

# TAWI



CE

## User guide for TAWI VacuEasylift

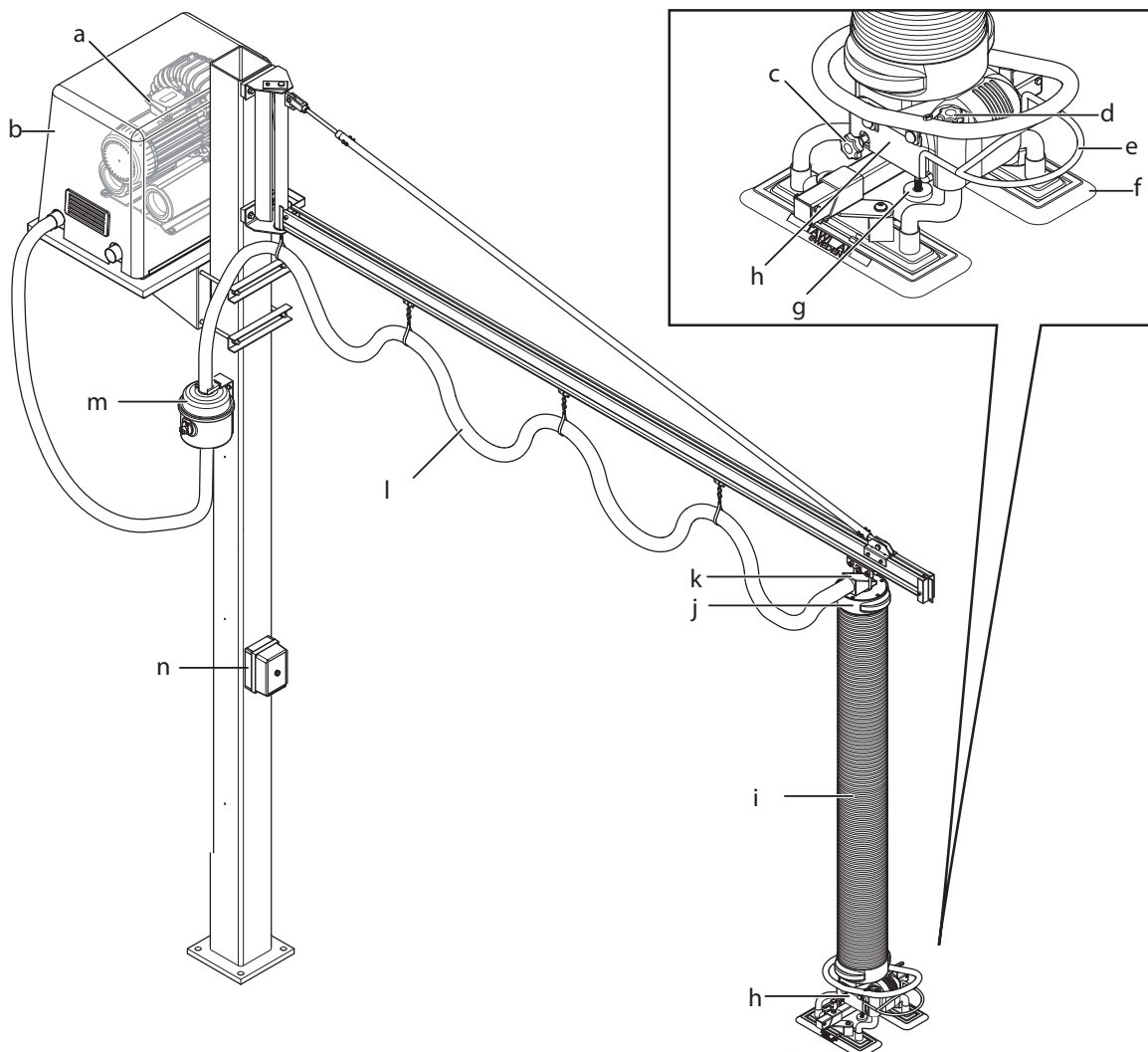
# 1 Overview

<sup>TAWI</sup> VacuEasylift is a line of lifters that lift and lower loads using vacuum. <sup>TAWI</sup> VacuEasylift 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: VM0/40/50/60/80/100/120/180/270 This chapter presents an overview illustration of the lifters and a table containing characteristics of the different models.



- The VM60 model is used for all illustrations in this manual. Your model may differ in appearance.
- Mounting the pump on a pump shelf or with a silencing hood is optional.



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

This table presents information about each model.

Model	VM30	VM40	VM50	VM60	VM80	VM100
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)	73	76	76	76	76	78
Noise level, In operation (dB)	73	75	75	78	78	79

Model	VM120	VM180	VM270
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)	78	78	78
Noise level, In operation (dB)	79	79	79

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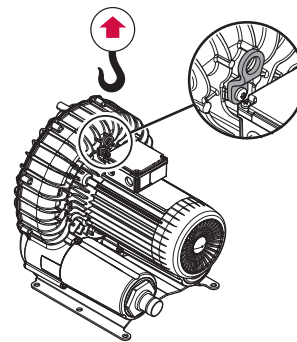
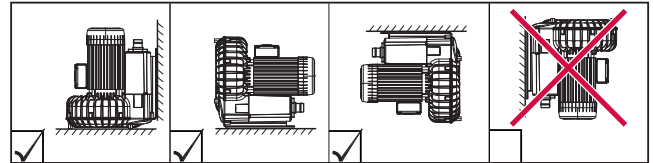
The max lifting capacity specified above are valid for standard configurations of the lifters. Check the sticker on the lifter for applicable max load.

## 2 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.

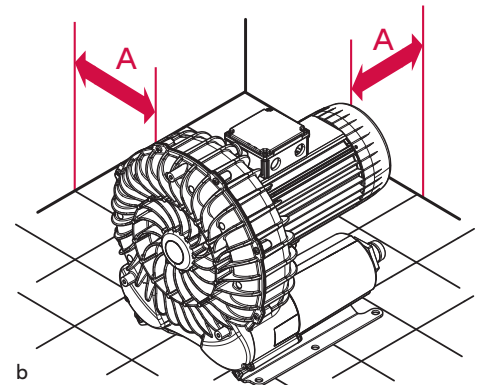
### Install vacuum pump

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



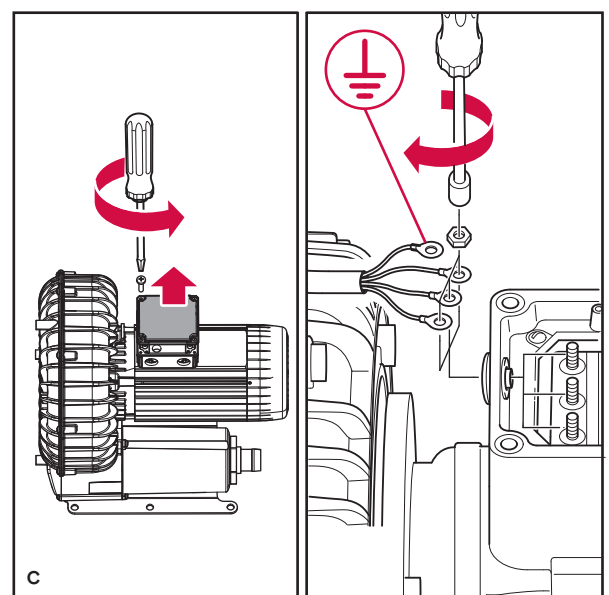
a

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



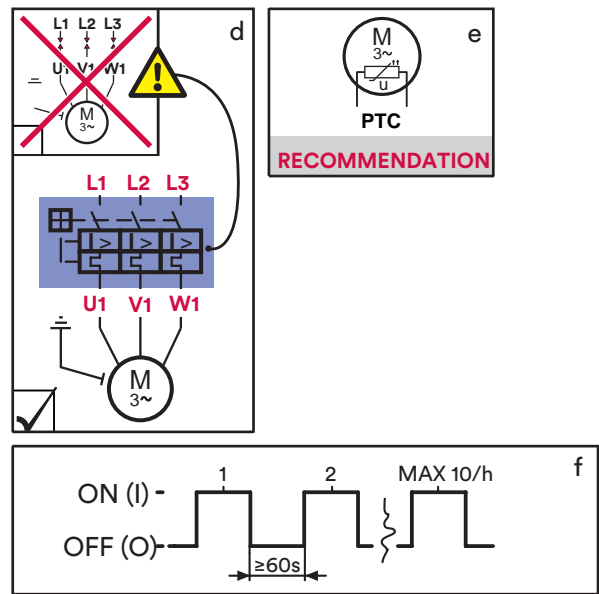
b

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.

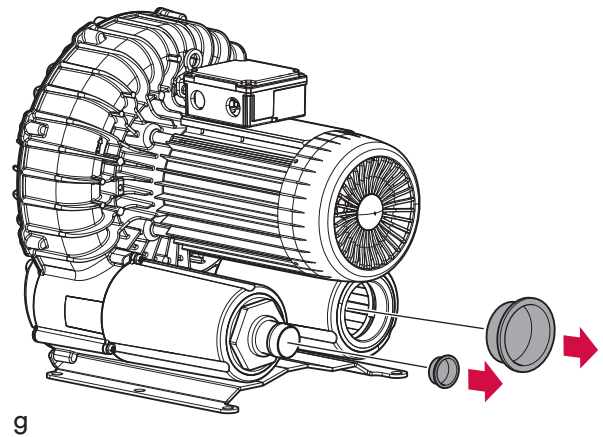


c

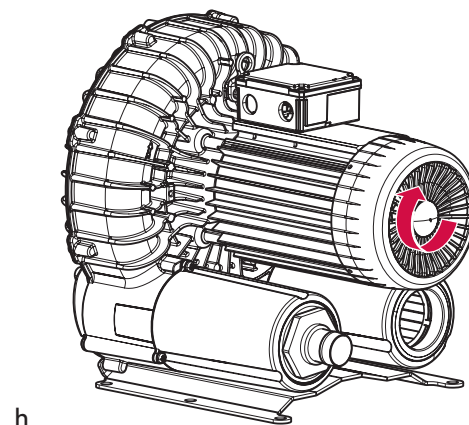
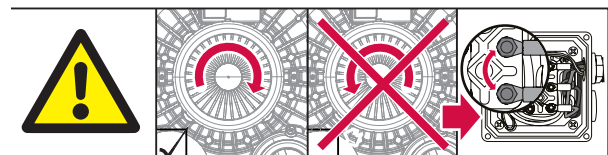
4. TAWI strongly recommends that the PTC is connected to a thermal relay for overheating protection (e). Wait at least 60 seconds and let the fan stop before turning it on again (f).



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



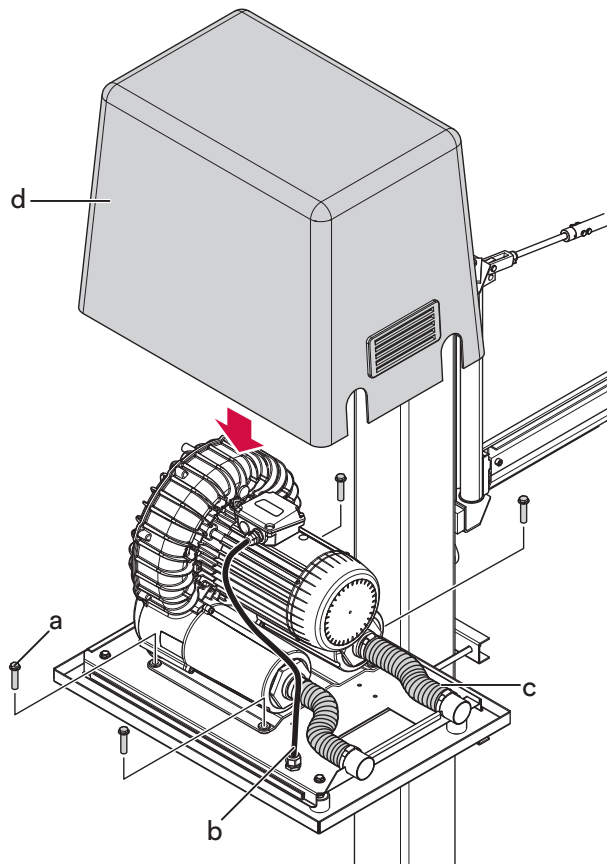
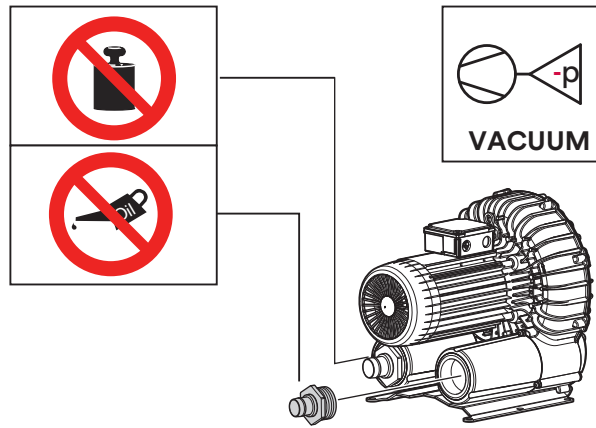
6. Verify function of the vacuum pump and that it rotates in the clockwise direction (h). If the pump rotates in the anti-clockwise direction, switch electrical phases and test the pump again.



## Install silencing hood

To reduce sound emissions from the pump, a silencing hood can be mounted around the vacuum pump (optional accessory).

1. Mount the provided outlet reducing socket in the vacuum pump pressure outlet. Do not use oil or put external load on sockets or inlets or outlets.
2. Mount the vacuum pump on the base plate with the four provided bolts (a).
3. Pull the electrical cable through the cable entry and connect to the pump (see *Install vacuum pump on page 4*) (b).
4. Connect the inlet hose from the baseplate to the vacuum pump inlet reducing socket with hose clamps (use a torque of min 5 Nm) (c).
5. Connect the outlet hose from the baseplate to the vacuum pump outlet reducing socket with hose clamps (use a torque of min 5 Nm) (c).
6. Mount the silencing hood on the base plate. Verify that the outlet is not blocked and that there is enough space for air to flow freely around the silencing hood (>100 mm, all directions) (d).
7. Verify that the inlet and outlet hoses are correctly connected by referring to the sticker on the silencing hood.

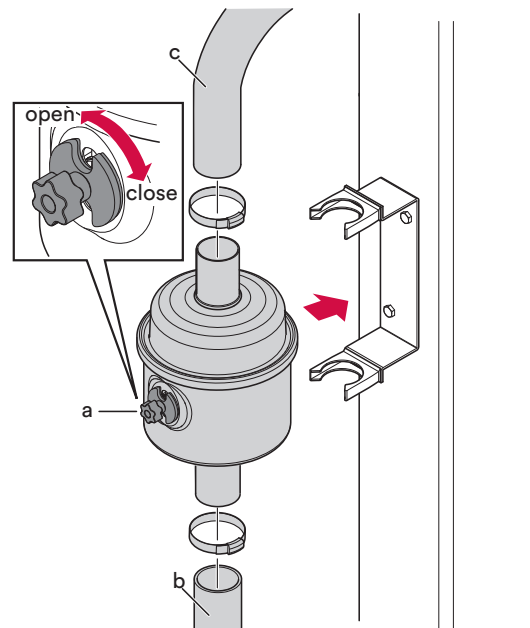


- Electrical installation may only be carried out by an authorised electrician.
- Do not switch or change the heat resistant pressure hose on the base plate. Use of another hose than the one provided by TAWI may cause it to melt and cause permanent damage to the vacuum pump.
- Do not mount any additional hoses on the silencing hood air outlet. This may cause the pump to overheat.
- The silencing hood must not be modified in any way.

## 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).
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).

VM0/40/50 come with a reducing socket which is placed inside the filter inlet. The filter inlet and outlet are marked with an arrow.



- 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.

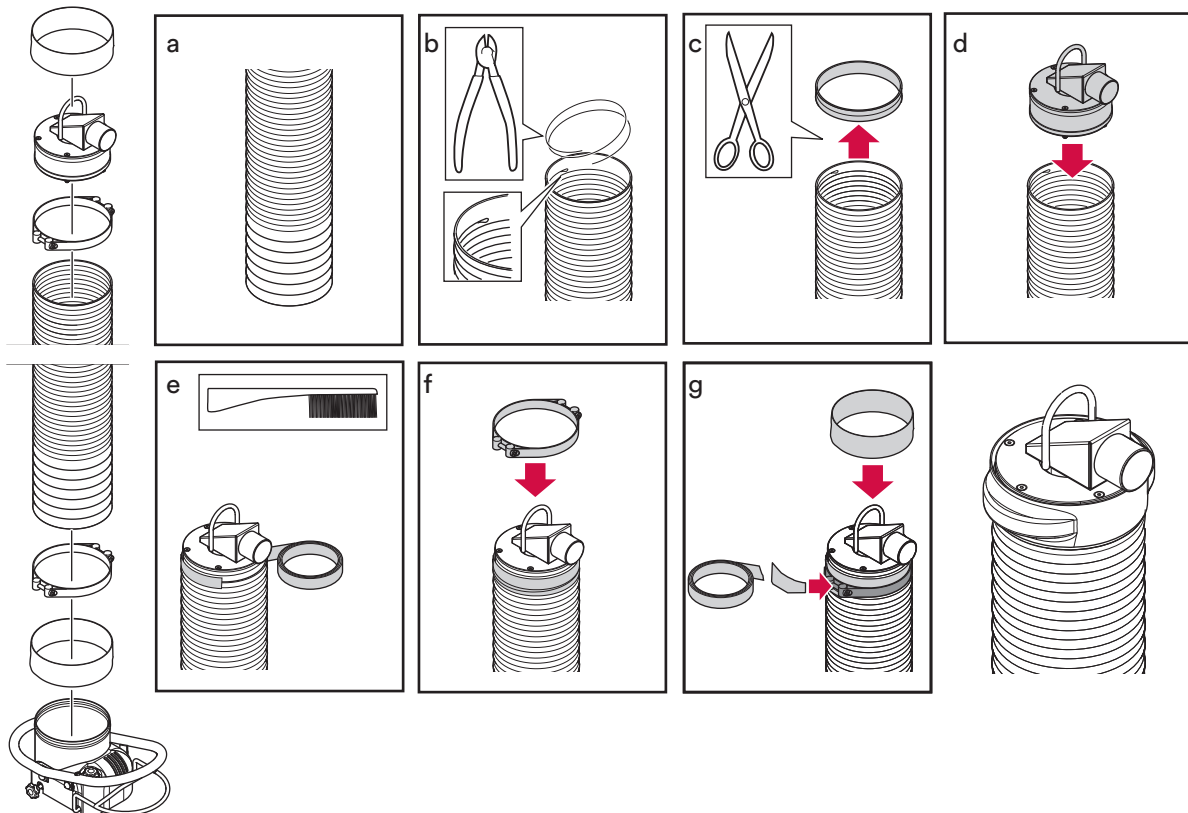


# Shorten or change lift tube

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

## Mount top swivel

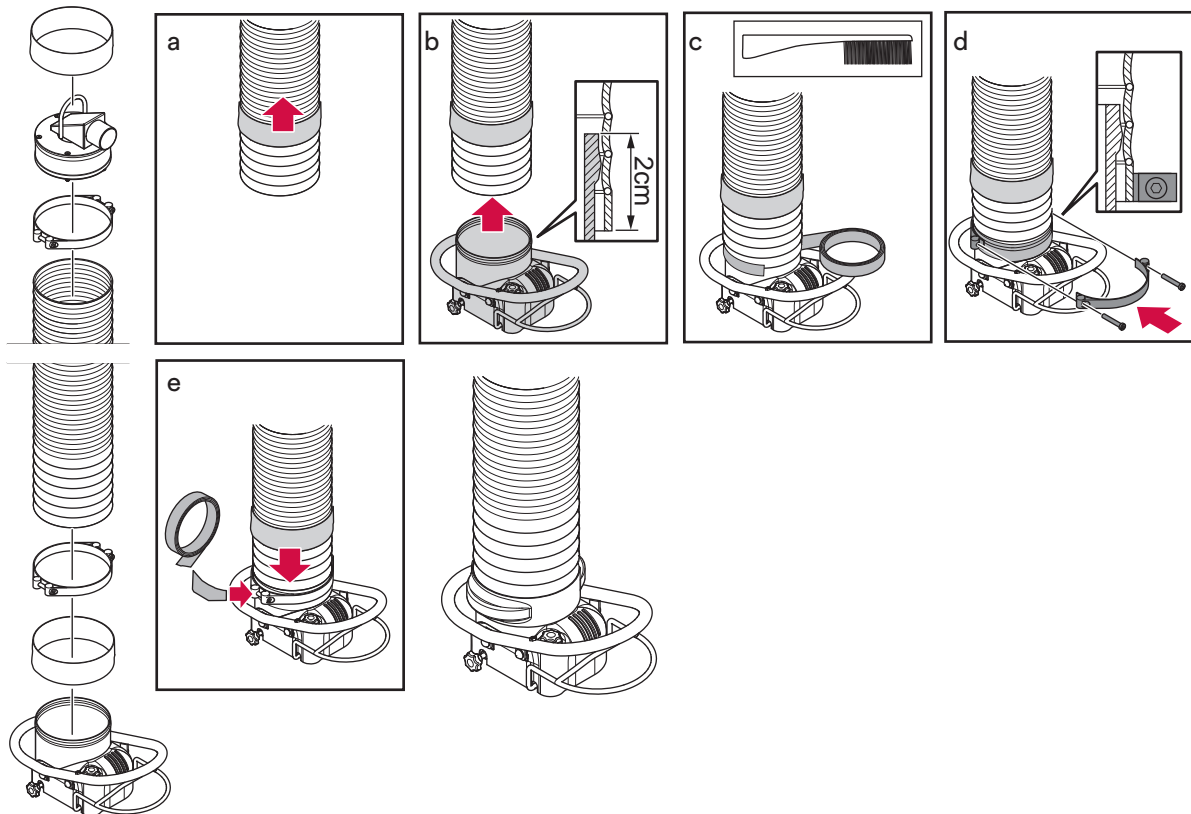
1. For VM60-80: Identify which end of the tube is the lower, reinforced part. For VM100-270 the complete tube is reinforced (a).
2. Start at the top of the tube. Cut off two complete spiral windings from the end (three windings for models VM100-270) (b).
3. Pull out the spiral carefully. Take care not 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 VM100-270) (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 (VM60-80: 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.





## Mount suction head

1. On the suction head side: repeat steps 1-5 from *Mount top swivel* on page 8. 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 VM100-270) (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.



Model	VM30-50	VM60-80	VM100-270
No. of clamps	Two clamps (top swivel) One clamp (suction head)	One power clamp	Two power clamps
Torque	>6 Nm	>18 Nm	> 20 Nm



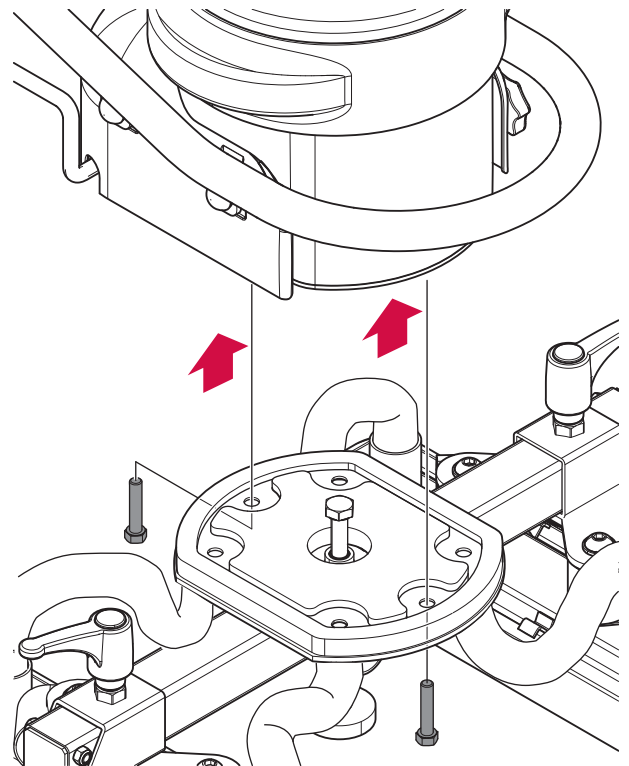
- Use protective eye wear.
- These instructions must be carefully followed. Failure to do so may cause the unit to fall down and cause bodily injuries.



- The 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 VacuEasylift. TAWI must authorize all modifications of the lift tube.

## Install suction foot and touch bolt

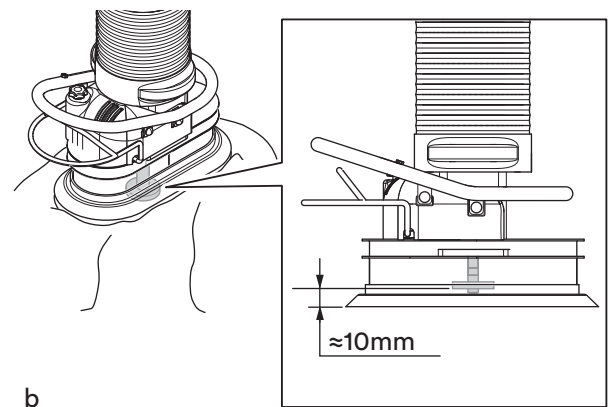
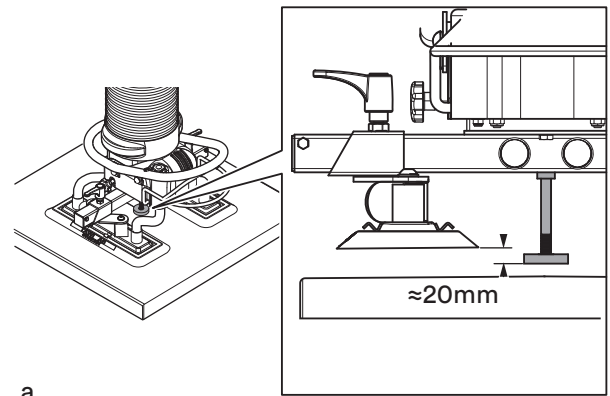
1. Fit the suction foot or quick change attachment with two or four M6 (VM30-120) or M8 bolts (VM180/270) directly to the suction head. Use a torque between 2-3 Nm for the bolts.



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).



3. If the quick change attachment is used, install a suitable suction foot, see *Change suction foot, quick release* on page 17.
4. Verify that the suction foot is securely fastened to the suction head.



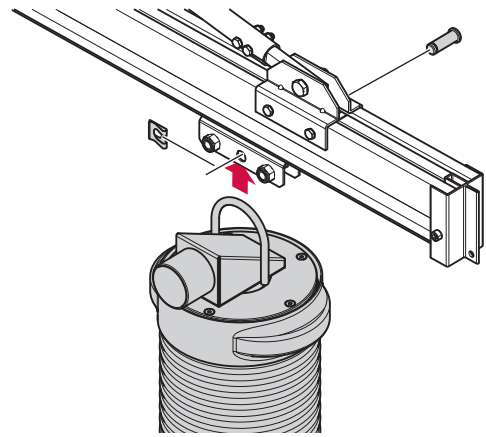
- Make sure to use the correct torque for the bolts when installing the suction foot. Do not over- or undertighten. Air leakage may occur otherwise, reducing lifting capacity.
- If the quick release attachment is used, the touch bolt must be removed.



- 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 lifter in crane system

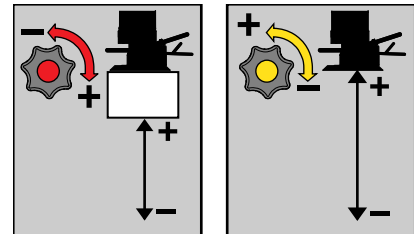
1. Suspend the lift tube from the top swivel in the crane system or jib crane.
2. Adjust suspension so that there is at least 10 cm between the floor and the lowest part of the suction foot.
3. Verify that the lift unit hangs and moves freely so that unnecessary wear is avoided.
4. Verify that the crane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



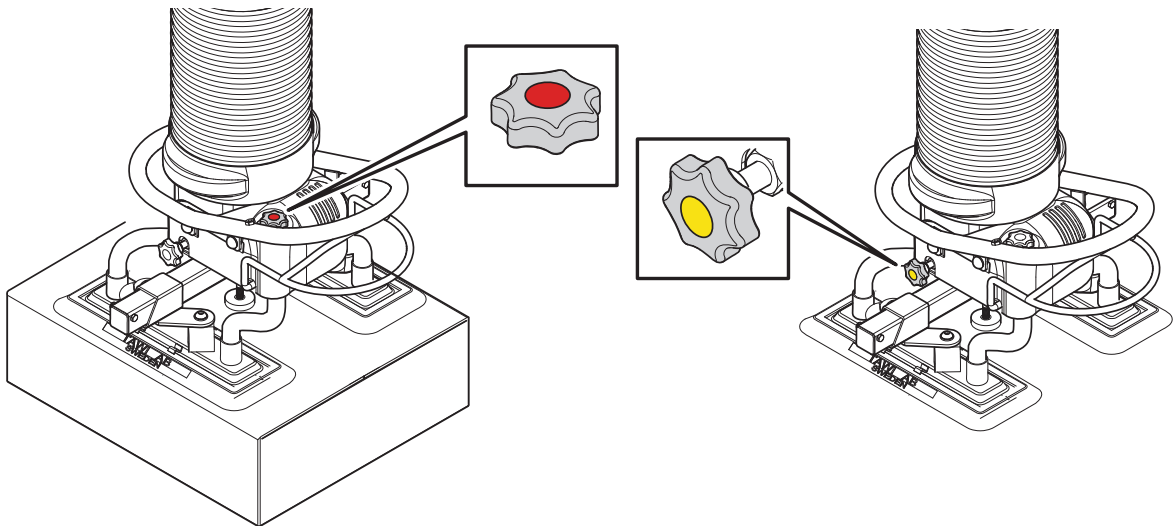
## Adjust load balance

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.

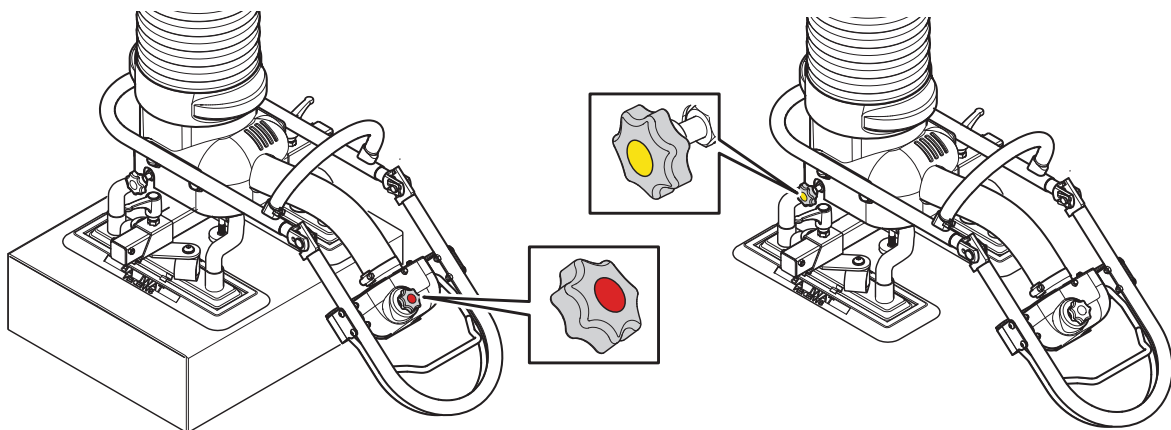
1. Press the main switch to turn the power on.
2. Balance the unit **WITH LOAD**: Turn the red knob carefully until the balance position is reached.
3. Balance the unit **WITHOUT LOAD**: Loosen the lock nut and turn the yellow knob carefully until the balance position is reached. Tighten the lock nut.



- 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).



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



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.



- 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 TAWI VacuEasylift 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.

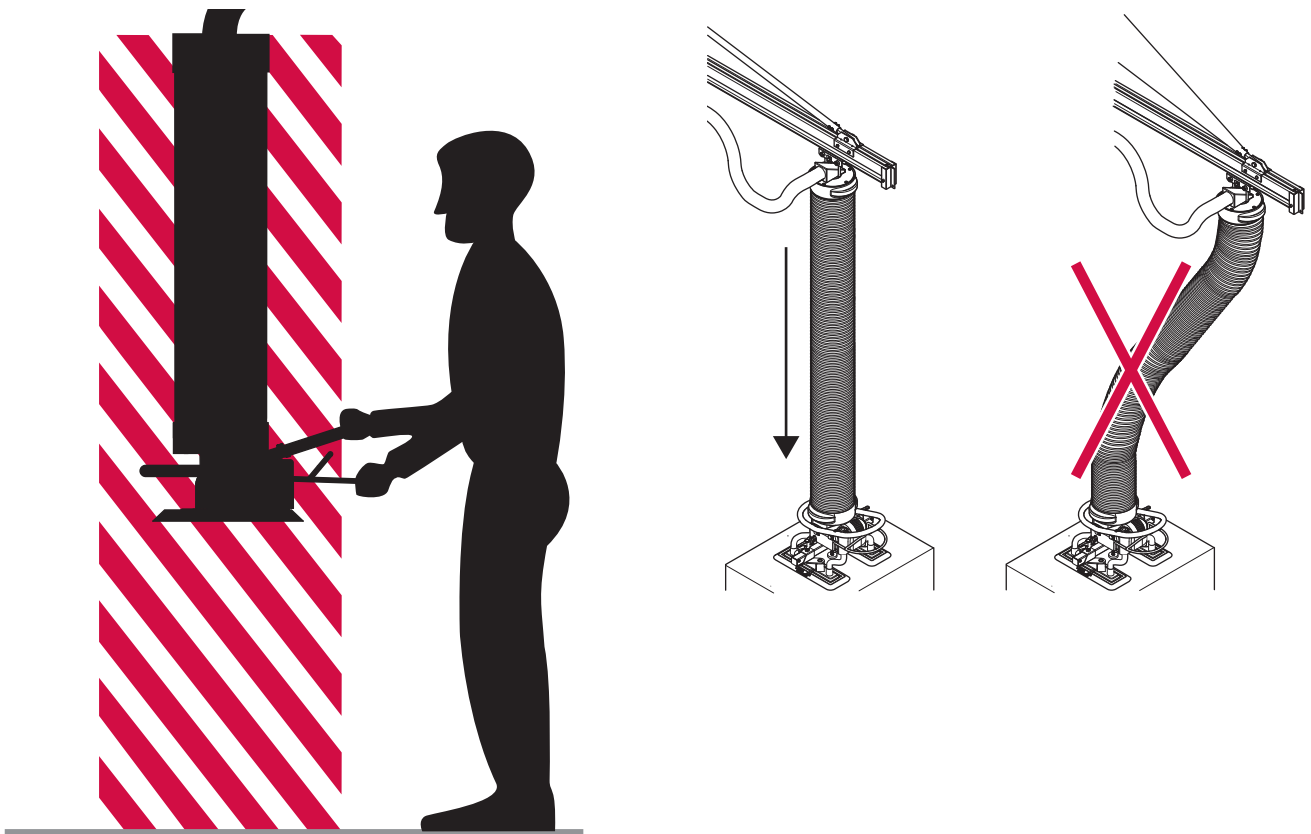
# 3 User instructions

This chapter describes how to operate <sup>TAWI</sup> VacuEasylift.

## Start lifter

Review and perform relevant inspections: see 6 Service & maintenance on page 19.

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.



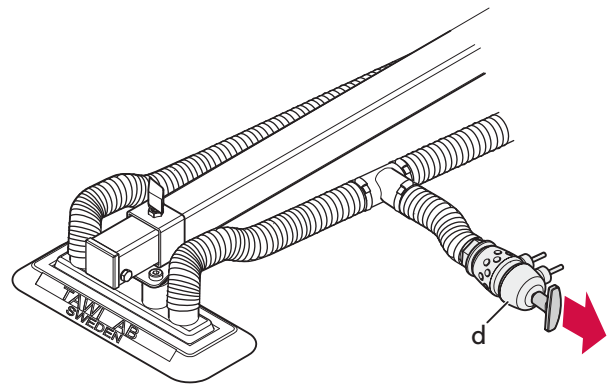
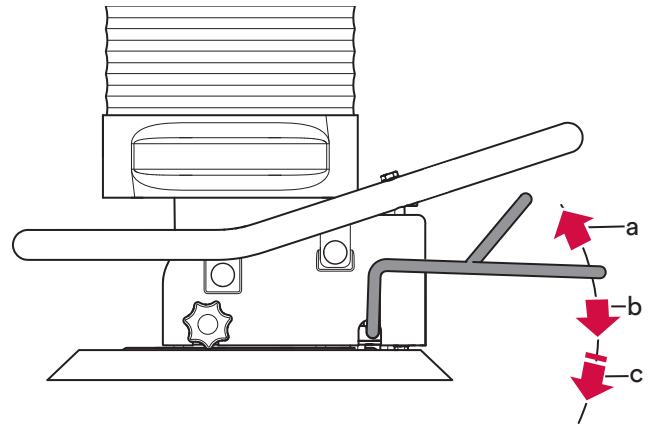
- A damaged electrical cable could cause electrical shock.
- The operator must be trained on the product and all instructions in the manual must be followed.
- When in operation the operator must not place his head above the unit.
- When in operation the operator must not be under a hanging load.
- The 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 19. The filter has a control valve to reduce the lifting speed when handling light loads, see *Install filter unit and air tubes on page 7*.

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 (optional accessory; compatible with model VM0/40/50/180/270 and VM60/80/100/20 with flex handles): by pressing the operating handle right to the bottom and pulling the release valve handle at the same time (d).



- 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.

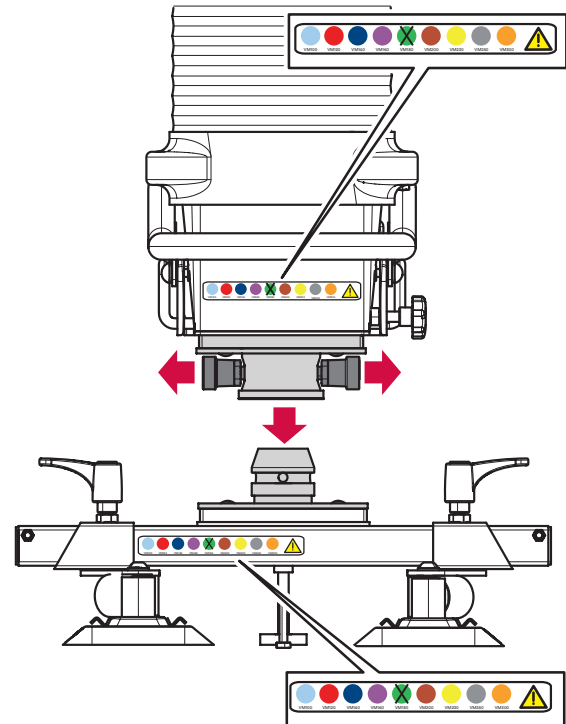


- Check the lifter for safe functionality prior to each use, for instructions, see 6 Service & maintenance on page 19.

## 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 10.
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.

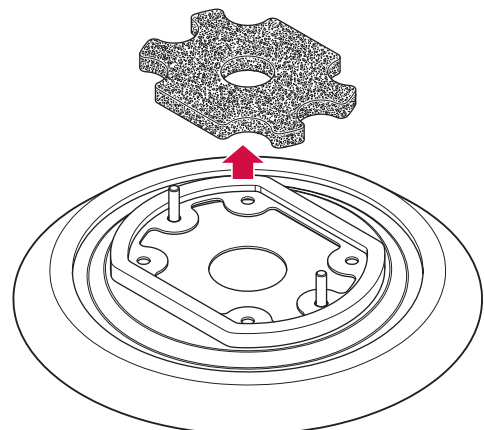


Note the colour code system for safe assembly of lift unit to suction foot/accessory. Each colour corresponds to a specific VacuEasylift model. **ONLY PARTS WITH MATCHING COLOUR CODE MARKING MAY BE ASSEMBLED!** Some suction feet/accessories may be used with several lift models (indicated by the colour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

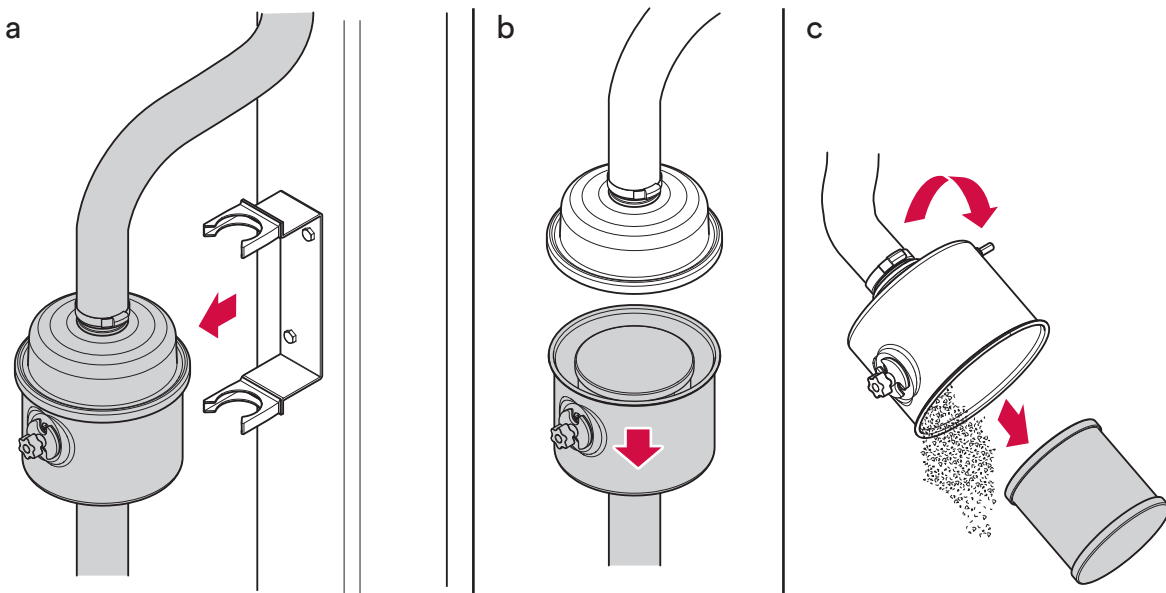
1. Remove the suction foot.
2. Carefully clean the air filter using reduced compressed air.
3. The filter inset **MUST** be replaced when dirty or damaged.
4. Fit the suction foot with two or four M6/M8 bolts to the suction head, see *Install suction foot and touch bolt* on page 10. Use a torque between 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.



- 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.

## 4 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 or [info@tawi.com](mailto:info@tawi.com). 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.

# 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.

## 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 II.

# 5 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 Install vacuum pump on page 4.
	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 Shorten or change lift tube on page 8). Check filter unit for leakage.
	Dirty vacuum pump filter	→ Clean filter inset, see Clean vacuum pump filter on page 18.
	Dirty suction foot filter	→ Clean suction foot filter, see Clean suction foot filter on page 17.
	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 Install vacuum pump on page 4.
	Suction foot installed incorrectly	→ Remove suction foot and clean the foot filter. Refit suction foot, see Install suction foot and touch bolt on page 10. 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 Shorten or change lift tube on page 8). Check filter unit for leakage.
	Filter unit control valve open	→ Adjust filter unit control valve, see Install filter unit and air tubes on page 7.
Operating handle too high or low	Wrong adjustment of load balance	→ Adjust load balance without and with load, see Adjust load balance on page 12.

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.