# Operating instructions

# FIPALIFTmax

SH.MAX.160.250
SH.MAX.160.500
SH.MAX.160.750
SH.MAX.200.250
SH.MAX.200.500
SH.MAX.200.750

# EG-Konformitätserklärung

EU Declaration of Conformity

challenge accepted

**Fipa GmbH**
**Freisinger Straße 30**
**85737 Ismaning**

Hiermit erklären wir, dass das Produkt FIPALIFTmax
*We declare that the product FIPALIFTmax*

**SH.MAX.160.250**
**SH.MAX.160.500**
**SH.MAX.160.750**
**SH.MAX.200.250**
**SH.MAX.200.500**
**SH.MAX.200.750**

folgender einschlägiger Bestimmung entspricht:
*complies with the following relevant provision:*

**Maschinenrichtlinie Nr.: 2006/42/EG**
*Machine directive No.: 2006/42/EG*

Angewandte harmonisierte Normen, deren Fundstellen im Amtsblatt der EU veröffentlicht worden sind:
*Applied harmonized standards, the references of which have been published in the Official Journal of the EU:*

**EN 14238:2010-02 (Krane- Handgeführte Manipulatoren)**

Bevollmächtigter für die Zusammenstellung der technischen Unterlagen:
*Authorized representative for the compilation of the technical documentation:*

**Michael Kaltenecker**
*Director of Products and Solutions*

Diese EG-Konformitätserklärung wurde ausgestellt:
*This EU Declaration of Conformity has been issued:*

**Ismaning, 03.08.2021**
(Ort, Datum)
(Place, date)

**Matthias Scheel**
(CE-Beauftragter der Firma FIPA GmbH)
(CE representative of the company FIPA GmbH)

# Content

**Signs and symbols**

The following symbols are used in these operating instructions to indicate information of special importance:

Attention! Failure to observe this warning may result in damage to material or persons.

Important information.

# 1. INTRODUCTION

The tube lifter FIPALIFTmax is a lifting device whose lifting force and movement are based on vacuum. The device can be adapted to a wide range of applications. It can be used to lift various objects such as boxes, crates, sacks, canisters, barrels, drums and other objects.

The FIPALIFTmax tube lifter has been developed to enable you to work ergonomically and fluidly, lifting and moving heavy loads very easily. It is very time-efficient as there is no need for tedious slinging of the load.

The operating manual contains a description of the safety rules, installation, operation, maintenance and troubleshooting as well as the technical data. Special versions of the FIPALIFTmax tube lifter are not described. Information about these products can be obtained from our Technical Sales Department (+49 89 962489-0).

The delivered device may only be used for lifting objects for which it is designed according to your enquiry and order confirmation. If you intend to use the lifting device for other objects, please contact our Technical Sales Department.

Peripheral systems with which the tube lifter FIPALIFTmax is installed together are not described in these operating instructions. Please refer to the individual descriptions of these system parts.

FIPA is constantly striving to develop and improve the design and construction of its lifting equipment. Therefore, design and technical features are subject to change without notice.

All information in these operating instructions corresponds to the features at the time of publication. Misprints are excepted.

Rainer Mehrer, CEO

# 2. SECURITY

Read these operating instructions carefully before first use and observe the following safety rules. The FIPALIFTmax tube lifter may only be operated and maintained by personnel who have read these operating instructions and fully understood the contents. Hang the operating instructions in an easily accessible place near the tube lifter and point them out to the operators.

**The design and construction of the tube lifter may not be changed under any circumstances without the approval of FIPA GmbH. Only original FIPA accessories and spare parts are to be used. Unauthorised modifications and/or the use of third-party accessories and spare parts may cause serious personal injury during the lifting process and will invalidate the warranty.**

## 2.1. Legend pictograms

Warns of a danger zone. Different pictograms in the warning triangle explain the danger in more detail.

Warns against severe bruising of limbs

Warns against tipping and severe bruising

Warns of suspended load

Advises to wear protective clothing

Indicates to wear safety shoes

Indicates to wear gloves

## 2.2. Reference to residual hazards and risks

| | |
|---|---|
| **Floating loads!** | |
|  | Risk of crushing injuries, shearing injuries and other injuries due to falling or moving parts during transport of the machine or machine parts and during operation.<br>Danger when moving the loads!<br>✓ Do not stand under suspended loads and do not climb on suspended loads!<br>✓ Use suitable lifting gear for transport and suitable load handling attachments that are approved for the weight!<br>✓ Put on personal protective equipment.<br>✓ Carefully move the goods to be transported and pick up the load at the centre of gravity.<br>Persons are not allowed to stay in the transport area. |
| **Moving parts!** | |
|  | Crushing fingers / hands when moving or adjusting the suction plate position, during assembly or operation can lead to injuries.<br>✓ Do not reach between individual suction plates (double rectangular suction foot), quick-change coupling and suction foot or between other components!<br>✓ Mount the vacuum lifter carefully.<br>✓ Do not remove protective enclosures.<br>✓ When moving, keep one hand on the operating head and the other on the material to be transported.<br>Always wear personal protective equipment during assembly and adjustment work! |
| **Falling loads!** | |
|  | Incorrect lifting and premature release of the load before it is fully supported can lead to severe crushing, shearing and impact injuries. Danger from falling loads!<br>✓ Exercise caution when operating the vacuum lifter!<br>✓ Take up load only in the middle.<br>✓ Release the load only when it is fully supported.<br>✓ After changing the suction plates/suction feet, check that the connection has been plugged in correctly.<br>✓ Persons are not allowed to stay in the transport area.<br>Always wear personal protective equipment when working on or with the device! |
| **Manual swivelling / turning of the vacuum cup!** | |
|  | Danger of crushing, shearing and impact injuries when the suction foot is manually turned and swivelled by the suction foot and the material being transported.<br>✓ Be careful when swivelling and rotating the suction foot.<br>✓ When swivelling, keep one hand on the operating head and the other on the material to be transported.<br>Always wear personal protective equipment when working on or with the device! |
| **Danger of retraction!** | |
|  | Danger of injury from being pulled in, caught and cut off during cleaning and maintenance work. Danger from moving and rotating parts.<br>✓ Shut down the unit during maintenance and cleaning work.<br>✓ Always wear personal protective equipment when working on or with the device! |
| **Danger of crushing when operating the device!** | |
|  | Crushing fingers / hands on the fixture or between the component and the fixture can lead to injuries.<br>✓ Exercise extreme caution when operating the device! |

| | |
|---|---|
| | ✓ Always wear personal protective equipment when working on or with the device! |

## 2.3. General safety rules

Please observe the intended use (see chapter 2.4), only this is permissible. Furthermore, it is essential to observe:


The unit must not be operated or serviced by persons who are under the influence of alcohol, drugs that impair perception such as sleeping pills or strong painkillers or other drugs. Other conditions such as circulatory problems or dizziness are also characteristics that lead to the prohibition of the ability to operate this equipment.


It is the responsibility of the operator to ensure that no personal injury can occur during work.


Safety shoes must be worn during operation.


Never be distracted when working with the tube lifter and never distract the operator himself. Accidents can occur due to lack of concentration.


Do not work with loads heavier than the design of the unit.


The tube lifter may only be used to lift loads that are packed in such a way that they do not fall apart when lifted, i.e. are inherently stable.


Do not place the load handling attachment on surfaces that are so slippery that the load could possibly slip away (slip effect).


Take special care when handling sharp-edged objects such as metal sheets. There is a danger of cutting.


Never use the FIPALIFTmax tube lifter to lift loads containing hazardous or explosive substances. It must be ensured beforehand that work can be carried out without danger.


Position the lifting device vertically above the centre of gravity of the object to be lifted.


The tube lifter with a raised load may only be operated in such a way that a fall of the load cannot cause personal injury.


Never guide lifted loads over people. People must not stand under the lifted loads.


Do not set down the lifted load if this may cause injury to persons or damage to objects.


The load suspension device must not be used on people or animals.


Never lift objects for longer than 60 seconds with the load lifting device of the tube lifter. The vacuum pump may overheat and be damaged and/or lose its function.


A lifted load must not be left without supervision or one hand must always remain on the control panel when the load is lifted. The balance function is only intended for use without a load.


The standard hose lifter must not be operated in potentially explosive environments. Various components can generate sparks. A specially modified device is required for this application.


Do not hang the tube lifter on the wall.


The entire manual must be read in detail before installing and commissioning the system and one must familiarise oneself thoroughly with the system.


The tube lifter should only be operated with little hand force on the control handle to avoid violent movements when lifting.


During service and cleaning, the unit must be switched off and secured against being switched on again.

## 2.4. Intended use

**Observe the rules and regulations of your national authorities and institutions for occupational safety and the operation of lifting equipment!**

The FIPALIFTmax tube lifter is used to lift and then set down various transport goods from different industries. In conjunction with interchangeable types of load handling attachments, vacuum-tight and porous loads of max. 144 kg (depending on the combination of lifting tube diameter and pump) may be moved.

The FIPALIFTmax tube lifter and the load handling attachments are part of a complete system consisting of a vacuum pump or side channel compressor, filter unit and vacuum tube. The FIPALIFTmax is attached to a suitable and sufficiently dimensioned crane system.

At the time of placing on the market, the tube lifter FIPALIFTmax is suitable/designed for the following variants of load handling attachments:

| **Designation** | **Item no.** |
|---|---|
| Suction bowl oval 395 x 210 | SH.ACC.MAX.0020 |
| Double rectangular vacuum cleaner | SH.ACC.MAX.0030 |
| Balancer for extended operating heads FIPALIFTmax | SH.ACC.MAX.0080 |
| **Special variants are possible on request and receive a separate conformity!** | |

The respective load handling device must be used for the corresponding goods to be transported.

The FIPALIFTmax tube lifter may only be operated by one person and from the front. The operator must be instructed in the handling of the FIPALIFTmax and must have understood the instruction.

The tube lifter FIPALIFTmax is intended for indoor use. Outdoor use is only permitted after consultation with FIPA.

The tube lifter FIPALIFTmax may only be operated if all safety devices are fully mounted and functional. Intended use also includes observing these operating instructions and carrying out the necessary maintenance work and checks.

## 2.5. Foreseeable misapplications

The FIPALIFTmax tube lifter is not intended for the following applications:

- Handling of components or variants other than those approved by the manufacturer.
- Exceeding the maximum load capacity.
- Shutting off suction plates that fall below the load-bearing capacity.
- Non-centric load pick-up.
- The transport goods are approached at an angle when the transport goods are picked up.
- Laying down and storing the FIPALIFTmax with the bottom of the suction cup facing downwards.
- Use in enclosed spaces with special hazards (e.g. explosion hazard).
- Working outdoors.

- Shooting loads with wet, icy or snow-covered surfaces.
- Operation by untrained personnel.

# 3. PRODUCT DESCRIPTION

## 3.1. Overview of variants

The following tube lifter variants are available. These differ in the diameter of the lifting tube and the handle length. However, the basic function is identical:

*Table 1: Overview of variants of the FIPALIFTmax*

| Article number | Lifting tube Ø [mm]<br>A | Handle length [mm]<br>B | Hose length [mm]<br>C |
|---|---|---|---|
| SH.MAX.160.250 | 160 | 250 | 2300 |
| SH.MAX.160.500 | 160 | 500 | 2300 |
| SH. MAX.160.750 | 160 | 750 | 2300 |
| SH.MAX.200.250 | 200 | 250 | 2400 |
| SH.MAX.200.500 | 200 | 500 | 2400 |
| SH. MAX.200.750 | 200 | 750 | 2400 |

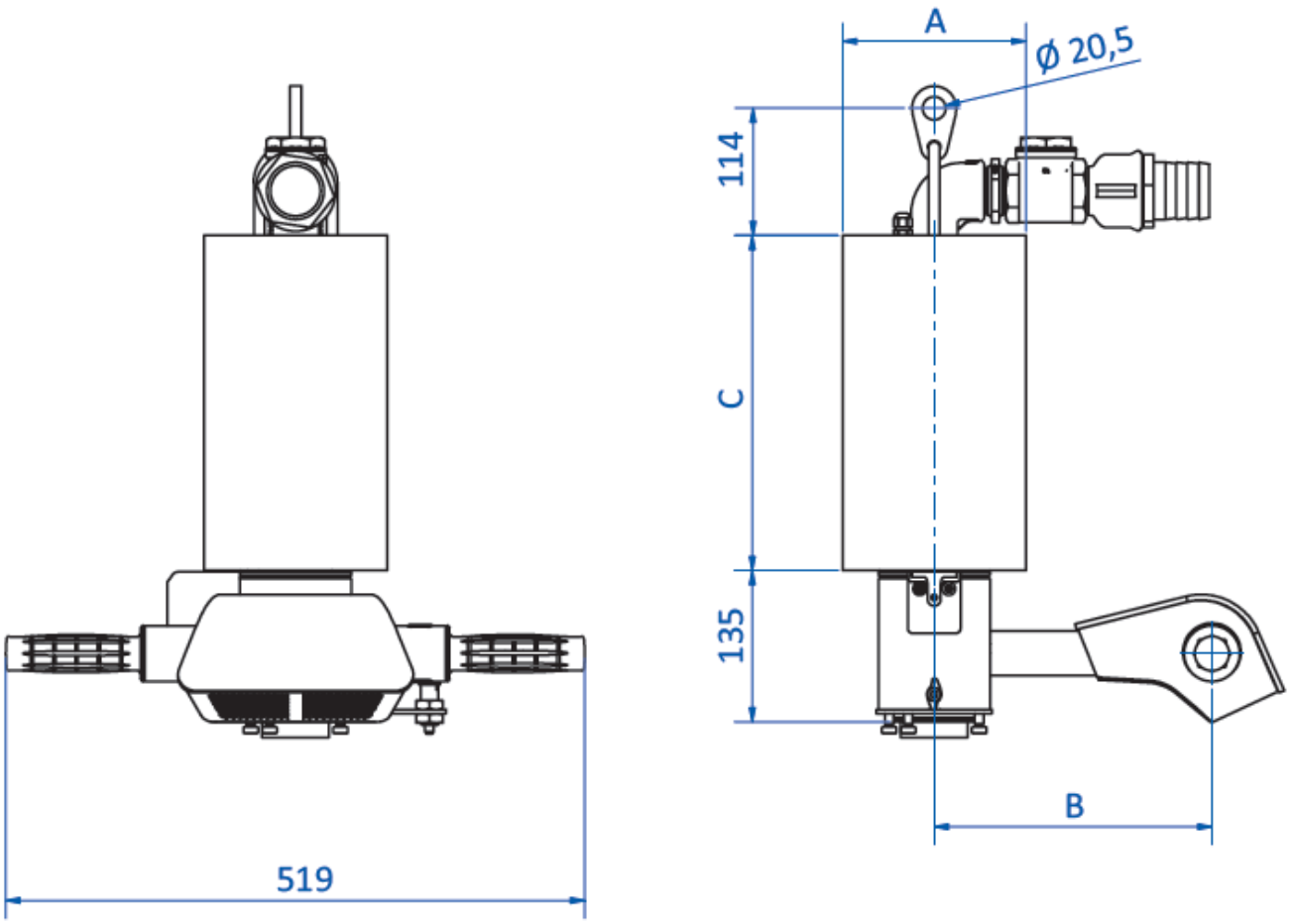



*Figure 1: Dimensions of the:FIPALIFTmax*

## 3.2. Embedding in an overall system

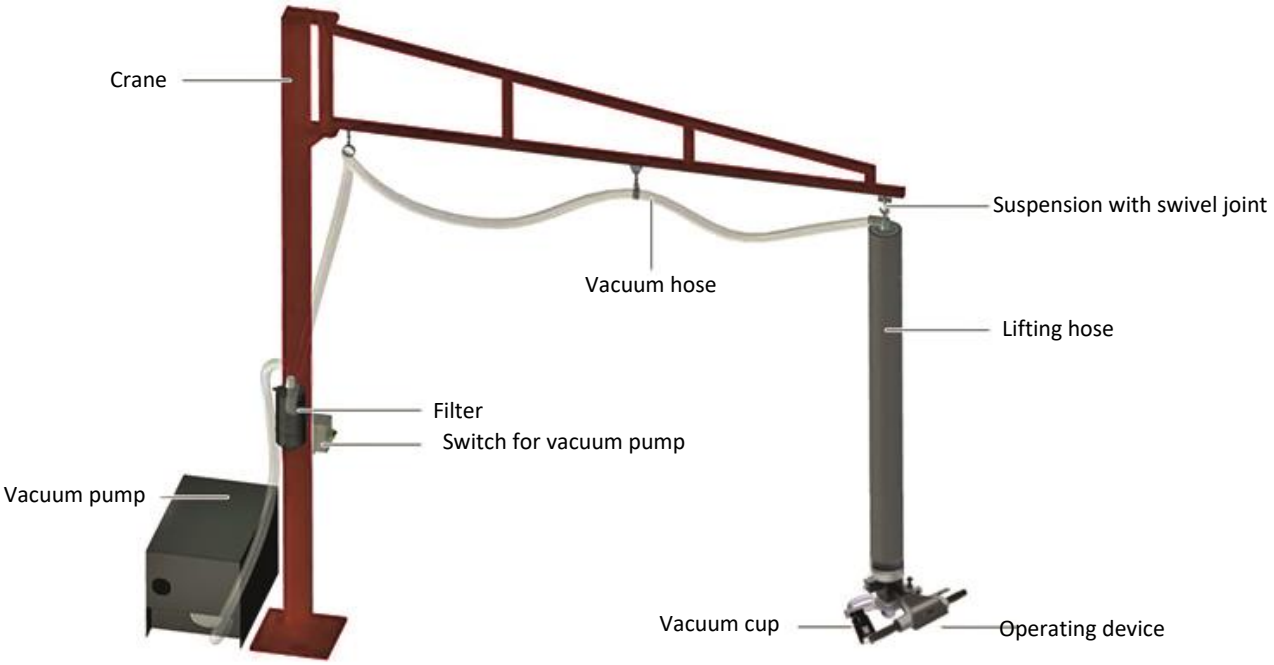



*Figure 2: Exemplary illustration of a tube lifter system and its different components*

FIPA offers pre-assembled tube lifter sets. These consist of a tube lifter and matching vacuum generation:

| Article number | Lifting tube diameter [mm] | Max. Volume flow [m³/h] | Negative pressure [bar] | Load capacity [kg] |
|---|---|---|---|---|
| SH.SET.MAX.160.250.091 | 160 | 91 | -0,35 | 71 |
| SH.SET.MAX.160.500.091 | 160 | 91 | -0,35 | 71 |
| SH.SET.MAX.160.750.091 | 160 | 91 | -0,35 | 92 |
| SH.SET.MAX.160.250.117 | 160 | 117 | -0,35 | 92 |
| SH.SET.MAX.160.500.117 | 160 | 117 | -0,35 | 71 |
| SH.SET.MAX.160.750.117 | 160 | 117 | -0,35 | 71 |
| SH.SET.MAX.160.250.181 | 160 | 181 | -0,45 | 92 |
| SH.SET.MAX.160.500.181 | 160 | 181 | -0,45 | 92 |
| SH.SET.MAX.160.750.181 | 160 | 181 | -0,45 | 71 |
| SH.SET.MAX.160.250.236 | 200 | 236 | -0,45 | 71 |
| SH.SET.MAX.160.500.236 | 200 | 236 | -0,45 | 92 |
| SH.SET.MAX.160.750.236 | 200 | 236 | -0,45 | 92 |
| SH.SET.MAX.200.250.091 | 200 | 91 | -0,35 | 112 |
| SH.SET.MAX.200.500.091 | 200 | 91 | -0,35 | 112 |
| SH.SET.MAX.200.750.091 | 200 | 91 | -0,35 | 144 |
| SH.SET.MAX.200.250.117 | 200 | 117 | -0,35 | 144 |

| Article number | Lifting tube diameter [mm] | Max. Volume flow [m³/h] | Negative pressure [bar] | Load capacity [kg] |
|---|---|---|---|---|
| SH.SET.MAX.200.500.117 | 200 | 117 | -0,35 | 112 |
| SH.SET.MAX.200.750.117 | 200 | 117 | -0,35 | 112 |
| SH.SET.MAX.200.250.181 | 200 | 181 | -0,45 | 144 |
| SH.SET.MAX.200.500.181 | 200 | 181 | -0,45 | 144 |
| SH.SET.MAX.200.750.181 | 200 | 181 | -0,45 | 112 |
| SH.SET.MAX.200.250.236 | 200 | 236 | -0,45 | 112 |
| SH.SET.MAX.200.500.236 | 200 | 236 | -0,45 | 144 |
| SH.SET.MAX.200.750.236 | 200 | 236 | -0,45 | 144 |

## 3.3. Scope of delivery

The following parts are included in the scope of delivery:

| Designation | Number |
|---|---|
| Hose lifter FIPALIFTmax various Versions | 1 |
| Filter versch. Versions | 1 |
| Side channel compressor various Versions | 1 |
| Vacuum hose D38 or D50 (depending on version) for connecting side channel blower and filter | 2m |
| Set of connecting material for hose between side channel straightener and filter (hose thread nipples and hose clamps) | 1 |
| Set of connecting material for hose between filter and hose lifter (hose thread nipples and hose clamps) | 1 |

The vacuum hose from the filter to the tube lifter is not included in the scope of delivery. This must be ordered separately under item number SH.ACC.ALL.0022 in the required length.

# 4. INSTALLATION AND COMMISSIONING

It must be ensured that the tube lifter delivered corresponds to the delivery note. If any parts are missing, please contact our Technical Sales Department. Many problems during installation and

of the test run can be avoided if this manual is read carefully before installation. For safety reasons, it is essential to have in-depth knowledge of the equipment. The tube lifter FIPALIFTmax is used together with an electric vacuum pump or a side channel compressor. Please follow the instructions for the pumps carefully.

## 4.1. Safety instructions for installation

Installation may only be carried out by a competent person.

The person responsible for installing the FIPALIFTmax tube lifter must ensure that the suspension structure (e.g. the FIPA crane system or the FIPA jib crane or others) is sufficiently dimensioned to hold the dead weight of the tube lifter, including maximum load plus a sufficient safety factor.

The electrical installation of the pump must be carried out by a trained electrician.

## 4.2. Installing the hose lifter

The lifting unit is attached to the suspension eye.

Make sure that the fastening elements are sufficiently dimensioned and, if necessary, adequately secured.

When the lifting unit has been hooked in, the load handling attachment should be at least 100 mm above the ground surface. If the lifting unit is closer to the floor, the hose must be shortened or the suspension system must be raised. If the lifting unit is further from the ground, a longer hose must be used or the suspension system lowered.

It must be ensured that the tube lifter can still be reached by the operating personnel in the highest position and that the desired working height is achieved. If this is not the case, the length of the lifting hose must be adjusted and/or the height of the suspension changed.

## 4.3. Selection of the load handling attachment

When selecting the load handling attachment, it must be ensured that in the event of a failure of the vacuum supply, the lifting tube is lowered first and only then is the load discharged. This is ensured by ensuring that the ratio of the area of the lifting tube to the active suction area of the load handling attachment has a safety factor of at least 2.5.

The load handling attachments from FIPA, which are optionally available, ensure perfect and safe functioning.

## 4.4. Selection of the vacuum pump/side channel compressor

The selection is highly dependent on the nature of the load to be lifted, lifting tests may be necessary. Please contact our Technical Sales Department (+49 89 962489-0) for the correct design.

The pumps/side channel blowers are not included in the scope of delivery and must be ordered separately. The following pumps/side channel blowers are available from FIPA and approved for the FIPALIFTmax:

*Table 2: Technical data of the approved side channel blowers*

| **Item no.** | **SKV. D. 91-1.5 *** | **SKV. D. 117-2.2*** | **SKV. D.181-4.0 *** | **SKV. D. 236-5.5 *** |
|---|---|---|---|---|
| **Suction capacity at 50 Hz** [m3/h] | 91 | 117 | 181 | 236 |
| **Suction capacity at 60 Hz** [m3/h] | 110 | 137 | 218 | 285 |
| **Differential pressure** [mbar] | -350 | -350 | -450 | -450 |
| **Voltage supply at 50 (60) Hz** [V] | Δ 230 (265),<br>Y 400 (460) | Δ 230 (265),<br>Y 400 (460) | Δ 230 (265),<br>Y 400 (460) | Δ 230 (265),<br>Y 400 (460) |
| **Current consumption at 50 (60) Hz** [A] | n.a. | n.a. | Δ 14,05 (14,03),<br>Y 8,12 (8,1) | Δ 11.1 (11.0),<br>Y 6.4 (6.35) |
| **Rated power at 50 Hz** [kW] | 1,5 | 2,2 | 4 | 5,5 |
| **Rated power at 60 Hz** [kW] | 1,7 | 2,6 | 4,8 | 6,5 |
| **Noise level at 50 Hz** [dB(A) | 69,7 | 70,8 | 70,5 | 73,4 |
| **Noise level at 60 Hz** [dB(A) | 72,8 | 72,8 | 72,5 | 75,4 |
| **Operating temperature** [°C] | - 15 - 40 | - 15 - 40 | - 15 - 40 | - 15 - 40 |
| **Weight** [kg] | 25 | 40 | 53 | 70 |
| * Article number not complete | | | | |

## 4.5. Installation of the electric vacuum pump

The electrical installation must only be carried out by a trained electrician and in accordance and compliance with local regulations and the vacuum pump operating instructions.

The vacuum pump must be placed as close as possible to the lifting unit in order to keep the length of the vacuum hose as short as possible. If the tube lifter FIPALIFTmax is to lift loads as quickly as possible, it is particularly important that the vacuum hose between the vacuum pump and the lifting unit is not too long. A long vacuum hose reduces the lifting unit's ability to use the full capacity of the vacuum pump. It is recommended that the hose between the vacuum pump and the lifting unit should not be longer than 30 m. If a longer hose is necessary, please contact our Technical Sales Department.

If several FIPA tube lifters are installed, the vacuum pumps must be labelled to make it clear which pump is connected to which tube lifter.

Furthermore, the operating instructions of the vacuum pump/side channel blower must be observed.

**The unit may only be put into operation after a qualified electrician or electrician has installed a motor protection device. If a motor protection device is not installed, there is a risk of fire!**

## 4.6. Installation of the vacuum hose and air filter for vacuum generation

The air filter is installed in an easily accessible place and then clearly marked to which lifting device it is connected. Then hook the vacuum hose into the suspension system on which the lifting device is mounted (e.g. the FIPA crane system, the FIPA slewing crane or others). Attach the vacuum hose to the upper swivel joint of the lifting unit and to the air filter. See also Figure 2.

Then also attach the vacuum hose between the air filter and the vacuum pump.

The arrow on the air filter points in the direction in which the hose leads to the vacuum pump.

Ensure that the entire length of the vacuum hose cannot be pinched or come into contact with anything that could damage it.

## 4.7. Test operation and initial acceptance

### 4.7.1. Leakage test

Switch on the vacuum source and lift a load with a surface that is completely impermeable to air. Allow the load to hang freely from the lifting device and listen for hissing noises throughout the device, all pipes and joints to ensure that no leaks have occurred during installation.

### 4.7.2. Function test

Lift a load with an air-impermeable surface of about 5 kg. Let the load hang freely on the tube lifter and then switch off the vacuum pump.

The load and lifting unit should now slowly sink down to the ground. If this is not the case, please contact our Technical Sales Department.

### 4.7.3. Full load test

Lift a load with a completely air-impermeable surface and the maximum permissible weight for this design.

The load should now be lifted slowly by the tube lifter without any obstacles. If the load is not lifted, check under section 0TROUBLESHOOTING whether one of the errors mentioned is present.

### 4.7.4. Labelling

After the correct installation of the FIPALIFTmax tube lifter on a suitable crane system, a plate with the maximum permitted load must be attached to the control unit. The maximum permitted load must correspond to the maximum load of the installed tube lifter, as well as the maximum load of the lifting system.

Please note that the warning signs are not supplied by FIPA.

# 5. OPERATION

Before starting any handling operations with the FIPALIFTmax, the pump for the corresponding tube lifter must be started.

The vacuum in the lifting tube can be regulated by turning the right-hand handle.

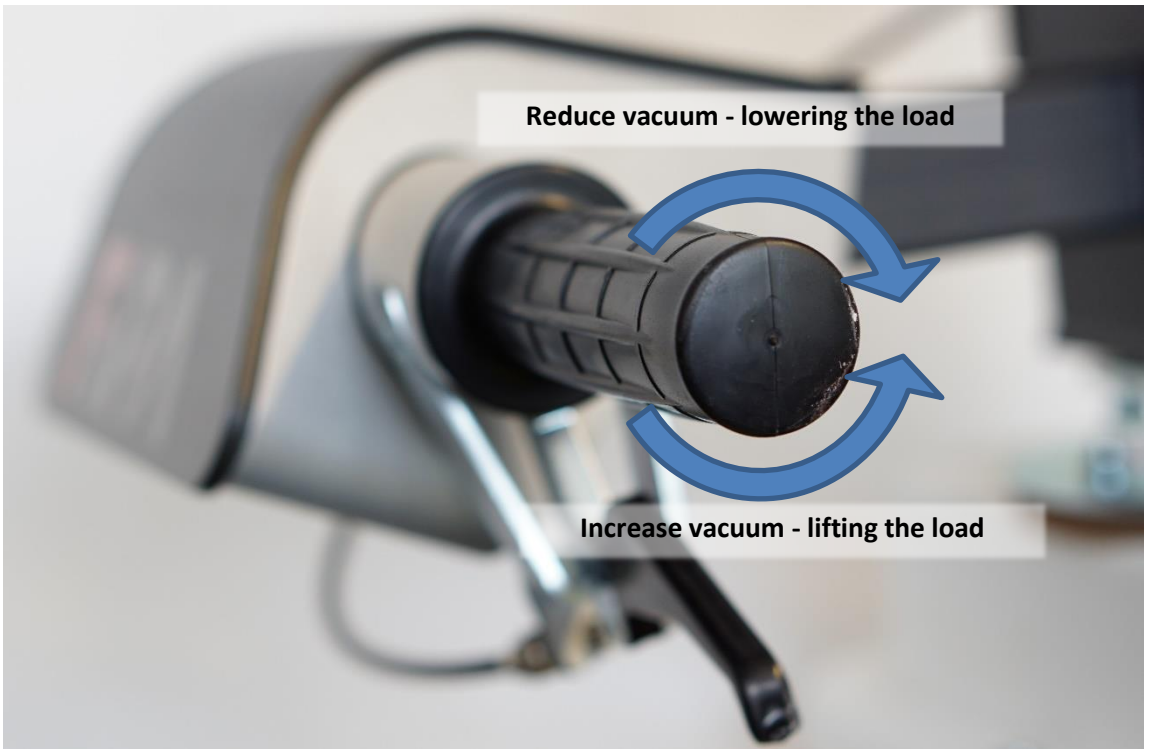



*Figure 3: Turning handle of the FIPALIFTmax*

Turning the handle anticlockwise (see Figure 3) increases the vacuum in the lift tube and the FIPALIFTmax rises. Turning the handle clockwise decreases the vacuum in the lift tube and the FIPALIFTmax lowers. This makes it easy to adjust the height of the FIPALIFTmax.

## 5.1. Lifting a load

With the vacuum pump running, the tube lifter FIPALIFTmax is picked up with both hands by the handles. Then it is guided to the load and placed on the load from above with the vacuum cup. Make sure that the vacuum cup sits cleanly and without leaks on the load. Then slowly turn the right handle anti-clockwise (see Figure 3). This increases the vacuum level and the volume flow in the vacuum cup, the load is picked up and lifted. If there is sufficient vacuum in the lifting tube and the vacuum cup, the load can be moved to its destination.

## 5.2. Setting down a load

Once the load has reached its destination, the vacuum in the lifting tube can be reduced by carefully turning the right handle clockwise (see Figure 3) and the load lowers. It is important not to turn the handle jerkily or too quickly to avoid damaging the load. When the load has reached its destination, the load can be released quickly and easily by pressing the "quick-release" lever (see Figure 4).

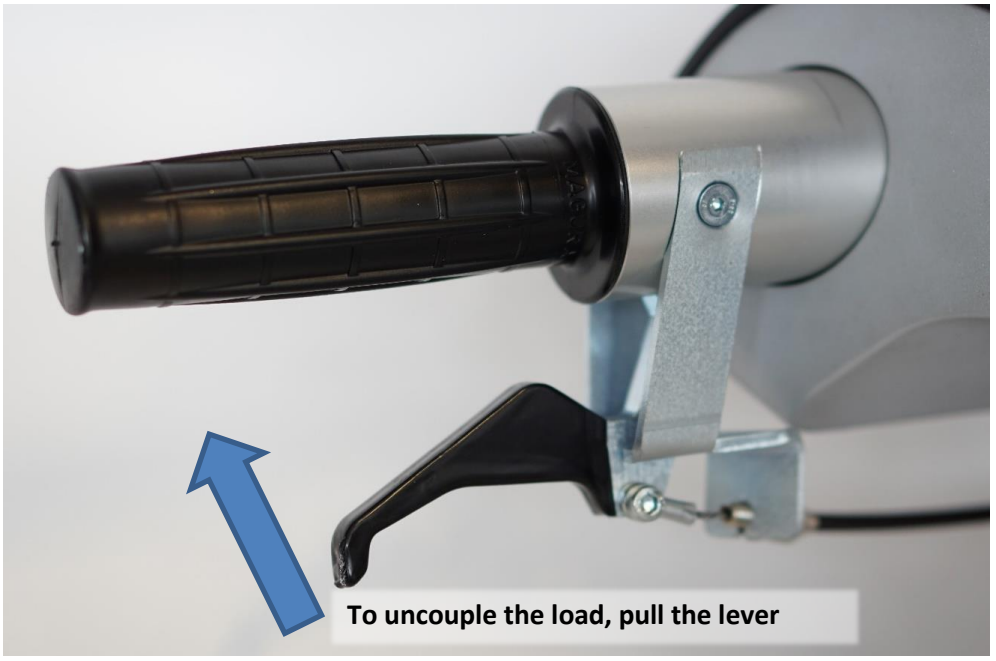



*Figure 4: Turning handle of the FIPALIFTmax with hand lever for uncoupling the load (quick-release)*

## 5.3. Exchange of the load handling attachment

To replace the load handling attachment, the load handling attachment is first lifted with the help of the FIPALIFTmax to a safe storage place and deposited there.

Then pull the locking lever upwards at the connection point of the FIPALIFTmax and the load handling attachment. While the locking lever is pulled, the FIPALIFTmax is turned clockwise (see Figure 5). The lock between the load handling attachment and the FIPALIFTmax is released and the FIPALIFTmax can be lifted off the load handling attachment.

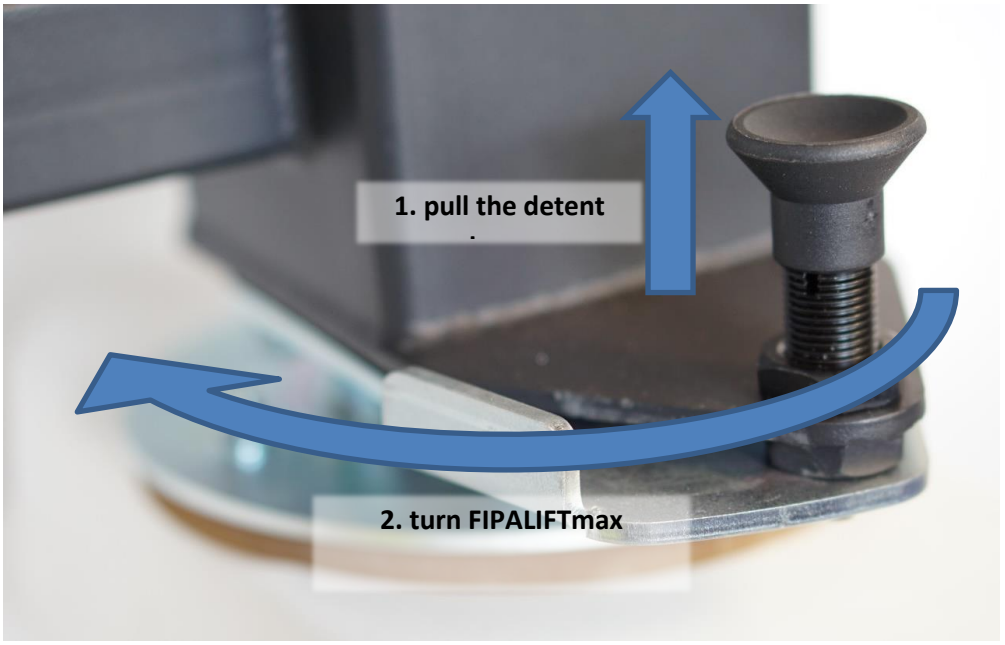



*Figure 5: Locking lever for locking the load handling attachment*

# 6. MAINTENANCE

## 6.1. General maintenance

The maintenance instructions must be followed carefully to ensure that the equipment operates safely and that the lifting characteristics are not impaired.

If faults are detected in the system, they must be rectified immediately before the FIPALIFTmax tube lifter is put into operation again. If faults are not rectified immediately, consequential damage and/or personal injury may result.

During service work, the unit must be switched off and secured against being switched on again.

Only FIPA original spare parts are to be used for maintenance and repair work. FIPA original spare parts are matched to the necessary loads and forces of the tube lifter; the use of other spare parts can lead to serious defects and invalidate the warranty.

The maintenance must be recorded in writing in a corresponding maintenance booklet. This is not supplied by FIPA and must be prepared by the operator.

| | Interval | | |
|---|---|---|---|
| | Daily | Weekly | Quarterly |
| **Check filter:** (for **dusty and dirty ambient conditions**)<br>Shake out the filter and clean it with the hoover. Damaged filtersor filters that can no longer be cleaned must be replaced. | X | | |
| **Check hose guides**<br>The vacuum hose and the lifting tube must not be jammed in other parts and/or connections. Check whether the vacuum hose and the lifting tube are hanging freely. If not, free the affected hose and check it for damage. If a hose is damaged, the tube lifter must not be operated until the affected hose is replaced. | X | | |
| **Check filter** (under **normal ambient conditions**)<br>Shake out the filter and clean it with the hoover. Damaged filtersor filters that can no longer be cleaned must be replaced. | | X | |
| **Function test** (as described in chapter 4.7.2) | | X | |
| **Check vacuum cup**<br>Check the vacuum cup on the load handling attachment inside and outside for damage. If the/one vacuum cup is damaged, replace it immediately. The tube lifter must not be operated until the vacuum cup has been replaced. | | X | |
| **Check the lifting tube for damage**<br>Check the lifting hose for damage. If the lifting hose is damaged, replace it immediately. Do not operate the tube lifter until the tube has been replaced. | | X | |

| | | | |
|---|---|---|---|
| **Check lifting tube length**<br>The lifting tube gets longer over time - this is a normal ageing phenomenon. Check the length of the lifting tube so that the vacuum cup does not touch the floor. If the vacuum cup does touch the floor, see chapter 4.2 | | X | |
| **Check suspension eye and crane system**<br>Check that the suspension eye and the crane system to which the FIPALIFTmax tube lifter is attached are in perfect condition.<br>If any parts are damaged, do not use the tube lifter until the fault has been rectified. Please contact our Technical Sales Department. | | | X |
| **Check fastening system**<br>Check that bolts and nuts of the fastening system are tight and secured if necessary | | | X |
| **Check vacuum guide**<br>Check whether the vacuum hose and the lifting tube are airtight. (see chapter 4.7.1) | | | X |

## 6.2. Shortening the lifting tube

The hose can only be shortened at the upper end where the swivel joint is attached.

To do this, detach the protective cover on the side of the suspension from the tube, remove the black band and unscrew the lifting tube from the plastic adapter. Measure the length of the lifting tube by which it must be shortened to give the FIPALIFTmax tube lifter the correct height above the ground. Do not cut against the direction of the spiral but with it (see Figure 6).

*Figure 6: Schematic diagram of shortening the lifting hose*

- Step 1: Cut the lifting tube to length and cut away the spiral wire.
- Step 2: Cut away excess fabric and orange tape. If you proceed as shown in the illustration, the spiral wire will not come off the fabric.
- Step 3: Remove about 20 mm of orange tape from the spiral wire.
- Step 4: Remove about 2 turns of white string from the cut end.
- Step 5: Screw the lift tube back onto the plastic adapter.
- Step 6: Then wrap the lifting tube and the plastic adapter with reinforced adhesive tape (FIPA item number SH.SPP.ALL.0034). The tape must be stretched tightly.
- Step 7: Pull the protective cover back over the hose.

# 7. TROUBLESHOOTING

***Error:*** *The load is not lifted or it is lifted slower than usual*

**Is the air filter clogged?**
Shake out the filter and clean it with the hoover. Replace the filter if it is damaged.

**Is the filter unit cover cap correctly installed?**
Tighten the cap correctly.

**Does the system have any leaks?**
**Place the vacuum cup on an airtight flat board or similar. Turn the control handle all the way up (full vacuum) and check the vacuum hose, connections, air filter, upper swivel joint, lifting tube, control unit and suction cup for hissing noises.**
Seal leaks or replace leaking components.

**Is there any contamination in the vacuum cup?**
Remove impurities from the vacuum cup.

**Is the vacuum hose pinched somewhere?**
Loosen clamp and check vacuum hose

**Is the load to be lifted too heavy? Check that the weight corresponds to the lifting capacity of the FIPALIFTmax tube lifter supplied.**
This load cannot and must not be lifted. Reduce load if necessary

**If the load is not lifted, this may be due to the fact that no vacuum is generated in the lifting tube and/or vacuum cup (suction cup). The cause is usually a leak in the load or in the lifting device. Check the system for leaks. In particular, check the connection between the vacuum cup and the load.**
Eliminate leakage

***Error****: The load is lifted very slowly at the beginning, but faster as the lifting height increases.*

**Is there a leak in the lifting tube?**
Be sure to replace the lifting hose.

**Is there a leak in the vacuum hose?**
Seal leaks or replace vacuum hose.

***Error: The*** *load is not lowered slowly during the power failure test.*

**Check according to chapter 6, weekly maintenance interval**
Please contact our technical sales department.

***Error****: The vacuum pump does not start.*

Please contact the person responsible for the electrical installation or our Technical Sales Department.

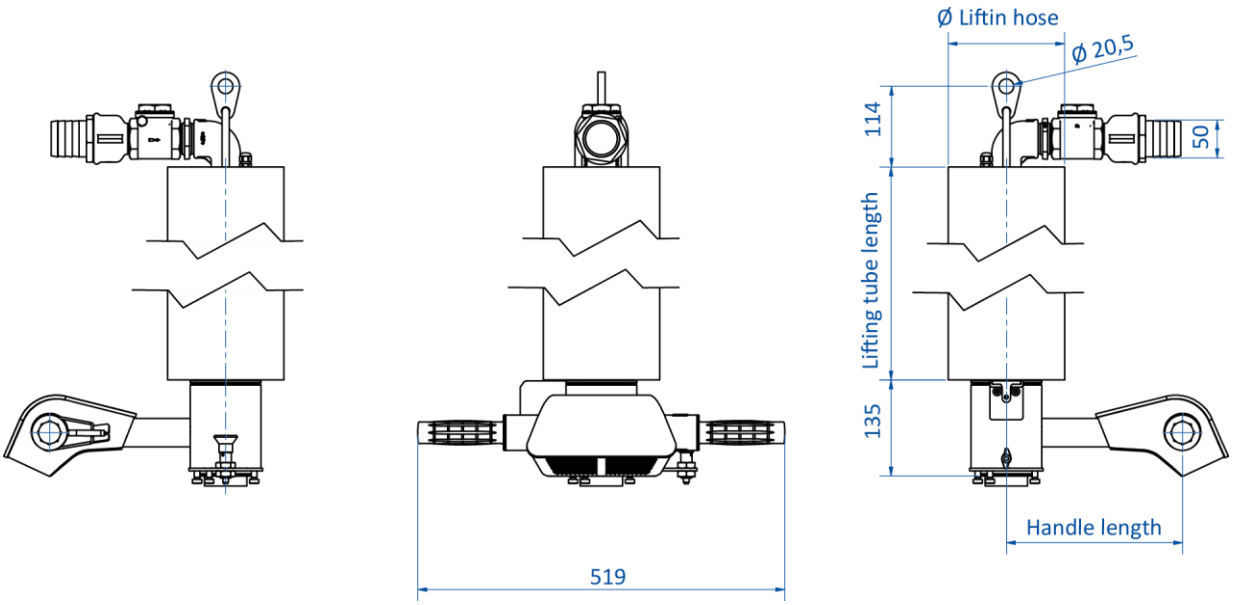
***Error****: Extraneous noises can be heard from the vacuum pump*

Please decommission the vacuum pump and contact our Technical distribution on

# 8. Disposal

In case of decommissioning and disposal, please observe the local disposal regulations.

# 9. SPECIFICATIONS




| Item no. | Ø Lifting hose [mm] | Lifting tube length [mm] | Hub [mm] | Handle length [mm] | Max. Volume flow [m3/h] | Max. Lifting force [kg] |
|---|---|---|---|---|---|---|
| SH.SET.MAX.160.250.091 | 160 | 2.300 | 1.860 | 250 | 91 | 71 |
| SH.SET.MAX.160.250.117 | 160 | 2.300 | 1.860 | 250 | 117 | 71 |
| SH.SET.MAX.160.250.181 | 160 | 2.300 | 1.860 | 250 | 181 | 92 |
| SH.SET.MAX.160.250.236 | 160 | 2.300 | 1.860 | 250 | 236 | 92 |
| SH.SET.MAX.160.500.091 | 160 | 2.300 | 1.860 | 500 | 91 | 71 |
| SH.SET.MAX.160.500.117 | 160 | 2.300 | 1.860 | 500 | 117 | 71 |
| SH.SET.MAX.160.500.181 | 160 | 2.300 | 1.860 | 500 | 181 | 92 |
| SH.SET.MAX.160.500.236 | 160 | 2.300 | 1.860 | 500 | 236 | 92 |
| SH.SET.MAX.160.750.091 | 160 | 2.300 | 1.860 | 750 | 91 | 71 |
| SH.SET.MAX.160.750.117 | 160 | 2.300 | 1.860 | 750 | 117 | 71 |
| SH.SET.MAX.160.750.181 | 160 | 2.300 | 1.860 | 750 | 181 | 92 |
| SH.SET.MAX.160.750.236 | 160 | 2.300 | 1.860 | 750 | 236 | 92 |
| SH.SET.MAX.200.250.091 | 200 | 2.400 | 1.930 | 250 | 91 | 112 |
| SH.SET.MAX.200.250.117 | 200 | 2.400 | 1.930 | 250 | 117 | 112 |
| SH.SET.MAX.200.250.181 | 200 | 2.400 | 1.930 | 250 | 181 | 144 |
| SH.SET.MAX.200.250.236 | 200 | 2.400 | 1.930 | 250 | 236 | 144 |
| SH.SET.MAX.200.500.091 | 200 | 2.400 | 1.930 | 500 | 91 | 112 |
| SH.SET.MAX.200.500.117 | 200 | 2.400 | 1.930 | 500 | 117 | 112 |
| SH.SET.MAX.200.500.181 | 200 | 2.400 | 1.930 | 500 | 181 | 144 |
| SH.SET.MAX.200.500.236 | 200 | 2.400 | 1.930 | 500 | 236 | 144 |
| SH.SET.MAX.200.750.091 | 200 | 2.400 | 1.930 | 750 | 91 | 112 |
| SH.SET.MAX.200.750.117 | 200 | 2.400 | 1.930 | 750 | 117 | 112 |
| SH.SET.MAX.200.750.181 | 200 | 2.400 | 1.930 | 750 | 181 | 144 |
| SH.SET.MAX.200.750.236 | 200 | 2.400 | 1.930 | 750 | 236 | 144 |

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