet gas contains dust or other foreign solid particles:

- Install a suitable filter (5 micron or less) upstream from the machine.

3.2.2 Discharge Connection

Depending on the specific order, other connection dimensions may apply.

- Make sure that the discharged gas will flow without obstruction. Do not shut off or throttle the discharge line.

3.3 Electrical Connection

DANGER

Live wires.

Risk of electrical shock.

- Electrical installation work must only be executed by qualified personnel.

- Make sure that the power supply for the motor is compatible with the data on the nameplate of the motor.
- Provide overload protection according to EN 60204-1 for the motor.
- Make sure that themotor of the machine will not be affected by electric or electro-magnetic disturbance from the mains; if necessary seek advice from your sales representative.
- Connect the protective earth conductor.
- Electrically connect the motor.

NOTICE

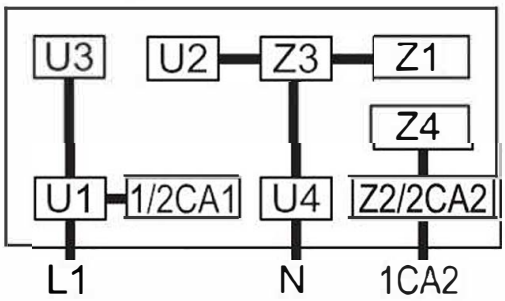
Incorrect connection.

Risk of damage to the motor!

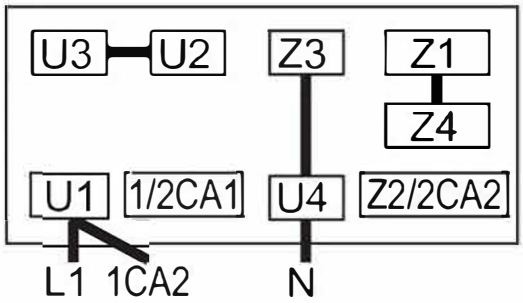
- The wiring diagrams given below are typical. Check the inside of the terminal box for motor connection instructions/diagrams.

3.3.1 Wiring Diagram Single-Phase Motor

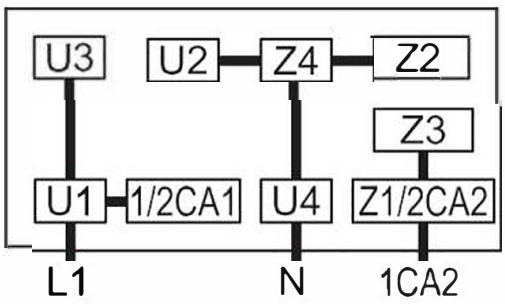
Low voltage:



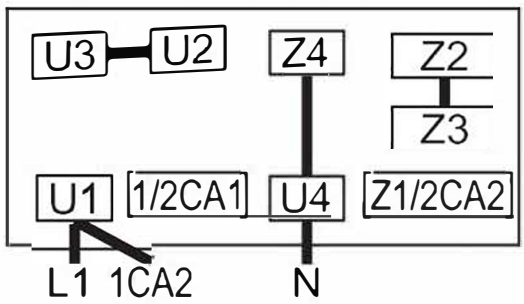
High voltage:



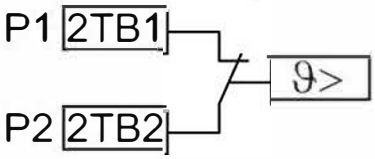
Low voltage (with motor protection):



High voltage (with motor protection):



Connection motor protection:



3.3.2 Wiring Diagram Three-Phase Motor

NOTICE

Incorrect direction of rotation.

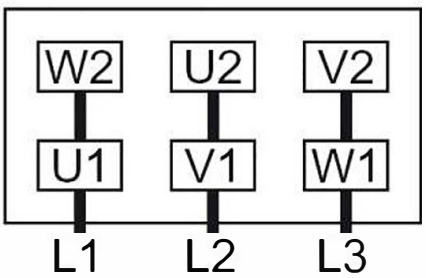
Risk of damage to the machine!

- Operation in the wrong direction of rotation can destroy the machine in a short time! Prior to start-up, ensure that the machine is operated in the right direction.

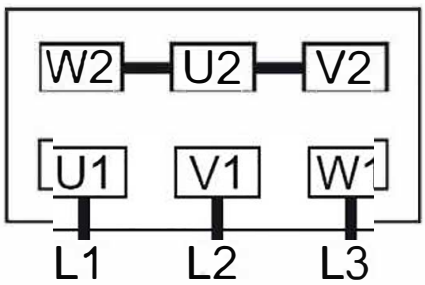
If the rotation of the motor must be changed:

- Switch any two of the motor phase wires.

Delta connection (low voltage):



Star connection (high voltage):



4 Commissioning

NOTICE

Lubricating a dry running machine (process chamber).

Risk of damage to the machine!

- Do not lubricate the process chamber of the machine with oil or grease.

CAUTION

During operation the surface of the machine may reach temperatures of more than 70°C.

Risk of burns!

- Avoid contact with the machine during and directly after operation.

CAUTION

Noise of running machine.

Risk of damage to hearing!

If persons are present in the vicinity of a non noise insulated machine over extended periods:

- Make sure that ear protection is being used.

- Make sure that the installation conditions (see Installation Conditions [▶ 7]) are complied with.
- Switch on the machine.
- Make sure that the maximum permissible number of starts does not exceed 6 starts per hour.
- Make sure the working/pause periods are equal with multiple starts per hour.

As soon as the machine is operated under normal operating conditions:

- Measure the motor current and record it as reference for future maintenance and trouble shooting work.

5 Maintenance

WARNING

Machines contaminated with hazardous material.

Risk of poisoning!

Risk of infection!

If the machine is contaminated with hazardous material:

- Wear appropriate personal protective equipment.

CAUTION

Hot surface.

Risk of burns!

- Prior to any action requiring touching the machine, let the machine cool down first.

- Shut down the machine and lock against inadvertent start up.
- Vent the connected lines to atmospheric pressure.

If necessary:

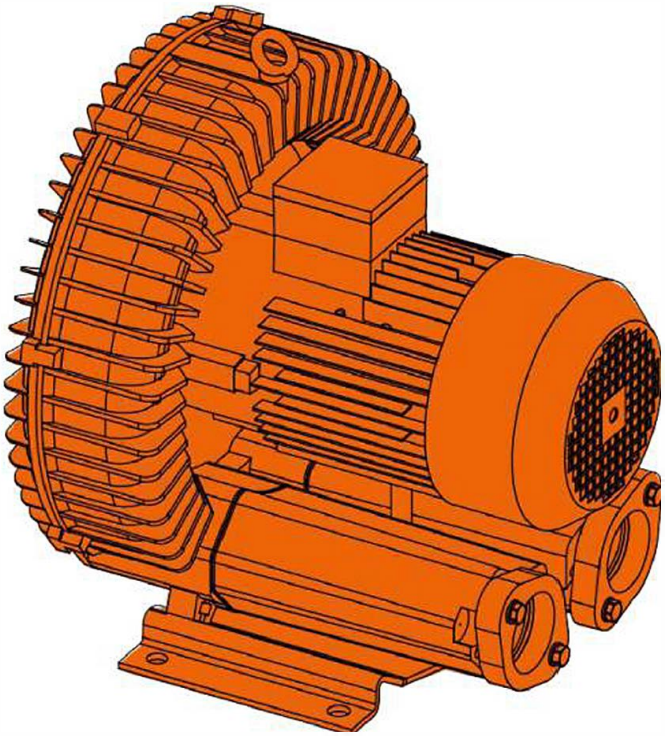
- Disconnect all connections.

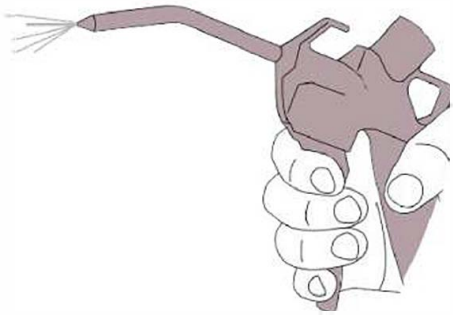
5.1 Maintenance Schedule

The maintenance intervals depend very much on the individual operating conditions. The intervals given below are desired to be considered as starting values which should be shortened or extended as appropriate. Particularly heavy duty operation, such as high dust loads in the environment or in the process gas, other contamination or ingress of processmaterial, can make it necessary to shorten themaintenance intervals significantly.

Interval	Maintenance work
Monthly	• Clean the machine from dust and dirt. in case of an inlet filter being installed: • Check the inlet filter cartridge, replace if necessary.
Every 6 months	• Clean the machine from dust and dirt. • Make sure that the electronic components and the cooling fan are free from dust.
Yearly	• Carry out a visual inspection and clean the machine from dust and dirt. • Check the electrical connections and the monitoring devices. • Clean the inlet and outlet silencer.
Every 5 years	• Have a major overhaul on the machine (contact your sales representative).

5.2 Cleaning from Dust and Dirt





Clean the ventilation grilles and cooling fins

6.Overhaul

NOTICE

Improper assembly.

Risk of premature failure!

Loss of efficiency!

- It is highly recommended that any dismantling of the machine that goes beyond any-thing that is described in this manual should be done by the manufacturer.

WARNING

Machines contaminated with hazardous material.

Risk of poisoning!

Risk of infection!

If the machine is contaminated with hazardous material:

- Wear appropriate personal protective equipment.

In case of the machine having conveyed gas that was contaminated with foreign materials which are dangerous to health:

- Decontaminate the machine as well as possible and state the contamination status in a 'Declaration of Contamination'.

7 Decommissioning

- Shut down the machine and lock against inadvertent start up.
- Vent the connected lines to atmospheric pressure.
- Disconnect all connections.

If the machine is going to be stored:

- See Storage [▶ 6].

7.1 Dismantling and Disposal

- Separate special waste from the machine.
- Dispose of special waste in compliance with applicable regulations.
- Dispose of the machine as scrap metal.

8 Spare Parts

NOTICE

Use of non-manufacturer genuine spare parts. **Risk of premature failure!**

Loss of efficiency!

- The exclusive use of genuine spare parts and consumables is recommended for the proper function of the machine and for granting of warranty.

Commercially available standard parts are to be purchased on the open market.

If other parts are required:

- Contact your sales representative for the detailed spare parts and accessory list.

9.Troubleshooting

DANGER

Live wires.

Risk of electrical shock.

- Electrical installation work must only be executed by qualified personnel.

CAUTION

Hot surface.

Risk of burns!

- Prior to any action requiring touching the machine, let the machine cool down first.

Problem	Possible cause	Remedy
The machine does not start.	At least two power supply leads are interrupted	• Check the fuses, terminals and power supply cables
	The motor is not supplied with the correct voltage.	• Check the power supply.
	The motor is defective.	• Repair the machine (contact us).
The machine does not start; humming noise.	One power supply lead is interrupted	• Check the fuses, terminals and power supply cables
	Impeller defective	• Replace impeller
	Impeller is jammed	• Open the cover, remove foreign body and clean.
		• Check the impeller gap.
	Bearing on motor side machine side is defective	• Replace defective bearing.
Motor protective switch trips when starting the machine. Power consumption is too high.	Winding short-circuit	• Check the winding.
	Motor overloaded.	• Reduce throttling.
	Throttling does not match specification on rating plate	• Clean filters, mufflers and connecting pipes.
	Compressor is jammed.	• See The machine does not start; humming noises [▶ 14].
The machine runs very noisily.	The machine runs in the wrong direction	• Check the direction of rotation.
	Bearings lacking grease	• Relubricate or replace if necessary.
	Defective bearings.	• Repair the machine (contact us).
The machine runs with abnormal flow noises.	The flow speed is too high	• Use larger sized pipes.
	The silencers are soiled.	• Check silencer inserts, cleanor replaceif necessary.

The machine does not reach the usual pressure on the suction connection.	Suction or discharge lines too long or section diameter too small.	• Use larger diameter or shorter lines. • Seek advice from your local sales representative.
	The machine runs in the wrong direction.	• Check the direction of rotation, see Wiring Diagram Three-Phase Motor
	Different density of conveyed medium	• Take conversion of pressure value into account. Contact us if neces sary.
	Change in blade profile due soiling.	• Check the impeller, clean or replace if necessary.
	In case an inlet screen is installed: The inlet screen is partially clogged.	• Clean the inlet screen.
	In case a vacuum relief valve is installed: The vacuum relief valve is misadjusted or defective.	• Replace the vacuum relief valve.
	In case an inlet filter valve is installed: The inlet filter cartridge is partially clogged.	• Replace the inlet filter cartridge.
	Leak in the system.	• Repair leak.
	Internal parts are worn or damaged.	• Repair the machine (contact us).
The machine runs too hot.	Insufficient cooling.	• Remove dust and dirt from the machine.
	Ambient temperature too high.	• Observe the permitted ambient temperature.
Compressor leaky.	Seals on silencer defective.	• Check silencer seals and replace if necessary
	Seals in motor area defective.	• Check motor seals and replace if necessary

For the solution of problems not mentioned in the troubleshooting chart contact your sales representative.