

TAWI

User manual for TAWI Multifunctional lifter ATEX



This is the original version of the TAWI Multifunctional lifters ATEX user manual.

EC DECLARATION OF CONFORMITY OF THE MACHINERY

Original

Directive 2006/42/EC, Annex II, A

TAWI

Manufacturer:

Business name: TAWI AB

Address: Transportgatan 1, 434 23 Kungsbacka, Sweden

Hereby declares that:

Type of machinery: ***Vacuum Tube Lifter***

Product name:

VMEx30, VMEx40, VMEx50, VMEx60, VMEx80, VMEx100, VMEx120, VMEx180, VMEx270

Complies with the requirements of Machinery Directive 2006/42/EC

Complies with the requirements of ATEX Directive 2014/34/EU

Complies also with applicable requirements of the following EC directives:

2014/30/EU

2011/65/EU (RoHS)

The following other standards and specifications have been applied:

EN ISO 14238:2004

EN ISO 12100:2010

SS-EN 13463-1:2009

SS-EN 13463-5:2011

SS-EN 1127-1:2011

ATEX Marking Vacuum Tube Lifter:

II 2GD Ex c IIB T6/T85°C Gb/Db

Person authorized to compile the technical file:

Name: David Ranfalk

Business name: TAWI AB

Address: Transportgatan 1, 434 23 Kungsbacka, Sweden

This declaration is applicable only if the product(s) has/have been installed according to TAWI's instructions and provided that the product(s) has/have not been modified in any way.

Signature:

Place and date: **Kungsbacka 2021-02-01**



Name: **Thomas Bräutigam**

Position: **President Lifting Automation Division**

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1 Safety & important information

This chapter presents safety information about the TAWI Multifunctional lifters ATEX (hereafter referred to as lifters). Some of the information is divided in Warning, Caution and Important. This division is based on the severity of the consequences that may occur if the instructions are not followed. Stickers and labels are explained in this chapter and information is provided about directives that TAWI follows.

This manual and the Declaration of conformity is only valid when using TAWI authorised tools.

ATEX approved articles from TAWI AB are stated in appendix IV.

Work zones up to: EX zones: 1, 21, 2 and 22

Resistance check: Once quarterly by an authorised electrician.

For further information on ATEX zones, see *page 16*.

For a fully approved ATEX system, only approved components can be used to complete the machine. A full list of approved components can be found in *Chapter 9*.



WARNING: Risk of personal injuries or major material damages.



Caution: Risk of material damages.



Important: Important information is highlighted.



WARNING

- Before operating a lifter, this manual must be read and understood.
- NEVER exceed the indicated max load capacity on the lifter or on a tool.
- Make sure loads are distributed evenly under the tool.
- Stay clear of the area underneath the lifter at all times.
- Stay clear of moving parts.
- In order to deal with the lifter's cables and wiring, a good knowledge of electricity and TAWI electrical schedules of the lifters is required. Faults can cause damage to people and property.
- A new resistance test is required with every change executed.
- Service, test and reparation shall take place when the environment is non explosive.
- NEVER hang in the lifter.



Caution

- The lifters are made for use under a roof protected from wind and rain.
- Make sure there is good lighting in areas where the lifter is operated.
- Keep clean. Never spray or pour water onto any part of the vacuum pump or electrical cables.
- Any part of this lifter or accessories that show signs of wear or other damage must be replaced immediately. The lifter must not be used before the damaged part is replaced.
- Only run the lifter when it is completely assembled.
- Wear steel toe shoes with good grip when operating the lifter.



Important

- To prevent damages and injuries caused by improper use and not to compromise the warranty and liability: Follow the instructions in this manual at all times!
- Use the lifter or accessories only in accordance with all instructions in this manual.
- Keep this manual accessible to all staff.
- The lifters are not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience or knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Children should be supervised to ensure that they do not play with the lifters.
- Use only TAWI Multifunctional lifters ATEX original spare parts.
- Always follow any local/national recommendations as well as the instructions in this manual.
- The lifter and accessories should only be used when they are in perfect working order.
- The lifters max load capacity has been tested with 10% dynamic overload and 25% static overload.

WEEE, RoHS and REACH



TAWI follows the WEEE (Directive 2012/19/EU), RoHS (2002/95/EC) and REACH (EC 1907/2006) regulations.

All parts can be discarded and assorted for recycling.

Do not make modifications

Welding and other mechanical modifications to the lifters or accessories must be carried out by TAWI authorised staff. If TAWI is no longer in business and there is no successor interested in the business, the user may perform a modification/alteration to a lifter. If this is done, the modification/alteration must be designed, tested and implemented by experts in TAWI Multifunctional lifters ATEX lifters and their safety. Also, a permanent record of the design, test(s) and implementation of the modification/alteration must be maintained. Appropriate changes to the capacity decals, tags and user manual must be made, see *Markings and labels on the lifters*. A permanent and visible label must be fastened on the lifter that states how the lifter has been modified/alterated together with the date it was performed. The name and address of the organisation that performed the modification must also be included.

Markings and labels on the TAWI Multifunctional lifters ATEX

Identification plate, lifter

TAWI		CE
Model:	MRC:	
Serial no.:	Net weight:	
Production year:	Vacuum:	
TAWI AB Transportgatan 1/Box 10205 SE-434 23 Kungsbacka SWEDEN		www.tawi.com info@piab.com

Identification plate, tool

TAWI		CE
Article:	Net weight:	
Serial no.:	Prod. year:	
TAWI AB Transportgatan 1 Box 10205 SE-434 23 Kungsbacka SWEDEN		www.tawi.com info@piab.com

Identification plate, pump

TAWI		year
Transportgatan 1 SE-434 37 Kungsbacka www.tawi.se		No
CE	type	
	frequency	Hz
	speed	min ⁻¹
	power required	kW
	inlet capacity	m ³ /h
	pressure +	mbar
vacuum -	mbar	
WN88.2-37		
		Made in Germany

Special markings and labels on TAWI Multifunctional lifter ATEX

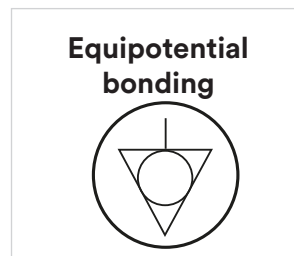
IMPORTANT!

The TAWI Multifunctional lifter ATEX top swivel **MUST BE** installed in an ATEX-certified system and the complete system must be grounded. This installation must only be carried out by an authorised electrician.



Illustration: the upper part of the TAWI Multifunctional lifter ATEX with earth cable.


1. Connect the cable clip of the earth cable from the TAWI Multifunctional lifter ATEX unit to the crane system/jib crane trolley.
 2. If a jib crane is used: connect the jib profile to the column and again from there to an earthed point.
 3. If a crane system is used with two or more tracks/gantry profiles: connect the crane/bridge suspension to the gantry/track trolley; attach the cable clips in both ends of the cable with screws.
 4. Connect a gantry/track suspension to an earthed point.
 5. Carry out the same procedure, point 3)-4) on all tracks/gantry profiles in the system.
- All earthed wires must be inspected regularly. Check for signs of wear and make sure all connections are secure.
 - On a regular, quarterly basis the earthing of the system must be checked by an authorized electrician or TAWI-representative. Measure the resistance between any point on the suction foot and the lift units grounded connection on the ejector suspension. To ensure that static electricity passes through the lift unit, the resistance must not exceed 100 Ohm.
 - Do not wipe down the lift tube with cloth or similar that can induce static electricity.
 - Any manipulation or replacing of parts on this lift unit may only be carried out by TAWI-representatives and the resistance of the system must be checked immediately after.
 - Use only TAWI original parts.
 - These instructions are to be followed in addition to the manual for the lift unit and the crane system/jib crane.




The system must be completely grounded before the TAWI Multifunctional lifter ATEX is taken into service.

Labels on TAWI Multifunctional lifter ATEX




 Read manual instructions!
The operator must read and understand this manual before using the lifter.




 Warning! Take precaution!




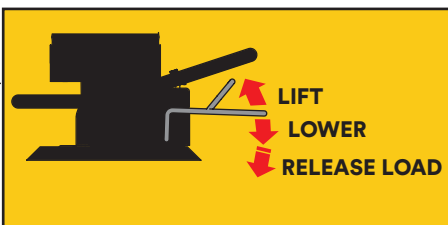
 Warning for hot air! Burn hazard.




 Warning for electrical shock!




 Warning! Stand clear of moving parts!

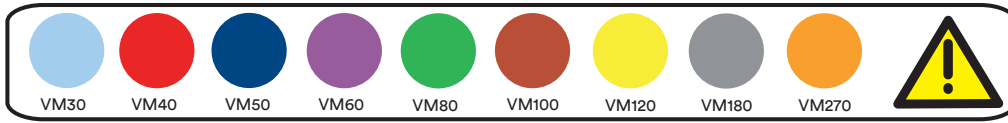


 This symbol shows operator handle use.
Read the manual before using the lifter!



 This symbol precedes stated max load capacity. Never exceed the indicated max load capacity!

Colour code system



Warning! Note the colour code system for safe assembly of lift unit to suction foot/accessory. Each color corresponds to a specific TAWI Multifunctional lifter ATEX model. **ONLY PARTS WITH MATCHING COLOUR CODE MARKING MAY BE ASSEMBLED!** Some suction feet/accessories may be used with several lift models (indicated by the colour code). Incorrect combinations of lift unit and accessory may cause serious injuries.

Grounding



It is important to read through and follow the instructions in this manual before the TAWI Multifunctional lifter ATEX system is put into service. Note that all other equipment in the potentially explosive environment must be intended for use in the explosive environment to avoid the danger of explosion.

Resistance test



The most important factor for a substantial explosion protection is the grounding condition of the equipment. Check the resistance between the suction foot and column's grounding point with an adequate ohmmeter. The resistance between the suction foot and the column should not exceed 100 ohms. TAWI recommend logging the test value in a log book to check resistance over time and be able to take action to reduce the resistance.

Log the resistance value in Appendix III.

2 Warranty

This chapter presents warranty information about the TAWI Multifunctional lifters ATEX.

If a lifter is used according to all instructions in this manual it will perform well for many years. TAWI offers a one year limited guarantee, excluding transportation charges, provided that the lifter has been used under normal working conditions and in accordance with the instructions in this manual. Non compliance with rules and instructions in this manual will result in complete exclusion of TAWI's liability.

Please contact your TAWI representative for further information.

The guarantee is twelve months when employed in one shift (eight hours per day). On two shift or more intensive operation the guarantee period is reduced accordingly. Only valid with original parts and when all instructions in this manual have been followed.

With reference to this manual TAWI declines any responsibility in case of:

- Use of the machine contrary to national safety and accident prevention laws.
- Incorrect choice of the building site or buildings in which the machine is to be operated.
- Lack of or incorrect observation of the instructions supplied in this manual.
- Non-authorized modifications to the machine.
- Use of the machine by untrained or unsuitable staff.

To be able to use the warranty, the customer must scrupulously follow the instructions indicated in this manual, and in particular:

- Always work within the operational limits described in this manual.
- Follow maintenance and service procedures carefully.
- Appoint operators of proven capability, who have been adequately trained for the job.
- Use original parts indicated by the manufacturer only.

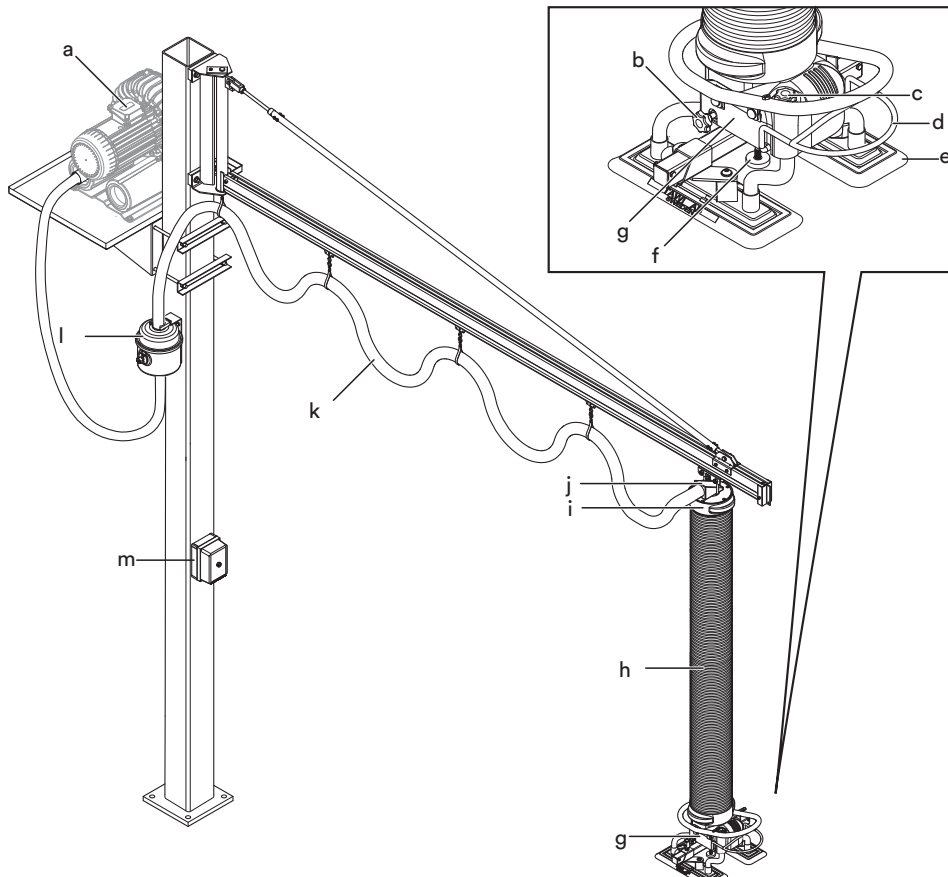
3 Overview

TAWI Multifunctional lifters ATEX is a line of lifters that lift and lower loads using vacuum. TAWI Multifunctional lifters ATEX provide lifting and transportation aid for loads up to 270 kg and can be equipped with different tools and accessories.

The lifters are currently available in nine different models, mainly differing in lifting capacity and tube area: VMEx30/40/50/60/80/100/120/180/270. This chapter presents an overview illustration of the lifters and a table containing characteristics of the different models.



- The VMEx60 model is used for all illustrations in this manual. Your model may differ in appearance.
- Mounting the pump on a pump shelf is optional.
- Silencing hood is NOT available for ATEX.



- | | |
|--|-----------------|
| a. Vacuum pump | g. Suction head |
| b. Load balance adjustment screw (no load) | h. Lift tube |
| c. Load balance adjustment screw (with load) | i. Top swivel |
| d. Operating handle | j. Safety valve |
| e. Suction foot | k. Air hose |
| f. Touch bolt | l. Filter unit |
| | m. Main switch |

Electric ATEX pump

This table presents information about each model.

Model	VMEx30	VMEx40	VMEx50	VMEx60	VMEx80	VMEx100
Lifting capacity (kg)	20	30	45	60	75	90
Lift tube ø (mm)	100	120	140	160	180	200
Stroke (mm)	1800/2600	1800/2600	1800/2600	1800/2600	1800/2600	1700/2400
Lift tube length (mm)	2500/4000	2500/4000	2500/4000	2500/4000	2500/4000	2500/4000
Noise level, Idle (dB)	N/A	N/A	N/A	N/A	N/A	N/A
Noise level, In operation (dB)	N/A	N/A	N/A	N/A	N/A	N/A

Model	VMEx120	VMEx180	VMEx270
Lifting capacity (kg)	120	140	200
Lift tube ø (mm)	230	250	300
Stroke (mm)	1700/2400	1500	1500
Lift tube length (mm)	2500/4000	2500	2500
Noise level, Idle (dB)	N/A	N/A	N/A
Noise level, In operation (dB)	N/A	N/A	N/A

Up and down motions	Variable speed - max 1 m/s (adjustable for light loads).
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The max lifting capacity specified above are valid for standard configurations of the lifters. Check the sticker on the lifter for applicable max load.

Ejector ATEX pump

This table presents information about each model.

Model	VMEx30	VMEx40	VMEx50	VMEx60	VMEx80	VMEx100
Lifting capacity (kg)	30	40	50	60	80	100
Lift tube ø (mm)	100	120	140	160	180	200
Stroke (mm)	1800/2600	1800/2600	1800/2600	1800/2600	1800/2600	1700/2400
Lift tube length (mm)	2500/4000	2500/4000	2500/4000	2500/4000	2500/4000	2500/4000
Noise level, Idle (dB)	N/A	N/A	N/A	N/A	N/A	N/A
Noise level, In operation (dB)	N/A	N/A	N/A	N/A	N/A	N/A

Model	VMEx120	VMEx180	VMEx270
Lifting capacity (kg)	120	180	270
Lift tube ø (mm)	230	250	300
Stroke (mm)	1700/2400	1500	1500
Lift tube length (mm)	2500/4000	2500	2500
Noise level, Idle (dB)	N/A	N/A	N/A
Noise level, In operation (dB)	N/A	N/A	N/A

Up and down motions	Variable speed - max 1 m/s (adjustable for light loads).
---------------------	--



The max lifting capacity specified above are valid for standard configurations of the lifters. Check the sticker on the lifter for applicable max load.

Vacuum equipment in ATEX area

The explosive atmosphere in form of dust or gas surrounding the object to be lifted will be sucked into the vacuum system and through tubes, filter and pump.

It's important to carefully plan selection and placement of each component and have in mind that every component will be affected, even though it might not be within the ATEX zone.

The placement of the vacuum pump is more significant for an ATEX vacuum system than for a normal vacuum system. This is because the pump is blowing out the air and explosive atmosphere pulled in at the suction cup.



Carefully plan the placement of each component. Each component will be affected even though it is not within the ATEX zone. The explosive atmosphere surrounding the object to be lifted will be sucked into the vacuum system.

4 Installation

This chapter presents how to install the lifter and adjust the load balance before first use. Plan the dimensions of the crane system or jib crane so that you can work with the vacuum lifter over the whole handling area. Remember that a jib crane is more effective if the lifting equipment is more often used at the outer part of the jib arm.

Important for ATEX installation

On installation of an ATEX system every component of the system needs to be grounded to prevent a static electricity ignition. The TAWI Multifunctional lifter ATEX unit is pre-wired with earth cables at delivery.

There are a few connection points in a complete system that can't be pre-wired from factory. At these points, the installation team are required to carry out the extra steps required for ensure the system are grounded.



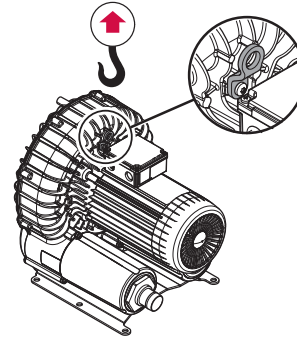
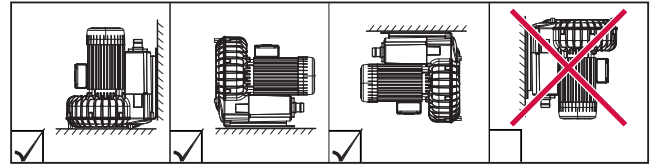
- Installation of main switch and motor circuit breaker must only be carried out by an authorised electrician.
- Use only ATEX certified equipment.



- Do not use more than 30m air hose. With a long air tube, the pump will work harder, which will generate more heat of the pump.
- Use anti static air hose. To prevent the air hose from generating static electricity, air hose with anti static characteristics should be used as much as possible.
- Use stainless steel components for best possible conductive properties.
- Watch out for collision between stainless steel and aluminum, collision between these materials have a big risk of causing ignition.

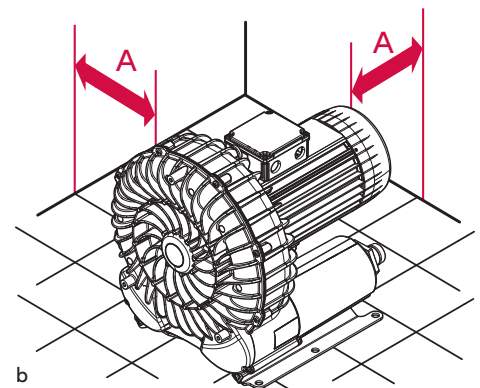
Install vacuum pump

1. Mount the vacuum pump in a suitable position (a). Only use the eyebolt for lifting.



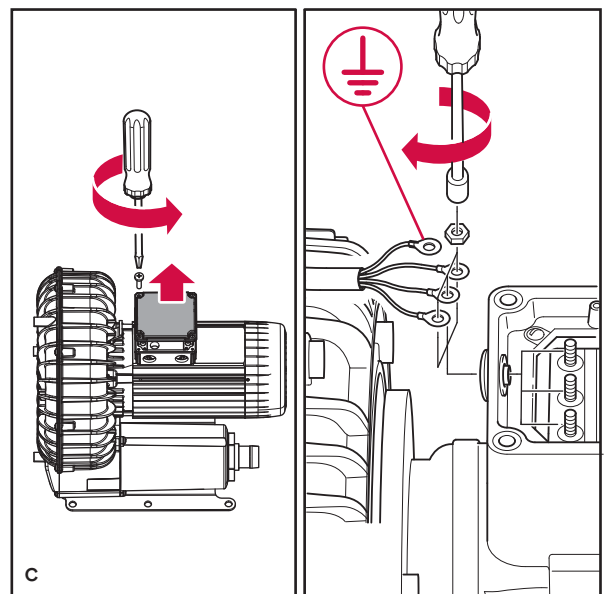
a

2. Make sure to install the pump so that it is provided with sufficient air flow ($A > 100$ mm) (b).



b

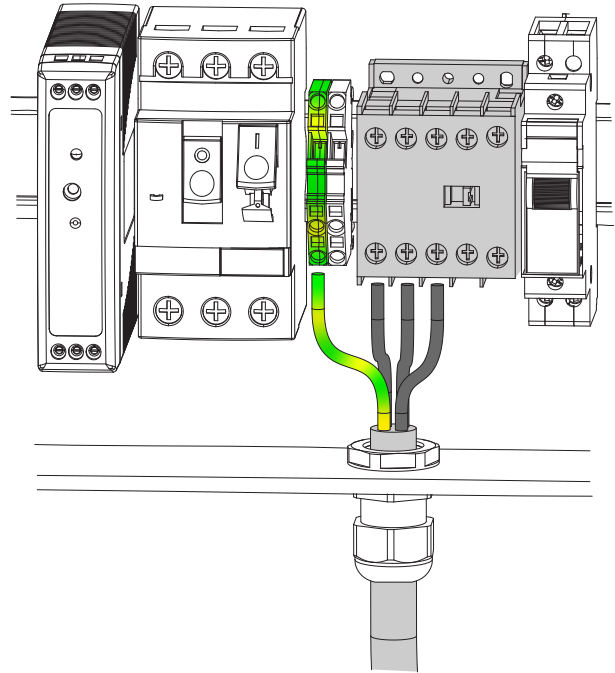
3. Connect the vacuum pump power supply (c). A motor circuit breaker with hold circuit relay must be fitted and set to the nominal current shown on the motor serial plate (d; next page). TAWI recommends using protection degree IP54 for the breaker and cables. Installation may only be carried out by an authorised electrician.



c

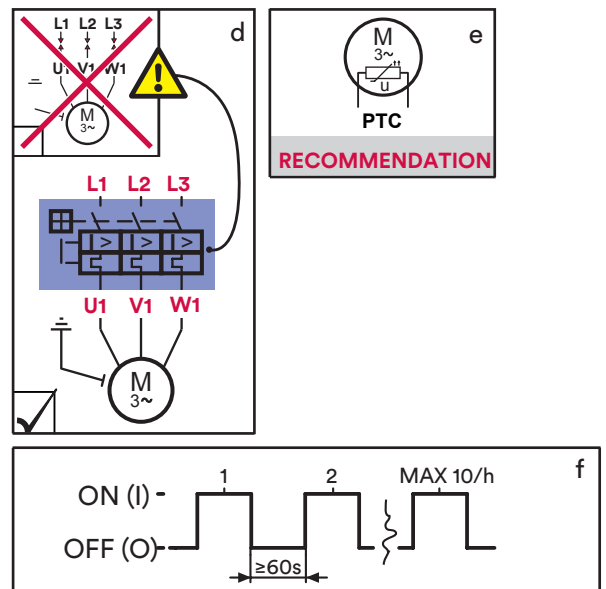
4. Optional, for installation of optional TAWI supplied electric function like radio or automatic pump off, connect the motor power cable to the contactor, L1 / L2 /L3 and the ground cable to the green/yellow terminal.

Connect the power cable to a power source.

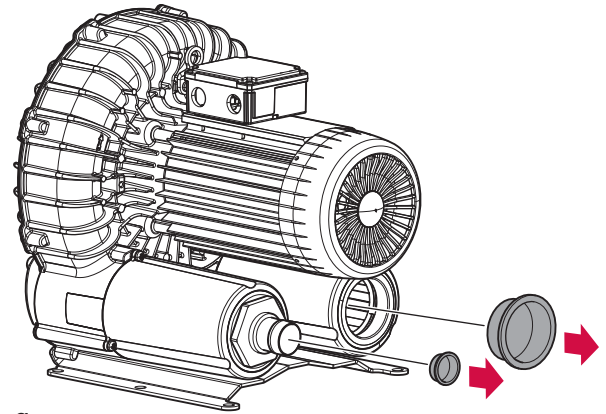


Note! For electric installations within ATEX zone, make sure to use ATEX certified components.

5. TAWI strongly recommends that the PTC is connected to a thermal relay for overheating protection (e). Wait at least 60 seconds and let the fan stop before turning it on again (f).

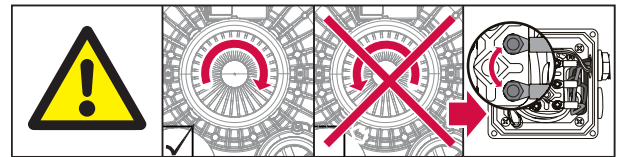


6. Remove the vacuum and pressure covers (g).

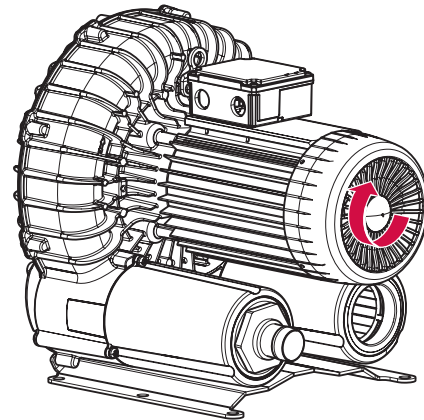


g

7. Verify function of the vacuum pump and that it rotates in the clockwise direction (h). If the pump rotates in the anti-clockwise direction, switch electrical phases and test the pump again.

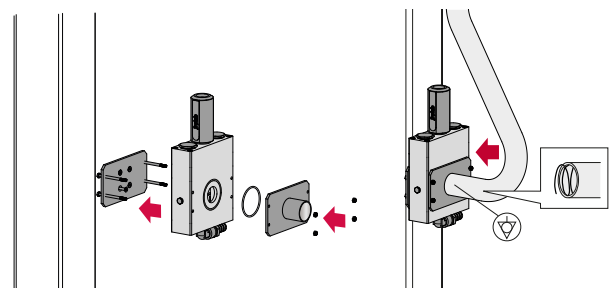


h



Install ejector pump

1. Mount the ejector pump in a suitable position.
2. Connect the ejector pump.
3. Make sure to connect the earth cable in a suitable position as shown in (i). Installation may only be carried out by an authorised electrician.
4. Remove the vacuum and pressure covers.
5. Use anti static compressed air hose for feed pressure.
6. Verify function of the ejector pump.



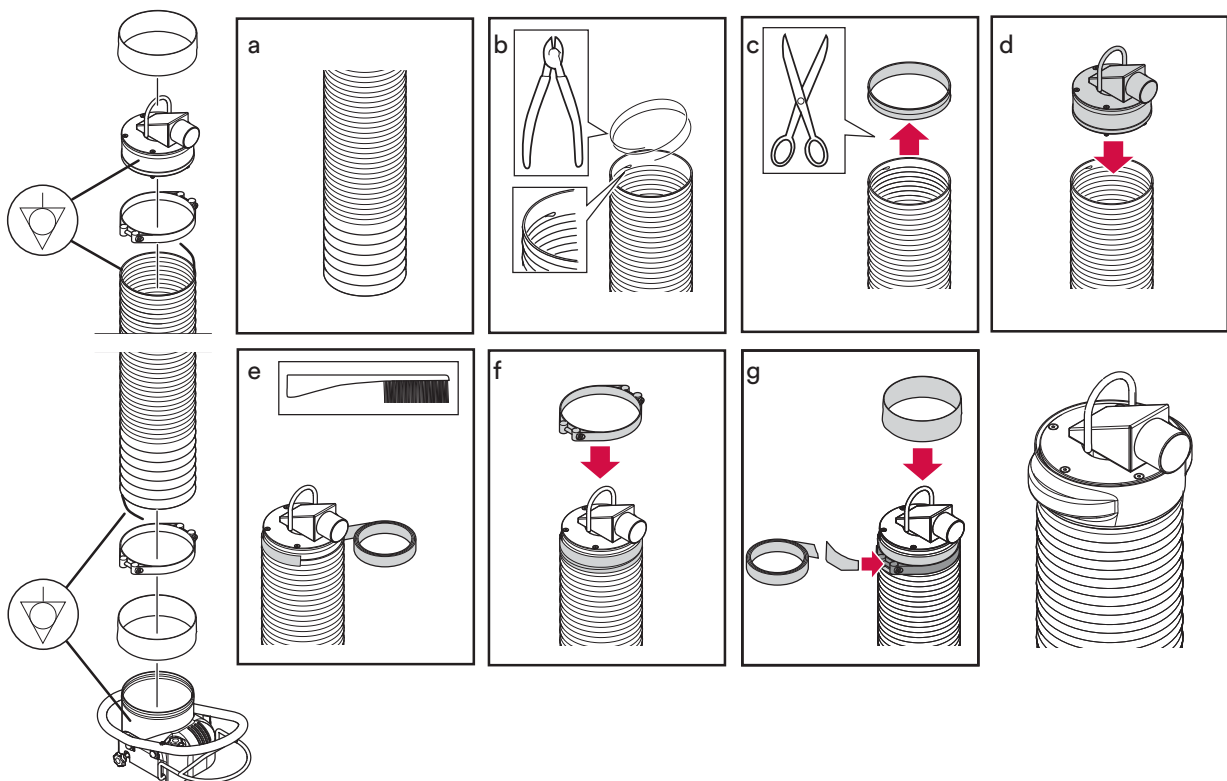
i

Shorten or change lift tube

If necessary, the lift tube may be shortened or changed. First mount the top swivel, then the suction head.

Mount top swivel

1. For VMEx30-80: Identify which end of the tube is the lower, reinforced part. For VMEx100-270 the complete tube is reinforced (a).
2. Start at the top of the tube. Cut off two complete spiral windings from the end (three windings for models VMEx100-270) (b).
3. Pull out the spiral carefully. Take care not to damage the neoprene.
4. Bend the spiral end so that it cannot damage the material.
5. If necessary, cut the tube for a straight edge. Leave approximately 1,5-2 cm of neoprene (approximately 5,5 cm for models VMEx100-270) (c).
6. Push the top swivel into the lift tube (d). At least one complete spiral winding must cover the swivel.
7. Make sure the area is clean and dust free before taping. Attach the lift tube to the swivel with at least three layers of duct tape under each clamp (e).
8. Attach the clamp right next to, but NOT on top of the first spiral winding. Check that the clamp position is straight before tightening (f).
9. Tighten the lift tube clamp. Refer to the table below for correct clamp torques for your model.
10. Attach the second clamp beside the first one and tighten (VMEx60-80: one power clamp only).
11. Cover the clamp attachment with two pieces of duct tape (15 cm) (g).
12. Pull down the rubber band to cover the clamps and duct tape. Continue to mount the suction head.
13. Make sure to reconnect the earth cable.

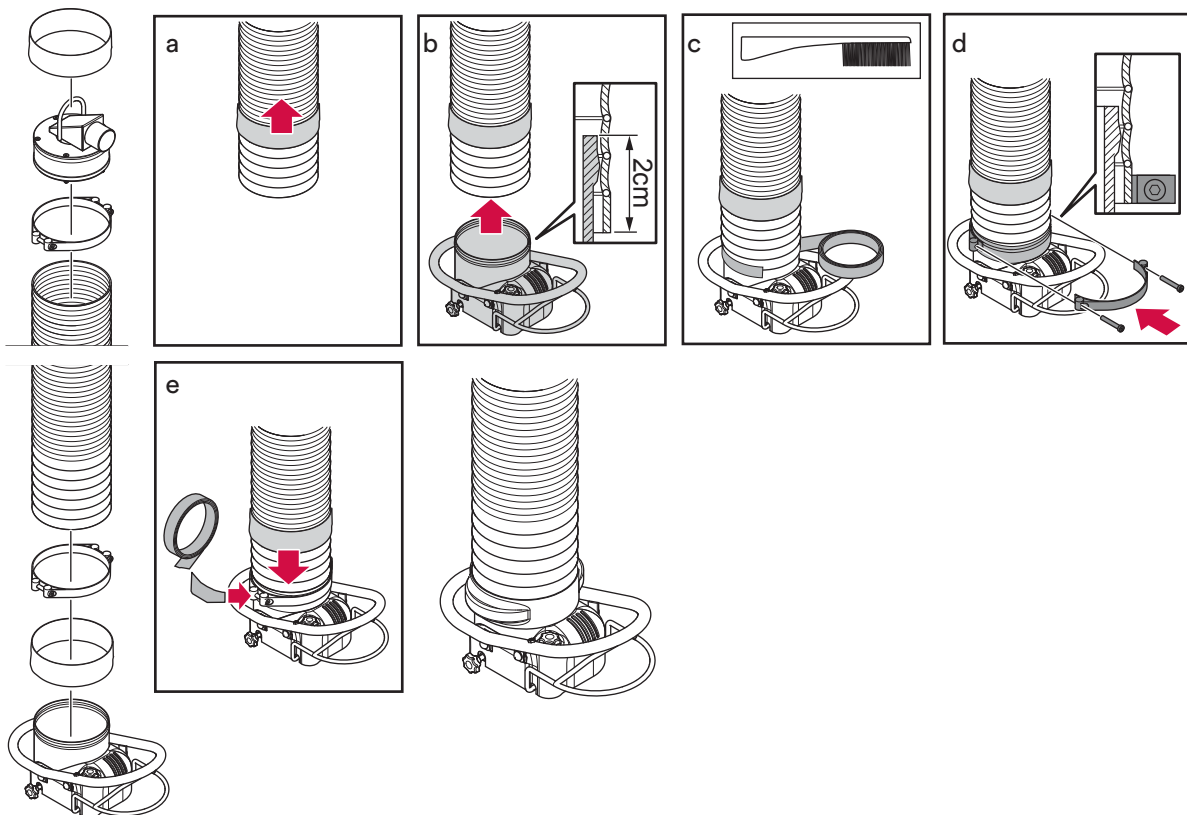


Mount suction head

1. On the suction head side: repeat steps 1-5 from *Mount top swivel on page 20*. Put the rubber band around the lift tube, approximately 10 cm from the end (a).
2. Insert the suction head into the lift tube (b).
3. Allow the lift tube neoprene material to cover at least two cm measured from the top of the suction head.
4. Make sure the area is clean and dust free before taping. Attach the lift tube to the suction head with at least three layers of duct tape under each clamp (c).
5. Attach the clamp right next to, but NOT on top of the first spiral winding. Check that the clamp position is straight before tightening (two power clamps for models VMEx100-270) (d).
6. Tighten the lift tube clamp. Refer to the table below for correct clamp torques for your model.
7. Cover the clamp attachment with two pieces of duct tape (15 cm) (e).
8. Pull down the rubber band to cover the clamps and duct tape.
9. The lifter is now ready for a test lift.
10. Make sure to reconnect the earth cable.



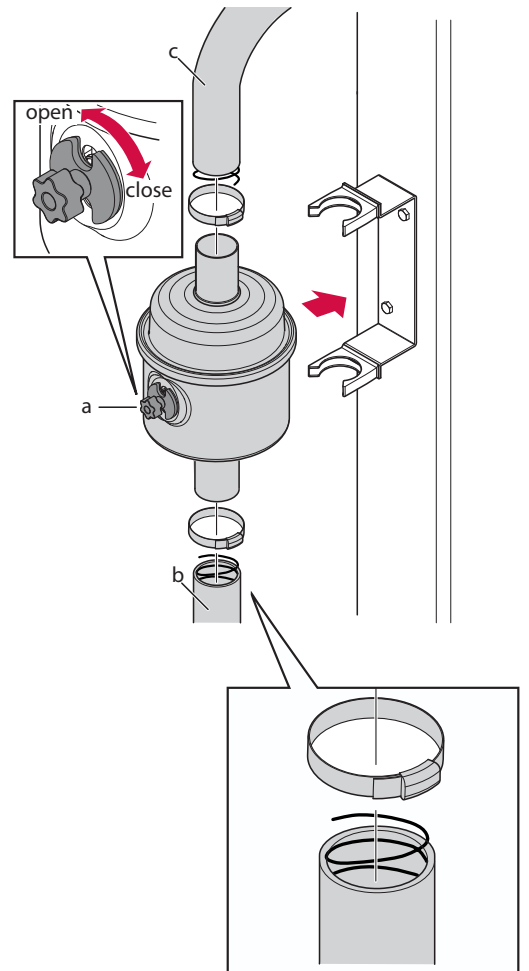
To make sure the TAWI Multifunctional lifter ATEX is fully grounded, there are a pre-wired earth cable between the suction head and the steel spiral in the lift tube.



Model	VMEx30-50	VMEx60-80	VMEx100-270
No. of clamps	Two clamps (top swivel) One clamp (suction head)	One power clamp	Two power clamps
Torque	>6 Nm	>18 Nm	> 20 Nm

Install filter unit and air tubes

1. Mount the filter unit in the holder where it is easy to reach and with the filter unit lid in the upward direction (see figure).
2. An open filter unit control valve lowers lifting speed and may be used by new operators. Verify that the valve is closed before continuing (a).
3. Connect section one of the air tube between the vacuum pump and the filter unit with hose clamps (use a clamp torque of 5 Nm) (b). **Make sure to remove the plastic isolation from the steel spiral of the air tube before it's connected to the vacuum pump.**
4. Connect section two of the air tube between the filter unit and the lift tube top swivel with hose clamps (use a clamp torque of 5 Nm) (c). **Make sure to remove the plastic isolation from the steel spiral of the air tube before it's connected to the top swivel.**



VME_x30/40/50 come with a reducing socket which is placed inside the filter inlet. The filter inlet and outlet are marked with an arrow.



The system must be completely grounded to prevent static electricity ignition.



- Electrical installation **MUST** only be carried out by an authorised electrician.
- Take care to mount the filter unit in the correct orientation during reassembly. Damage to the pump may occur if the filter unit is mounted upside-down.
- Make sure to install all air hoses as straight as possible. Sharp hose bends will reduce lifting capacity and may cause the pump to overheat.
- Do not use more than 30 m of hose for the entire installation. Lifting capacity will be reduced and may cause the pump to overheat.
- Do not switch or change the heat resistant pressure hose on the base plate. Use of another hose than the one provided by TAWI may cause it to melt and cause permanent damage to the vacuum pump.



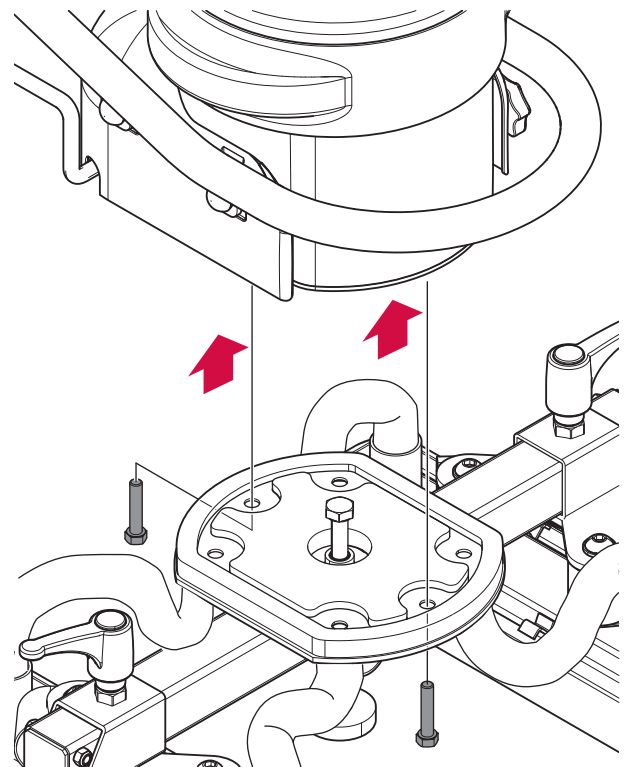
- Use protective eye wear.
- These instructions must be carefully followed. Failure to do so may cause the unit to fall down and cause bodily injuries.
- The system must be completely grounded to prevent static electricity ignition.



- The different models are equipped with different types and number of clamps. It is extremely important to identify which model you are working on (see machine sign). Only use the clamps provided by TAWI.
- The lift tube clamps must NEVER cover any part of the tube spiral winding.
- TAWI assumes no responsibility for unauthorized modifications.
- Cutting the lift tube may change the characteristics of the TAWI Multifunctional lifters ATEX. TAWI must authorize all modifications of the lift tube.

Install suction foot and touch bolt

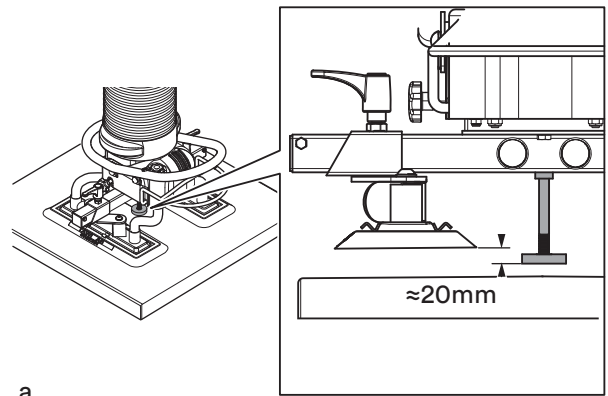
1. Fit the suction foot or quick change attachment with two or four M6 (VM30-120) or M8 bolts (VM180/270) directly to the suction head. Use a torque between 2-3 Nm for the bolts.



The touch bolt provides help for the operator by opening the suction head valve fully, enabling a good grip of the load.

2. Fit the touch bolt:

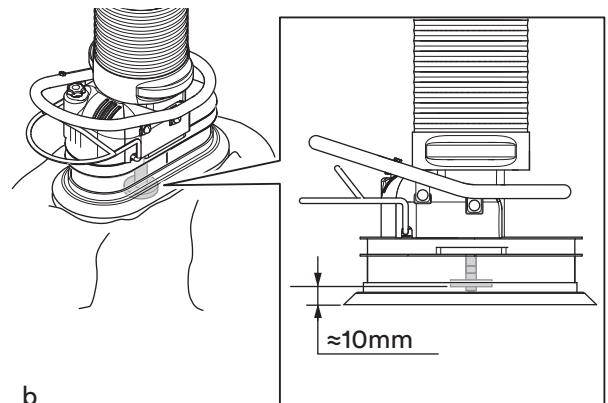
- a. Fit the touch bolt with the head of the bolt about 10-20 mm below the edge of the suction foot (a).
- b. If the suction foot for sacks is used, adjust the bolt head so that it is installed approximately 10 mm above the edge of the suction foot (b).



a

3. If the quick change attachment is used, install a suitable suction foot, see *Change suction foot, quick release on page 33*.

4. Verify that the suction foot is securely fastened to the suction head.



b



The system must be completely grounded to prevent static electricity ignition.



- Make sure to use the correct torque for the bolts when installing the suction foot. Do not over- or undertighten. Air leakage may occur otherwise, reducing lifting capacity.
- If the quick release attachment is used, the touch bolt must be removed.

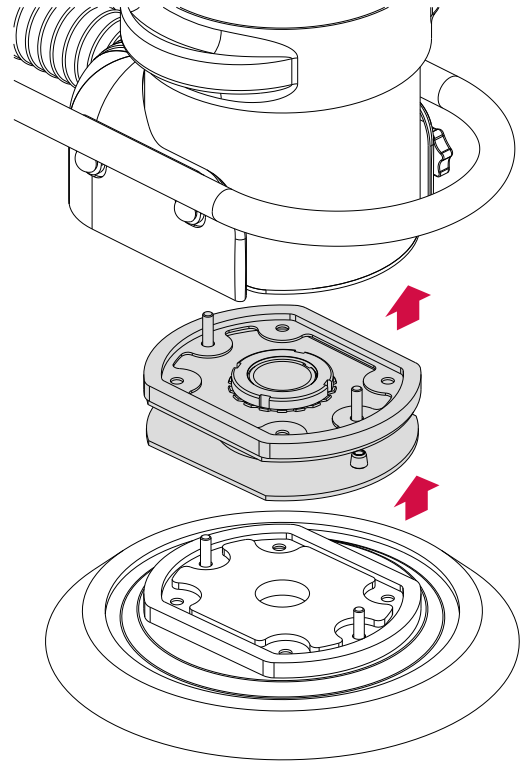


- The touch bolt can be removed if it is in the way for normal lifting operations. Remove the bolt and plug the bolt hole with a standard M8 bolt and nut.
- The touch bolt must be adjusted to the exact right position depending on the suction foot. Please contact your salesman to be sure of the position.

Install accessories

1. Fit the accessory with two or four pcs of M6 or M8 bolts directly to the suction head. Use a torque between 2-3 Nm for the bolts.

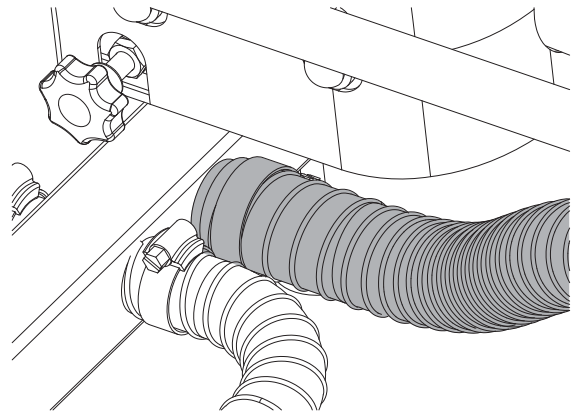
The suction foot/tool can be attached to the accessory.



Some accessories are designed for multiple lifting units and with double hole patterns. For those accessories, a package of plugs is included with the accessory and are used to stop air leakage from the holes not used.

Install release valve: air hose

1. Remove the plastic cap from the air hose pipe of the suction foot/tool.
2. Attach the air tube from the release valve to the air hose pipe.

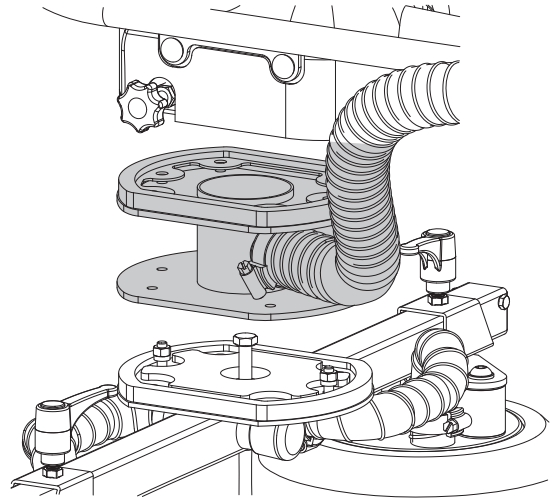


This installation method can only be used for a suction foot/tool with integrated release valve pipe.

Install release valve: chamber

Fit the vacuum chamber with two or four pcs of M6 or M8 bolts directly to the suction head. Use a torque between 2-3 Nm for the bolts.

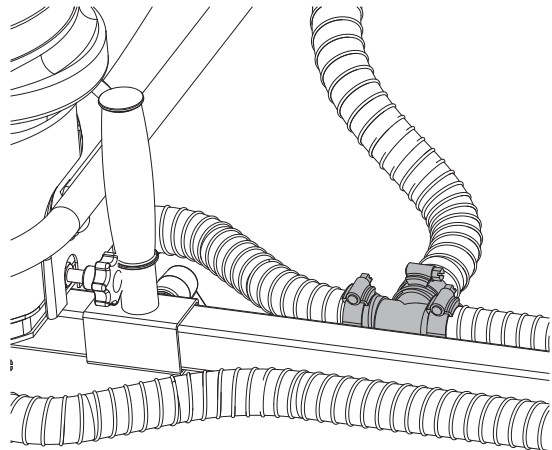
The suction foot/tool can be attached to the vacuum chamber.



The vacuum chamber is designed for multiple lifting units and with double hole patterns. For those accessories, a package of plugs is included with the accessory and are used to stop air leakage from the holes not used.

Install release valve: T-valve

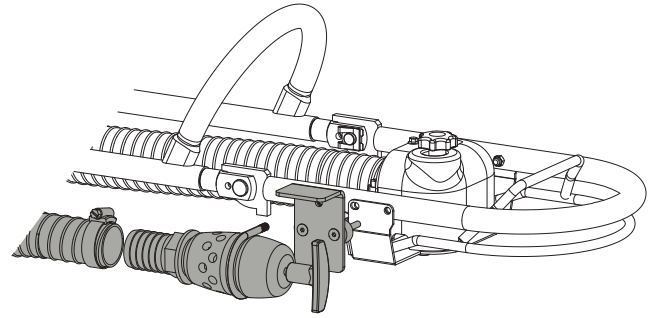
1. Install the T-valve by splitting one of the air tubes on the suction foot/tool.
2. Connect both air tube ends to the T-valve and connect the air tube from the release valve to the last connection of the T-valve.



- This installation method can only be used for a suction foot/tool with external air tubes.
- Make sure the T-valve is the same size as the air tube on the suction foot/tool before cutting the tube.

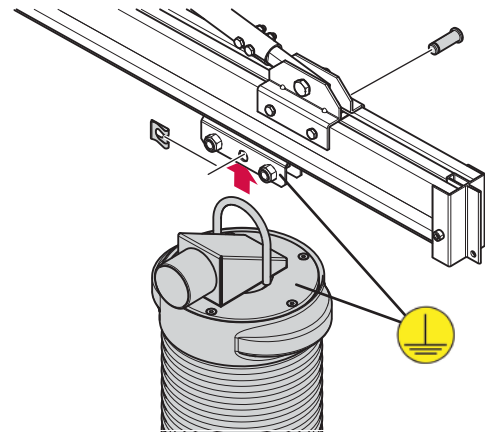
Install release valve on handle

1. Remove the bolts on the left side attaching the valve box to the handle.
2. Use the two new bolts supplied with the release valve to bolt the release valve attachment and the valve box to the handle. Attach the release valve to the attachment with the U-shaped loop.
3. Connect the air tube to the release valve.



Install lifter in crane system

1. Suspend the lift tube from the top swivel in the crane system or jib crane.
2. Adjust suspension so that there is at least 10 cm between the floor and the lowest part of the suction foot.
3. Verify that the lift unit hangs and moves freely so that unnecessary wear is avoided.
4. Verify that the crane system or jib crane is horizontal so that the lift tube does not move laterally by its own weight.

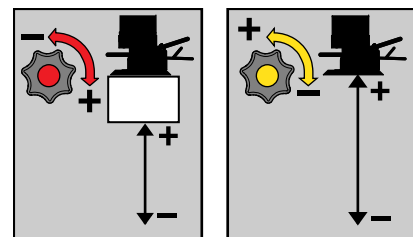


The system must be completely grounded to prevent static electricity ignition.

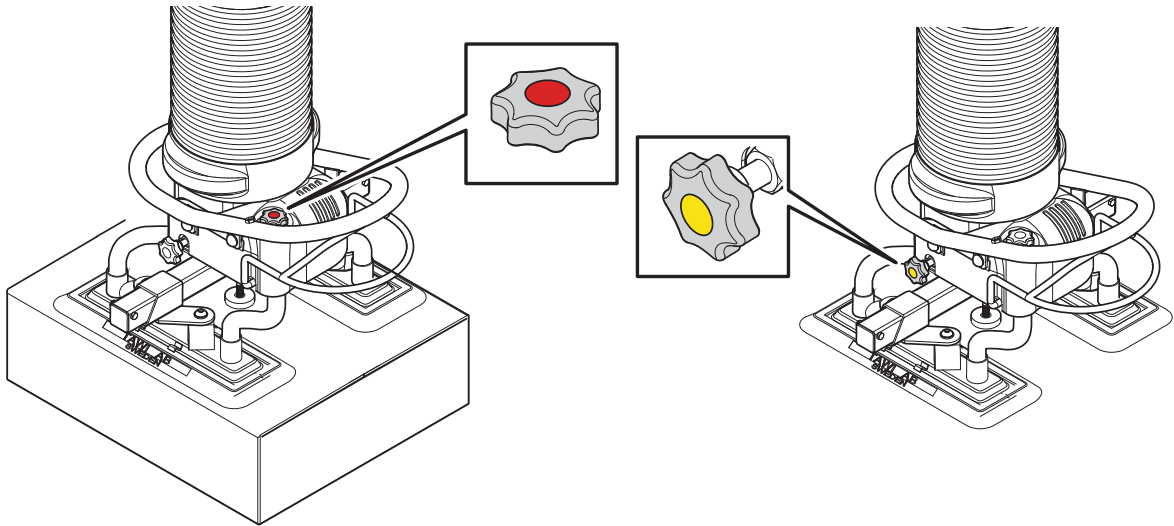
Adjust load balance

Balance the unit with and without load to a convenient level for the operator. This ensures that the control handle is within comfortable reach at all times.

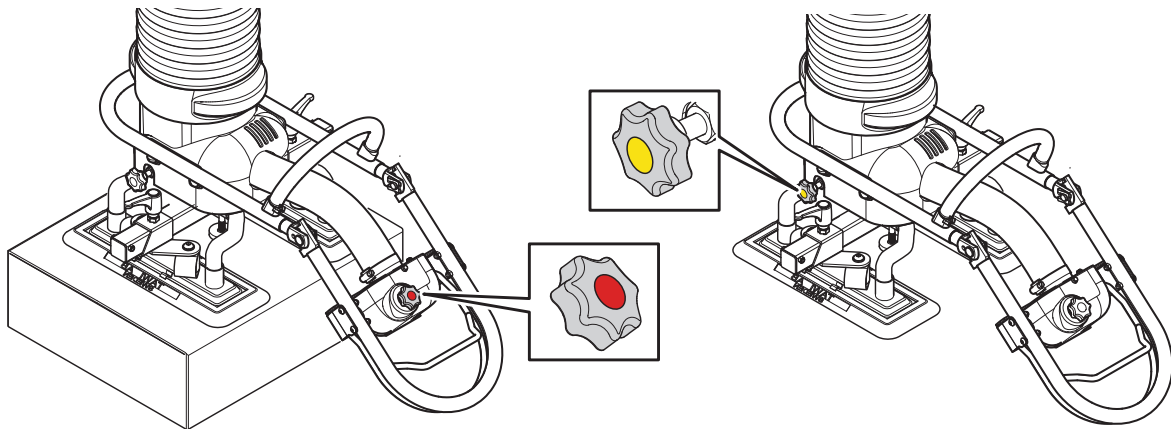
1. Press the main switch to turn the power on.
2. Balance the unit **WITH LOAD**: Turn the red knob carefully until the balance position is reached.
3. Balance the unit **WITHOUT LOAD**: Loosen the lock nut and turn the yellow knob carefully until the balance position is reached. Tighten the lock nut.



- Adjust balance in the order provided by the instructions. If not, a readjustment of load balance will be necessary.
- The adjustment screws are located in different positions depending on handle type (see illustrations on next page).



1. Load adjustment knob positions (with and without load), standard handle



2. Load adjustment knob positions (with and without load), flex handle

Verify installation

When the installation of the vacuum lifter is carried out, and before the vacuum lifter is put into operation, it must be submitted to a dynamic operational test at the place of installation. The dynamic operational test must be carried out by qualified technicians with a load of 1.1 times the maximum load specified by the manufacturer.

This test shall be carried out for each motion of the vacuum lifter, testing its full function, with repeated starts and stops throughout the complete working range.

This test shall be considered successful if the vacuum lifter has been found to perform all its functions and if the examination subsequent to the test reveals no damage to mechanisms or structural components, and no connection has been loosened or been damaged.

Fill in the test form in *Appendix I* on page <?> when the test is completed and keep it available with this manual for future use.



- The system must be completely grounded before the TAWI Multifunctional lifter ATEX is taken into service.
- Motion limiters may not be used to limit the horizontal motion of the vacuum lifter. The installation of a motion limiter may cause serious damage to the vacuum lifter. It may also cause involuntary disengagement of parts resulting in parts falling down and the risk of serious body injuries.
- Note the colour code system for safe assembly of lift unit to suction foot /accessory. **ONLY PARTS WITH MATCHING COLOUR CODE MARKING MAY BE ASSEMBLED!** Incorrect combinations of lift unit and accessory may cause very serious injuries.



- Do not start/test the vacuum pump before installation is complete and the suction foot is >10 cm from ground!
- Any modifications to the product must be carried out by qualified TAWI technicians.
- A mandatory dynamic operational test must be executed before the vacuum lifter may be put into operation.



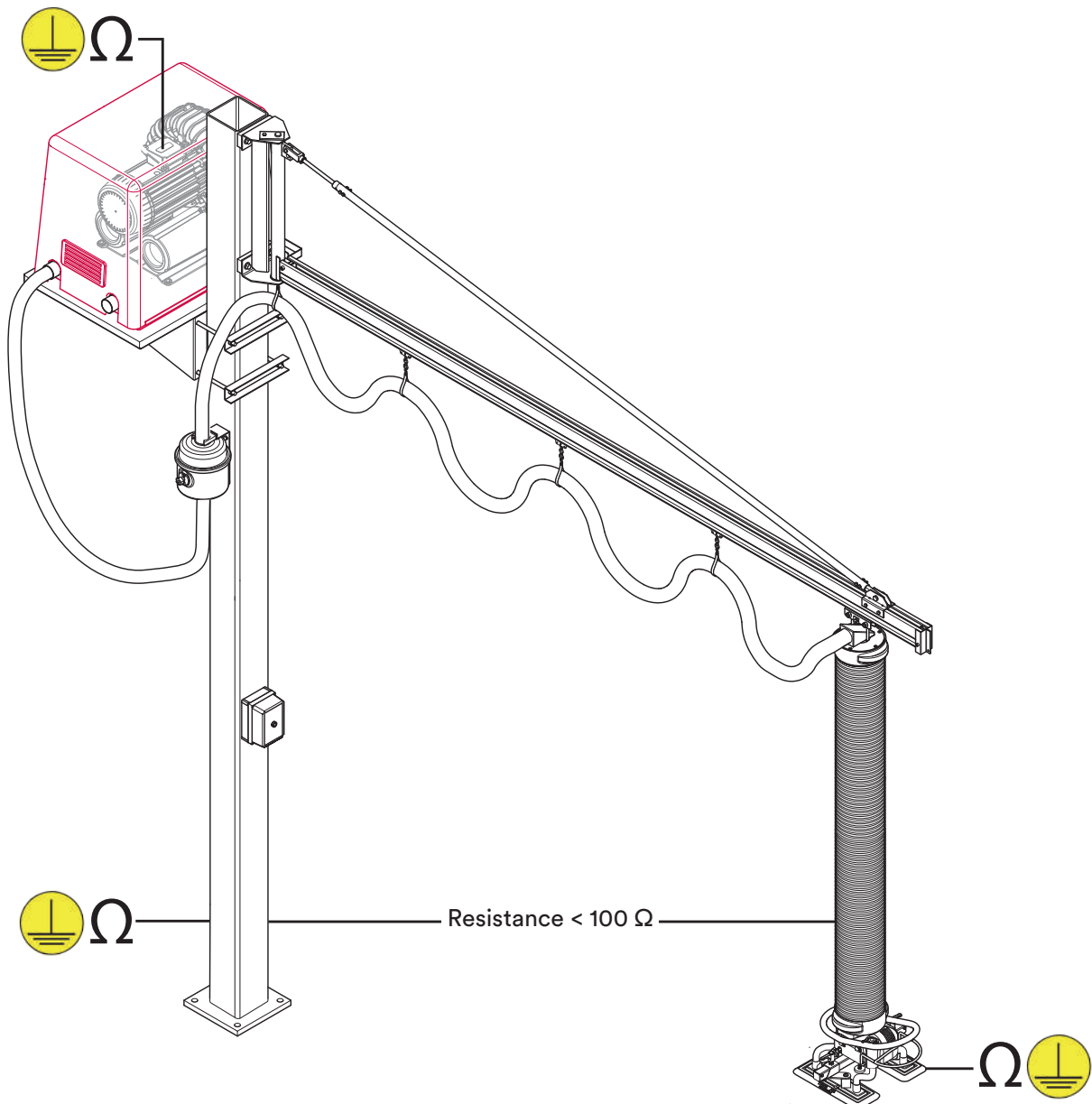
- The lifters are made for use under a roof protected from wind and rain.
- The lighting in the place of installation must be adequate, during installation and operation.
- The overhead crane system/jib crane must be approved for the rated maximum lifting capacity of the vacuum lifter.
- During design and installation of the suspending system, it is vital to take into account relevant standards and regulations, the load bearing capacity of the ceiling and floor structure and the attachment devices and the relevant basic design information of the suspending system. For information on suspension (jib crane, crane system etc) see separate manual.
- The overhead crane system must be installed by qualified technicians and all safety and maintenance instructions must be followed.
- Re-tighten all bolts within 1-2 months of installation.
- This vacuum lifter may not be used before the test in Appendix I has been carried out and signed.

Resistance test



The most important factor for a substantial explosion protection is the grounding condition of the equipment. To ensure that static electricity passes through the lift unit, the resistance must not exceed 100 Ohm.

- Measure the resistance between suction foot and column to make sure there are connection between these two points.
- Measure the resistance between suction foot and pump to make sure there are connection between these two points.



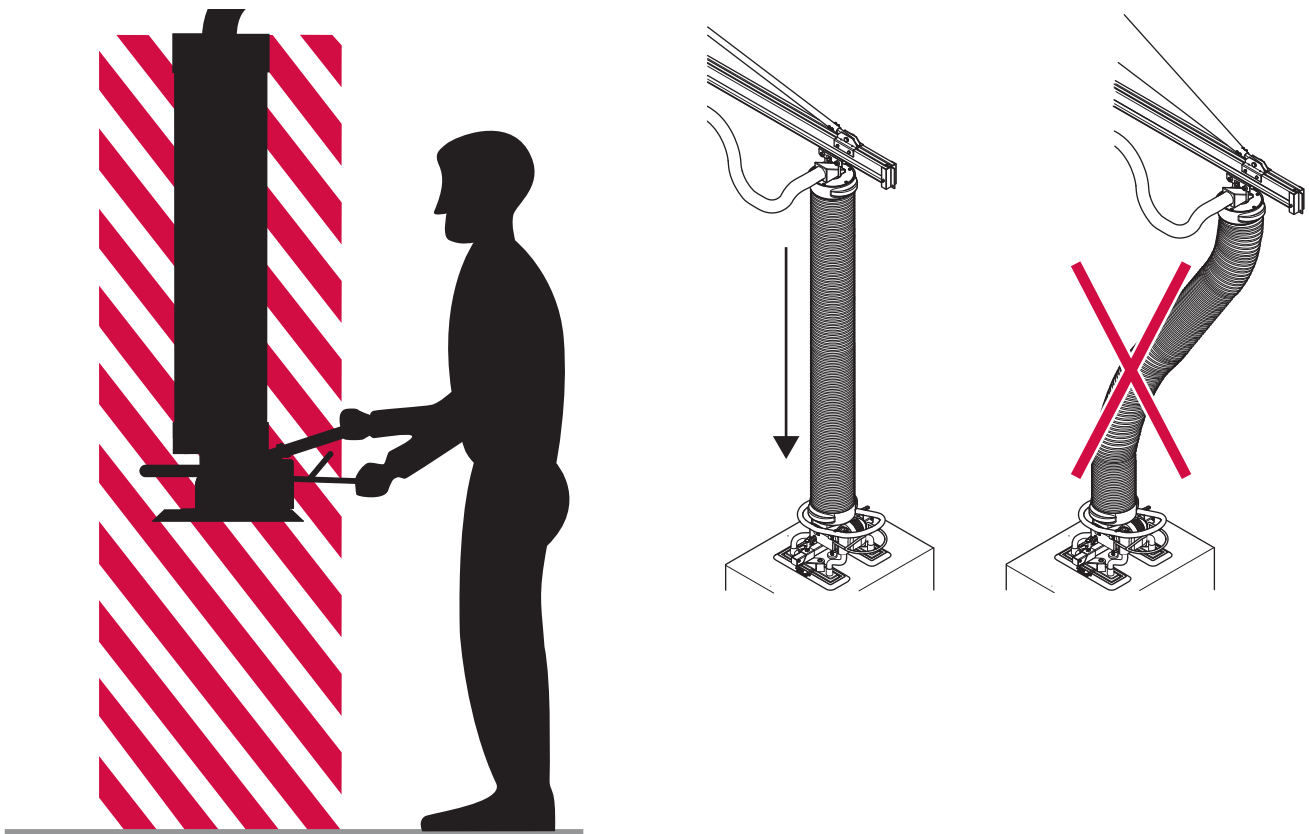
5 User instructions

This chapter describes how to operate the TAWI Multifunctional lifters ATEX.

Start lifter

Review and perform relevant inspections: see 6 *Service & maintenance on page 35*.

1. Press the main switch or remote control to turn the power on.
2. Verify that the lift unit hangs and moves freely so that unnecessary wear is avoided.
3. Verify function of the lifter.
4. The lifter is now ready for use.

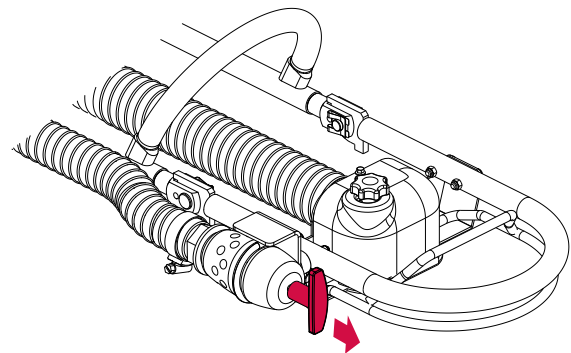
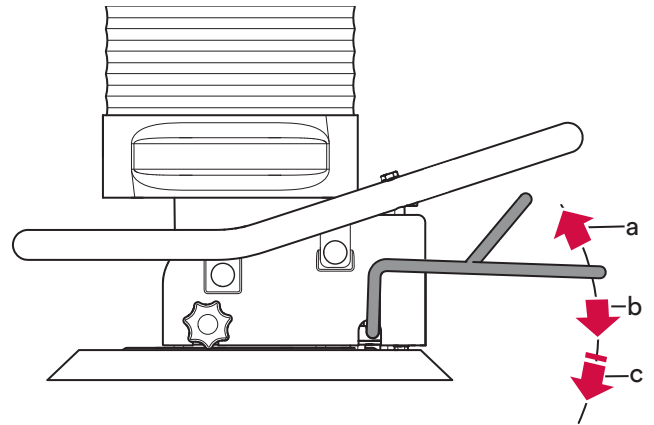


- A damaged electrical cable could cause electrical shock.
- The operator must be trained on the product and all instructions in the manual must be followed.
- When in operation the operator must not place his head above the unit.
- When in operation the operator must not be under a hanging load.
- The lift tube must be used only in a vertical position.
- The max lifting capacity (SWL) must not be exceeded.
- Use vacuum power only to handle the load. Do not lift the load by hand force.
- A load must never be left hanging for an extended period of time. This can cause the vacuum pump to overheat.

Use lifter

Review and perform relevant inspections. See 6 *Service & maintenance on page 35*. The filter has a control valve to reduce the lifting speed when handling light loads, see *Install filter unit and air tubes on page 22*.

1. Move the lift tube so that it can be placed directly over the load.
2. Lower the suction foot towards the load by pressing the operating handle downwards.
3. Allow the suction foot to grip the load.
4. Lift the load by pulling the operating handle upwards (a).
5. Move the load to required position and lower it by pressing the operating handle down (b).
6. Release the suction foot from the load,
 - a. by pressing the operating handle right to the bottom and braking the seal (c), or
 - b. If a release valve is used: by pressing the operating handle right to the bottom and pulling the release valve handle at the same time (d).



- Never use the release valve when handling a free hanging load.
- Position the goods safely on a surface before use of release valve.



- Only run the lifter when it is completely assembled.
- Maintenance instructions must be followed.
- Service record must be accessible for inspection.
- Use only original TAWI parts.
- The top swivel joint includes a safety valve. The valve automatically closes if the power fails and the load sinks to the floor in a controlled manner. Let go of the handle and move away from the lifter.

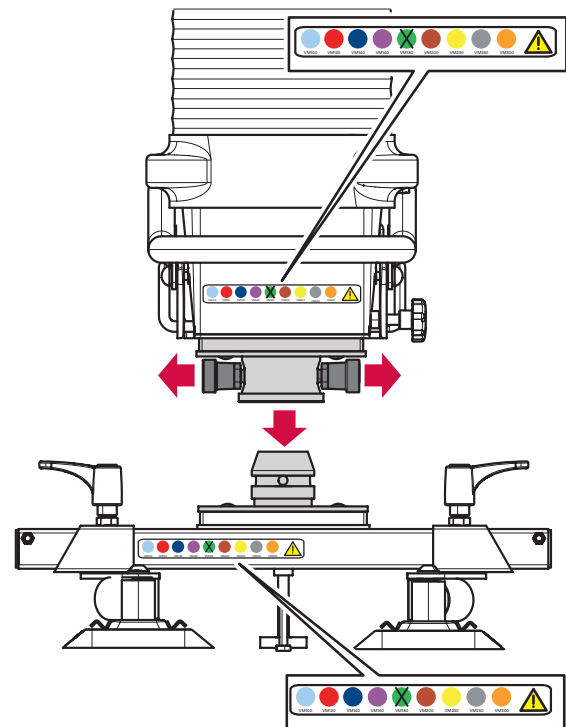


- Check the lifter for safe functionality prior to each use, for instructions, see 6 *Service & maintenance on page 35*.

Change suction foot, quick release

The lifter can be equipped with optional tools for different load types. The quick change attachment enables easy tool changes.

1. If not done, mount the quick change attachment on the suction head and foot according to the instructions for *Install suction foot and touch bolt* on page 23.
2. With the suction foot resting on a firm surface and the vacuum pump turned off, pull and hold the spring-loaded pins.
3. Remove the suction foot.
4. Verify that the suction foot is correct for your model and the colour code matches (see warning below).
5. Connect the new suction foot to the suction head by firmly pressing it in the quick change attachment until the spring-loaded pins engage.
6. Verify that the suction foot is firmly connected to the suction head and that it does not rotate.
7. Verify that the lift unit hangs and moves freely so that unnecessary wear is avoided.
8. Verify function of the lifter.

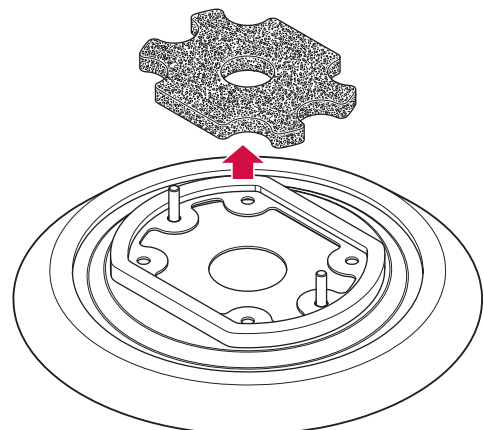


Note the colour code system for safe assembly of lift unit to suction foot/accessory. Each colour corresponds to a specific TAWI Multifunctional lifter model. **ONLY PARTS WITH MATCHING COLOUR CODE MARKING MAY BE ASSEMBLED!** Some suction feet/accessories may be used with several lift models (indicated by the colour code). Incorrect combinations of lift unit and accessory may cause serious injuries.

Clean suction foot filter

The suction foot air filter should be cleaned regularly (once a week, more often if the environment requires).

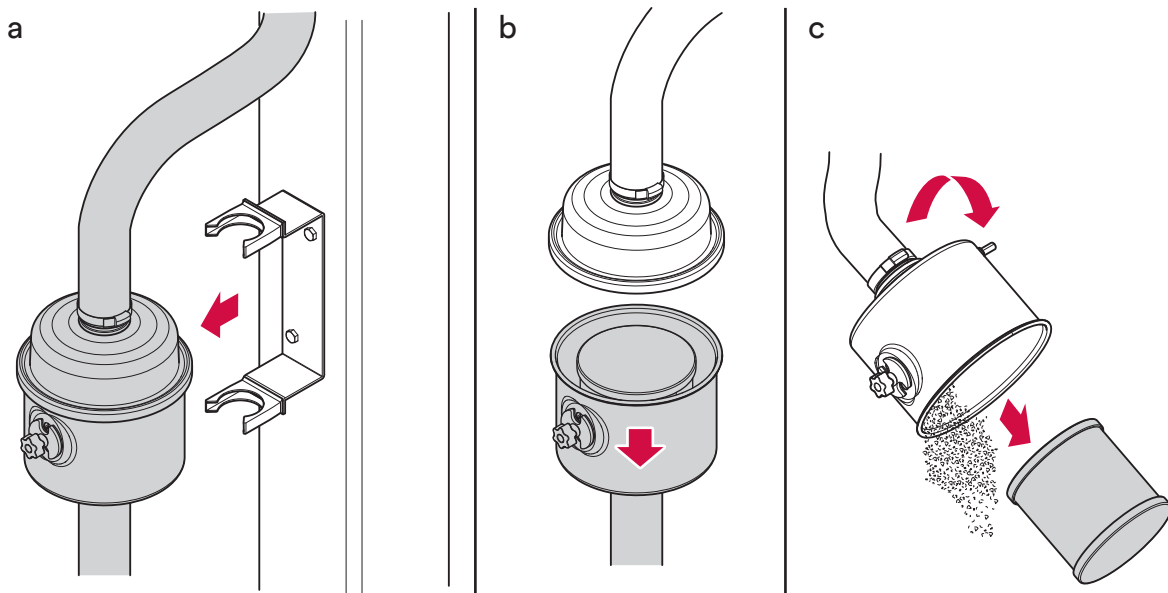
1. Remove the suction foot.
2. Carefully clean the air filter using reduced compressed air.
3. The filter inset **MUST** be replaced when dirty or damaged.
4. Fit the suction foot with two or four M6/M8 bolts to the suction head, see *Install suction foot and touch bolt* on page 23. Use a torque between 2-3 Nm for the bolts.
5. Verify function of the lifter.



Clean vacuum pump filter

The vacuum pump filter should be cleaned regularly (once a week, more often if the environment requires it).

1. Remove the filter unit from the filter holder (a).
2. Open the filter unit (b).
3. Empty the filter unit and remove the filter inset in an upside-down position (c).
4. Carefully clean the filter inset using reduced compressed air.
5. The filter inset **MUST** be replaced when dirty or damaged.
6. Reassemble the filter unit and mount it in the filter holder with the filter unit lid in the upward direction (see figure).
7. Verify function of the lifter.
8. Verify the resistance between the filter unit lid and the filter unit.



- Clean the vacuum pump and suction foot filter regularly. Failure to clean the filters may cause the pump to overheat or reduce lifting capacity.
- Take care to mount the filter unit in the correct orientation during reassembly. Damage to the pump may occur if the filter unit is mounted upside-down in the filter holder.

6 Service & maintenance

This chapter provides information about service and maintenance of the lifters. The chapter is divided into sections based on who is to perform the inspections and how often the inspections are to be carried out. Weekly by the operator, quarterly by inhouse maintenance or yearly by TAWI authorised service technician.

For technical service, maintenance or repairs contact your TAWI representative.

TAWI must authorise all modifications to this product. TAWI assumes no responsibility for unauthorised modifications and guarantees will automatically become invalid if unauthorised modifications have been made.



- Service must be carried out on a yearly basis.
- If any damage/wear is detected on the lifter, this must immediately be reported to TAWI or authorised TAWI representative. The lifter must be taken out of commission and not be used until the damage has been repaired.
- All service must be carried out with the power supply disconnected.
- In order to deal with the vacuum pump cables, a good knowledge of electricity and TAWI electrical schedules of the lifters is required.
- The service/maintenance staff carrying out repairs must have adequate experience and knowledge for this kind of work. If there are any doubts regarding method, material etc., please contact the manufacturer.
- The use of non-original spare parts invalidates the warranty and can cause risk of personal injury and damage to the unit.



- Keep clean. Never spray or pour water onto any part of the vacuum pump or electrical cables.
- All earthed wires must be inspected regularly. Check for signs of wear and make sure all connections are secure. (Top swivel, suction head and separate point of earth.)
- On a regular, yearly basis the earthing of the system must be checked by an authorized electrician or TAWI-representative. Measure the resistance between any point on the suction foot and the lift units earthed connection on the ejector suspension. To ensure that static electricity passes through the lift unit, the resistance must not exceed 100 Ohm.
- Do not wipe down the lift tube with cloth or similar that can induce static electricity.
- Any manipulation or replacing of parts on this lift unit may only be carried out by TAWI representatives and the resistance of the system must be checked immediately after.
- Always follow any local/national recommendations as well as the instructions in this manual. In some countries the inspection is mandatory of the lifting equipment by a third party, after installation and then on a yearly basis. Check the regulations in your country.

Inspections

The following inspections are to be carried out.

Weekly inspections by operator

1. If yearly service has been carried out, make sure that the service inspection date is valid.
2. Check all bolts and nuts for damage or wear.
3. The top swivel joint includes a safety valve. The valve automatically closes if the power fails and the load sinks to the floor under control. Check the operation of the safety valve by lifting a load approximately 1 m., close the operating handle fully, and then stop the vacuum pump. The load should be equivalent to the rated max lifting capacity and of a non-porous material (for example, a steel plate). A controlled sinking motion is correct – anything else: do not use the lift and contact your vacuum lifter dealer immediately.
4. Check all connecting components (clamps between lift tube and suction head, clamps between lift tube and top swivel, clip and pin in crane system trolley eyelet, air tube clamps, bolts for suction foot).
5. Clean the air filters (filter unit and suction foot), more often if the working environment demands it.
6. Check the lift and air tubes for signs of damage or wear. A damaged lift or air tube must be replaced immediately.
7. Check that the max lifting capacity, warning and operating signs are visible.
8. Make sure the lift runs smoothly in the crane system or jib rig.
9. Make sure that the operating valve is functioning properly.
10. Check that the vacuum lifter achieves maximum lifting capacity. The designated load should be easily held by and lifted with the vacuum lifter. Lifting capacity is reduced if a vacuum leak occurs. See trouble shooting for more info.

Quarterly inspections by inhouse maintenance

1. Double check (carry out) all inspections mentioned in Weekly inspections by operator.
2. Check the lift and crane system or jib rig for signs of damage/wear and that bolts and pins are tightened and in place.
3. The ground of the system must be checked by an authorised electrician. The resistance between the suction foot and the column should not exceed 100 ohms.

Yearly inspections by TAWI authorised service technician

1. Perform the actions described in the yearly Service-/Inspection report provided by TAWI.
2. Update the Inspection record *in Appendix I*.

7 Troubleshoot

This chapter provides information on how to investigate or rectify problems that may occur. Actions marked with (*) must be carried out by TAWI or a TAWI authorised service technician.

Problem	Likely caused by	Action required
Vacuum lifter does not lift	Vacuum pump not started	→ Check function of vacuum pump. See <i>Install vacuum pump on page 17</i> .
	Load too heavy	→ Reduce load. It must not exceed the lifting capacity of the lift.
	Air leakage	→ Check connections, air and lift tube for damage or wear. Tighten clamps and, if necessary, change air or lift tube (see <i>Shorten or change lift tube on page 20</i>). Check filter unit for leakage.
	Dirty vacuum pump filter	→ Clean filter inset, see <i>Clean vacuum pump filter on page 34</i> .
	Dirty suction foot filter	→ Clean suction foot filter, see <i>Clean suction foot filter on page 33</i> .
	Vacuum pump installed in the wrong direction	→ Check the direction of rotation of the vacuum pump. Is air blowing from the silencer? If not, change the phases over. This must be carried out by a qualified electrician, see <i>Install vacuum pump on page 17</i> .
	Suction foot installed incorrectly	→ Remove suction foot and clean the foot filter. Refit suction foot, see <i>Install suction foot and touch bolt on page 23</i> . Do not overtighten the fixing bolts. Problems can occur because the bolts are undertightened or overtightened. Overtightening may deform the top of the suction foot.
	Suction foot rubber gasket damaged or worn	→ Replace gasket.
Tool moves slowly up/down	Air leakage	→ Check connections, air and lift tube for damage or wear. Tighten clamps and, if necessary, change air or lift tube (see <i>Shorten or change lift tube on page 20</i>). Check filter unit for leakage.
	Filter unit control valve open	→ Adjust filter unit control valve, see <i>Install filter unit and air tubes on page 22</i> .
Operating handle too high or low	Wrong adjustment of load balance	→ Adjust load balance without and with load, see <i>Adjust load balance on page 27</i> .

Problem	Likely caused by	Action required
Vacuum pump does not start	Motor circuit breaker has tripped.	→ Check electrical parts and reset circuit breaker.
	Main switch is turned off.	→ Turn main switch on.
	PTC relay has tripped	→ Let the vacuum pump cool down and verify that air flow is sufficient. Reset the PTC relay.
	Remote control out of batteries or out of range	→ Replace batteries or move closer to the vacuum pump.

8 Compatible tools for Multifunctional lifter

This table presents the approved tools for TAWI Multifunctional lifters. Only these tools will complete an approved product.

For approval of custom tools, see *chapter 9: TAWI Tool compliance*.

Specification No.	Item No.	Item description	VM30	VM40	VM50	VM60	VM80	VM100	VM120	VM180	VM270
630205	4200303	Flat suction foot, Ø200mm, SS	●	●	●						
630305	4200306	Bag foot in stainless steel, 165x270mm	●	●	●						
630605	4200312	Yoke with fixed feet, (2x) 85x200mm, SS	●	●							
630655	4200315	Yoke 400mm with adjustable feet, SS	●	●							
630705	4200318	Flat suction foot, 100x250mm, SS	●								
630715	4200320	Flat suction foot, 140x205mm, SS	●	●							
640235	4200323	Flat suction foot, Ø270mm, SS	●	●	●						
640655	4200325	Yoke 400mm with adjustable feet, SS	●	●	●						
610205	4200244	Flat suction foot with V-gasket, Ø270mm				●	●				
610235	4200246	Flat suction foot, Ø270mm				●	●				
610305	4200257	Bag foot in stainless steel, 180x370mm				●	●				
610445	4200311	Single hook, with safety lock, SS				●	●				
610605	4200267	Yoke 400mm with adjustable feet, SS				●	●				
610705	4200279	Flat suction foot, 200x320mm, SS				●	●				
610715	4200282	Flat suction foot, 200x290mm, SS				●					
610500SS	4200333	Suction foot 125x580mm, SS				●	●				
620305	4200289	Bag foot in stainless steel, 205x460mm				●					
620605	4200293	Yoke 500mm with adjustable feet, SS				●	●				

9 TAWI Tool compliance

This table presents the approved components for TAWI Multifunctional lifters ATEX.

Lift units

Item number	Specification	Description	Comment
4200011	631260	VMEx30/2,5 ATEX VacuEasylift - Standard handle	
4200012	631270	VMEx30/2,5 ATEX VacuEasylift - Fixed handle	
4200013	631280	VMEx30/2,5 ATEX VacuEasylift - Flexed handle	
4200023	631460	VMEx30/4,0 ATEX VacuEasylift - Standard handle	
4200024	631470	VMEx30/4,0 ATEX VacuEasylift - Fixed handle	
4200025	631480	VMEx30/4,0 ATEX VacuEasylift - Flexed handle	
4200041	632260	VMEx40/2,5 ATEX VacuEasylift - Standard handle	
4200042	632270	VMEx40/2,5 ATEX VacuEasylift - Fixed handle	
4200043	632280	VMEx40/2,5 ATEX VacuEasylift - Flexed handle	
4200053	632460	VMEx40/4,0 ATEX VacuEasylift - Standard handle	
4200054	632470	VMEx40/4,0 ATEX VacuEasylift - Fixed handle	
4200055	632480	VMEx40/4,0 ATEX VacuEasylift - Flexed handle	
4200069	634260	VMEx50/2,5 ATEX VacuEasylift - Standard handle	
4200070	634270	VMEx50/2,5 ATEX VacuEasylift - Fixed handle	
4200071	634280	VMEx50/2,5 ATEX VacuEasylift - Flexed handle	
4200081	634460	VMEx50/4,0 ATEX VacuEasylift - Standard handle	
4200082	634480	VMEx50/4,0 ATEX VacuEasylift - Flexed handle	
4200093	616270	VMEx60/2,5 ATEX VacuEasylift - Fixed handle	
4200094	616280	VMEx60/2,5 ATEX VacuEasylift - Flexed handle	
4200104	616470	VMEx60/4,0 ATEX VacuEasylift - Fixed handle	
4200105	616480	VMEx60/4,0 ATEX VacuEasylift - Flexed handle	

Item number	Specification	Description	Comment
4200116	618260	VMEx80/2,5 ATEX VacuEasylift - Fixed handle	
4200117	618280	VMEx80/2,5 ATEX VacuEasylift - Flexed handle	
4200125	618460	VMEx80/4,0 ATEX VacuEasylift - Fixed handle	
4200126	618480	VMEx80/4,0 ATEX VacuEasylift - Flexed handle	
4200134	620270	VMEx100/2,5 ATEX VacuEasylift - Fixed handle	
4200135	620280	VMEx100/2,5 ATEX VacuEasylift - Flexed handle	
4200143	620470	VMEx100/4,0 ATEX VacuEasylift - Fixed handle	
4200144	620480	VMEx100/4,0 ATEX VacuEasylift - Flexed handle	
4200153	623270	VMEx120/2,5 ATEX VacuEasylift - Fixed handle	
4200154	623280	VMEx120/2,5 ATEX VacuEasylift - Flexed handle	
4200162	623470	VMEx120/4,0 ATEX VacuEasylift - Fixed handle	
4200167	625270	VMEx180/2,5 ATEX VacuEasylift - Fixed handle	
4200175	650270	VMEx270/2,5 ATEX VacuEasylift - Fixed handle	

Suction feet

Item number	Specification	Description	Comment
4200303	630205	Flat suction foot, Ø200mm, SS	VMEx30/VMEx40
4200306	630305	Bag foot in stainless steel, 165×270mm	VMEx30/VMEx40/VMEx50
4200312	630605	Yoke with fixed feet, (2x) 85×200mm, SS	VMEx30/VMEx40
4200315	630655	Yoke 400mm with adjustable feet, SS	VMEx30/VMEx40
4200318	630705	Flat suction foot, 100×250mm, SS	VMEx30/VMEx40
4200320	630715	Flat suction foot, 140×205mm, SS	VMEx30/VMEx40
4200325	640655	Yoke 400mm with adjustable feet, SS	VMEx30/VMEx40/VMEx50
4200244	610205	Flat suction foot with V-gasket, Ø270mm	VMEx60
4200246	610235	Flat suction foot, Ø270mm	VMEx60

Item number	Specification	Description	Comment
4200250	610305	Bag foot in stainless steel, 180×370mm	VME60/VME80
4200257	610445	Single hook, with safety lock, SS	VME60/VME80
4200267	610605	Yoke 400mm with adjustable feet, SS	VME60/VME80
4200279	610705	Flat suction foot, 200×320mm, SS	VME60/VME80
4200282	610715	Flat suction foot, 200×290mm, SS	VME60
4200289	620305	Bag foot in stainless steel, 205×460mm	VME100/VME120
4200293	620605	Yoke 500mm with adjustable feet, SS	VME100/VME120

Accessories

Item number	Specification	Description	Comment
4201718	630285	Quick release for suction head st/stVM30	VME30 / VME40 / VME50
4201722	630295	Quick release, suction foot st/st VM30-5	VME30 / VME40 / VME50
4202476	630270SS	Adapter plate - SS	VME30 / VME40 / VME50
4202482	630350SS	Bottom swivel SS	VME30 / VME40 / VME50
4202520	630800SS	Angle adaptor 90 deg, SS	VME30 / VME40 / VME50
4200309	630425	Parking hook VM30-50, stainless steel	VM30-50 (VM100-140), Stainless steel version VME30 / VME40 / VME50
4202525	630811SS	Handle, SS, for angle adaptor	VME30 / VME40 / VME50
4201320	610285	Fast coupling, SS upper part VM60-230	VME60 / VME80 / VME100 / VME180
4201326	610295	Fast coupling, SS lower part VM60-230	VME60 / VME80 / VME100 / VME180
4202179	610350SS	Bottom swivel, SS	VME60 / VME80
4200254	610425	Parking hook VM60-100, stainless steel	VM60-100 (VM160-200), Stainless steel version VME60 / VME80 / VME100
4302450	610810SS	610810 in stainless steel	VME60 / VME80
4202323	620810SS	Angle adaptor for VM100, 90 deg, SS	VME100 / VME120
4202325	620811SS	Handle for angle adaptor SS	VME100 / VME120

Air tubes

Item number	Specification	Description	Comment
4201783	630912	Pur EC air hose Ø38mm, 15m	Ex II(i) 2 G/D T6 For use in: Zone 1 2 21 22
4201781	630908	Joint for connecting 2x 630905/630911	
4201481	610912	PUR EC Air Hose Ø55mm, L=15m	Ex II(i) 2 G/D T6 For use in: Zone 1 2 21 22
4201479	610908	Joint for connecting 2x 610905/610911	
4201784	630915	Reducing piece 52/38mm	

Air filters for vacuum pump

Item number	Specification	Description	Comment
4201487	610926	Air filter 610921 - SS	
4202258	610927SS	Air filter large model - SS	

Electric vacuum pumps

Item number	Specification	Description	Comment
4303324		ATEX Pump medium - Zone 2/22, Vacuum flow 160m ³ /h, Max 42% vacuum	
4303325		ATEX Pump large - Zone 2/22, Vacuum flow 235m ³ /h, Max 45% vacuum	
4303326		ATEX Pump large - Zone 1/21, Vacuum flow 200m ³ /h, Max 45% vacuum	

Ejector

Item number	Specification	Description	Comment
4200211	680204	Low flow ejectorATEX-ejector pump, max vacuum 60%, flow 86 m ³ /h	
4200212	680208	Medium flow ejectorATEX-ejector pump, max vacuum 60%, flow 172 m ³ /h	
4200213	680212	High flow ejectorATEX-ejector pump, max vacuum 60%, flow 258 m ³ /h	

Ejector accessories

Item number	Specification	Description	Comment
4202005	680330	Vacuum regulator 1"	
4202009	680380	Manual feed pressure valve	
3101602	759828	Vacuum gauge	
4202014	680420	Manual feed pressure valve	

Lift tubes

Item number	Specification	Description	Comment
TBD	631840	Lift tube Ø100mm/2,5m for VMEx30	
TBD	631841	Lift tube Ø100mm/4,0m for VMEx30	
4201189	632840	Lift tube Ø120mm/2,5m for VMEx40	
TBD	632841	Lift tube Ø120mm/4,0m for VMEx40	
TBD	634840	Lift tube Ø140mm/2,5m for VMEx50	
TBD	634841	Lift tube Ø140mm/4,0m for VMEx50	
TBD	616840	Lift tube Ø160mm/2,5m for VMEx60	
TBD	616841	Lift tube Ø160mm/4,0m for VMEx60	
TBD	618840	Lift tube Ø180mm/2,5m for VMEx80	
TBD	618841	Lift tube Ø180mm/4,0m for VMEx80	
TBD	620840	Lift tube Ø200mm/2,5m for VMEx100	
TBD	620841	Lift tube Ø200mm/4,0m for VMEx100	
TBD	623840	Lift tube Ø230mm/2,5m for VMEx120	
TBD	623841	Lift tube Ø230mm/4,0m for VMEx120	
TBD	625840	Lift tube Ø250mm/2,5m for VMEx180	
TBD	650840	Lift tube Ø300mm/2,5m for VMEx270	

Jib cranes and overhead crane systems components

Item number	Specification	Description	Comment
4200767	1LRAV2/80SS	Stainless steel wall jib crane L=2000 mm, max load capacity 80 kg	
4200773	1LRAV3/60SS	Stainless steel wall jib crane L=3000 mm, max load capacity 60 kg	
4200778	1LRAV4/40SS	Stainless steel wall jib crane L=4000 mm, max load capacity 40 kg	
4200829	1LRSV3/80USS	Stainless steel underbraced wall jib crane L=3000 mm, max load capacity 80 kg	
4200830	1LRSV4/60USS	Stainless steel underbraced wall jib crane L=4000 mm, max load capacity 60 kg	
4200345	161590	Stainless steel column for LRAV-crane, H=3610 mm	
4200346	162090	Stainless steel column for underbraced LRSV-crane, H=3200 mm	
4203062	161010	Pump shelf 760×55×29 mm, stainless steel	
4203062	161013	Rotation stop, stainless steel	

Appendix I

Inspection record. Keep the last page empty for copying in case records run out.



Inspection record

Update the inspection record after each yearly inspection.

Date:	Stamp of approval
Signed:	
Next inspection date:	
Date:	Stamp of approval
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TAWI

Inspection record

Update the inspection record after each yearly inspection.

Date:	Stamp of approval
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