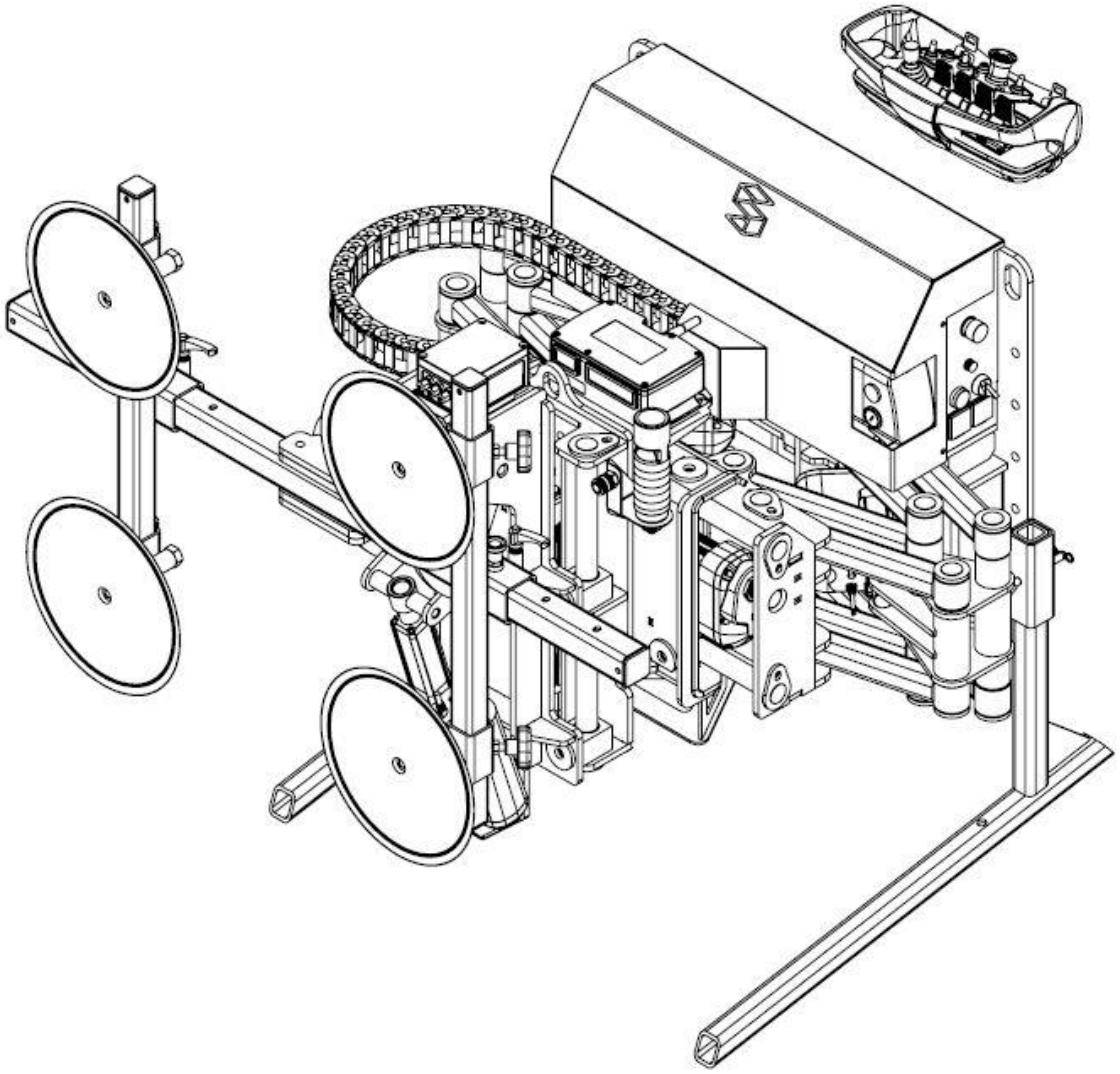
SMARTLIFT



SL 400 RT

User Manual

English

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1 Introduction

Smartlift A/S is an innovative company which develops and manufactures smart lifts, which are marketed worldwide. A Smartlift is characterized by the highest levels of precision, reliability and quality.

The machines are designed to transport and install heavy window sections on construction sites and in industry so that the user does not have to perform heavy and straining manual lifting. The machines are developed with user-friendliness and flexibility in mind, so they are suitable for most tasks.

1.1 Smartlift customer service

Smartlift customer service
tel. +45 97 72 29 11
email: Customerservice@smartlift.com.

1.2 Reading guide

These instructions have been prepared in accordance with DS/EN ISO 20607:2019 Safety of machinery – Operating instructions – General principles for design, and they are the manufacturer's original operating instructions for the machines.

The operating manual provides the user with the information necessary to operate the machine effectively and safely throughout the machine's service life. General safety instructions and conditions are described in a separate section, after which the machine and its intended use are described.

The operating manual is aimed at all users of the machine, and is structured according to the user’s functions and interactions with the machine. Security-related information and instructions appear either as sections or as general information for all users.

When reviewing the operating manual, the following approach is recommended:

- Identify yourself as belonging to one or more user groups before using the machine.
- Read and understand the contents of the operating manual, including information and instructions. If applicable, you only need to read those which are aimed at your particular user type.

In case of uncertainty regarding the above, contact your immediate supervisor.

1.3 About the operation manual

The operating manual has been divided into a user manual and a service manual.

 **User manual Includes:**	 **Service manual Includes:**
Machine overview	Parts lists
Safety instructions	Advanced troubleshooting
Operation of the machine	
Service forms	

The user manual must be stored in a place which is known and accessible to the user and to maintenance personnel.

The service manual must be stored in a place which is known and easily accessible to maintenance personnel.

It is the obligation of the employer (machine owner) to ensure that everyone who services, cleans, operates, maintains or repairs the machine has read the user manual and service manual, or at least the parts of them which are relevant to their work.

Additionally, anyone who operates, services, maintains or repairs the machine is under an obligation to seek information in both the user manual and service manual.

1.3.1 The user

"User" refers to an everyday user who is not a skilled worker in the particular field. The user is assumed to have been instructed in the safety and operation of the machine, and to be able to perform tasks within its field of work. For example, for operation, it is expected that the person is able to start and stop, check the proper centering of the vacuum yoke and remove items during normal operation.
It must be ensured that the person in question has been adequately instructed about the operating instructions and trained so that the work can be performed safely.

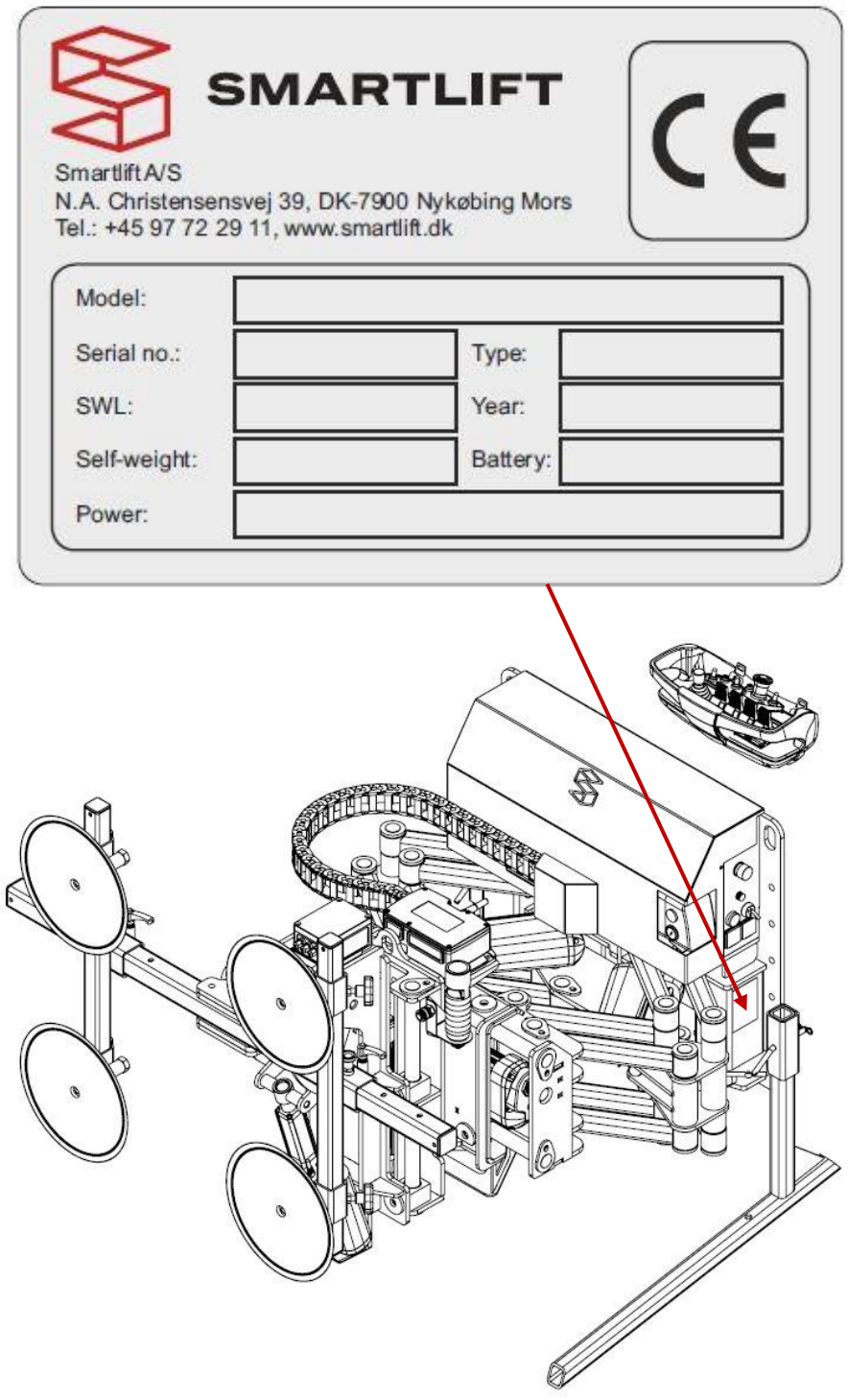
1.3.2 Maintenance personnel

Maintenance personnel must be qualified, either through having trained as e.g. blacksmiths, electricians or mechanics, or by being trained in a way that makes them equal to these professional groups. In addition, they must be familiar with the machine's operation and safety, and know the location of the emergency stop.
Maintenance personnel must have read and understood the user manual, service manual, instructions, workplace instructions, etc.
Before commencing work, repairmen and maintenance personnel must be instructed about the machine’s safety situation.
New maintenance personnel must be trained by an experienced colleague.

1.4 Machine types covered

The user manual covers SL 400 RT. This machine is an equipment for mounting on a parent machine such as a telehandler or similar. The machine is an electric manipulator which is developed for mounting e.g. windows.

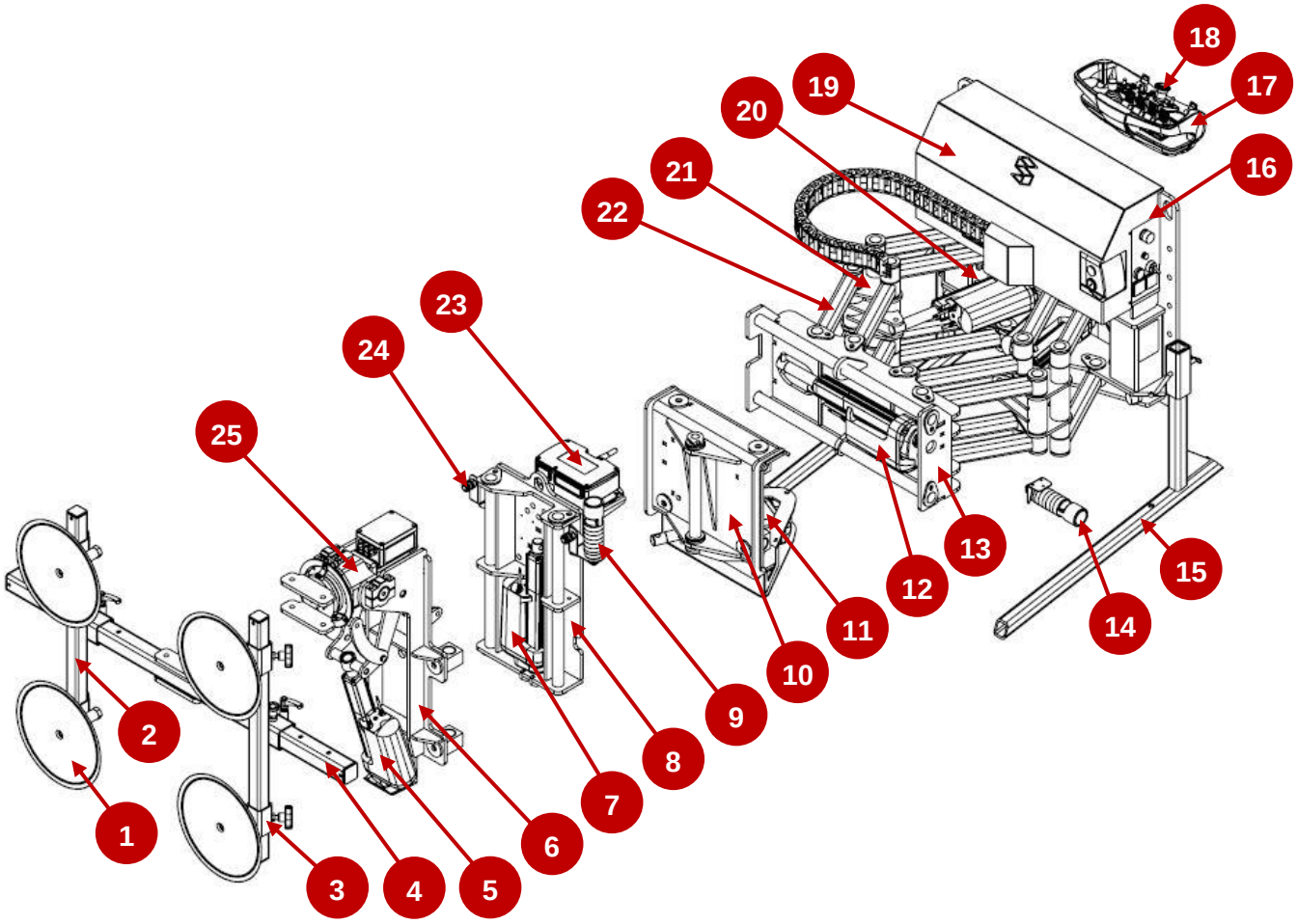
1.5 Nameplate



2 Overview and use

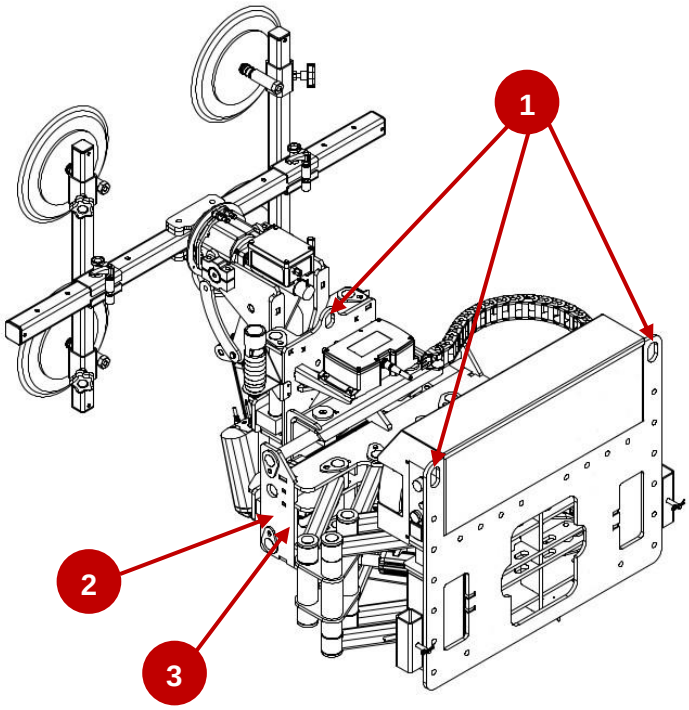
2.1 Machine overview

Below is an overview of the components that are mentioned in several places in this manual and which are often referred to in everyday situations.



No.	Description	No.	Description	No.	Description
1	Suction cup	10	Console for yaw	19	Main unit
2	Crossbar	11	Actuator for yaw	20	Actuator for scissor
3	Suction cup holder	12	Actuator for sideshift	21	Middle joint
4	Yoke	13	Console for sideshift	22	Carrier arm
5	Actuator for tilting	14	2. Alarm - Sound and light	23	Remote control - Receiver
6	Console for tilting / rotation	15	Transport foot	24	Quick coupler
7	Actuator for lifting	16	Emergency stop - Machine	25	Rotator
8	Console for lifting	17	Remote control		
9	1. Alarm - Sound and light	18	Emergency stop - Remote control		

2.2 Label overview



ATTENTION! In case of illegible or unclear information and warnings on labels, load charts, etc., these must be replaced by new ones.

New labels can be ordered from Smartlift's customer service department on tel. +45 97 72 29 11 or via email: Customerservice@smartlift.com.

How to replace labels:

- Remove the old label carefully using a plastic scraper.
- Adhesive residues can be removed using alcohol.
- When the alcohol has evaporated, the new label can be applied.
- Increase durability by removing air bubbles under the label. Air bubbles can be removed by gently pushing them to the edges of the label.

No.	Description	Label
1	Loisting eye	
2	Danger of crushing	
3	Radio waves	

2.3 Technical Specifications

Machine model	SL 400 RT
WLL	400kg 880lb
Self-weight (without transport legs and mounting)	360kg 790lb
Totalweight (WLL + Self-weight)	760kg 1670lb
Height	1,10m 3,60ft
Width	1,25m 4,10ft
Length	1,15m 3,80ft
Suction cups (4 pcs with a diameter of)	300mm 11,80in
Vacuum level	-0,63 bar / -0,72 bar
Operating time, up to	8 hours
Operating battery	24V
Charger for operating battery	230V / 110V
Charging time for operating battery	4 hours
Backupbatteries (2 pcs.)	12V x 2
Charger for backup batteries	230V / 110V
Charging time for backup batteries	4 hours
Remote control batteries (2 pcs.)	7,2V x 2
Charger for remote control batteries	230V / 110V
Charging time for remote control battery	3 hours
Sound level	82 dB (A) 85 dB (C)
Expected service life	10 years

2.4 Operating limits

It is the user's responsibility to be alert and vigilant in the environment in which the machine is used. The user must be aware of everything that could impact safety of both machine and people.

2.4.1 Materials

By default, the machine is equipped with SGF-type suction cups, which are intended for handling flat and smooth objects such as glass, plastic sheets and so on.

WARNING! Never use the machine to lift dirty, dusty, wet or greasy items.

WARNING! Never use the machine to lift items that are not airtight.

2.4.2 Lifting capacity

See the machine's lifting capacity (WLL) in section **2.3 Technical Specifications**.

2.4.3 Wind impact

Wind can have a great impact on both the stability of the parent machine, but also on the machine’s ability to hold especially large loads.

ATTENTION! It is always the user’s responsibility to assess wind strength, wind direction, turbulence and humidity etc. before starting work with the machine.

2.4.4 Temperature and humidity

Permissible temperature range	From -20 C° to 40 C°
Permissible relative humidity (Non-condensing)	From 20 % to 80 %

2.4.5 Lighting

Workspace	Min 200 lux
Repair and maintenance work	Min 500 lux

3 Safety and residual risks

3.1 Safety instructions

The machine may only be used by persons who have received competent training in the use of the machine's functions and who understand the risks involved in using the machine. The user must have read and understood this user manual before using the machine. The user is always responsible for ensuring that the machine is used correctly and safely.
The user must also be possession of the regulatory certificates for the parent machine.



It is forbidden to

- use the machine without it being safely mounted on the parent machine.
- modify the machine.
- lift or transport people.
- be under or in front of the machine when it is loaded.
- be under the machine if it is hoisted.
- exceed the WLL of the machine or any accessories.
- use and charge the machine at the same time.
- løfte under maskinen med gaffeltruck el.lign.
- use the machine without wearing safety shoes.
- use fewer than 4 suction cups.
- use the machine together with a parent machine if its load diagram / load capacity is exceeded.



WARNING! Risk of danger!

- Never use the machine without having read this manual.
- Never use the machine without having read and understood all labels on the machine.
- Never use the machine in case of visible damage or defects.
- Never use the machine without first considering the surroundings and the weather.
- Never use the machine to lift dirty, dusty, greasy or wet items.
- Never use the machine to lift items that are not airtight.
- Never use the machine without exercising great caution.
- Only use the machine in a horizontal position ±10° degrees.
- Improper use of the machine is associated with the risk of parent machine overturning.
- Always stay a sound distance away from the machine and load.



WARNING! Risk of explosion!

- It is forbidden to use the machine in areas where there is a risk of explosion (ATEX zones).

3.2 Emergencies

3.2.1 The machine loses vacuum

WARNING! If the machine suddenly loses vacuum, the load must be immediately lowered and placed on a solid surface!

3.2.2 The machine crashes

WARNING! In case of a crash, the machine must undergo complete servicing!

3.3 Personal protection equipment

This section describes what personal protective equipment may be required when using the machine.

ADVARSEL! Det er forbudt at anvende maskinen uden brug af sikkerhedsfodtøj og sikkerhedshjem!



In addition, the following protective equipment is recommended: Gloves and earmuffs.



4 Operating

This section describes which basic elements it is important to understand in order to maintain a high level of safety when using the machine. This section describes the steps it is necessary to know before, during and after use of the machine.

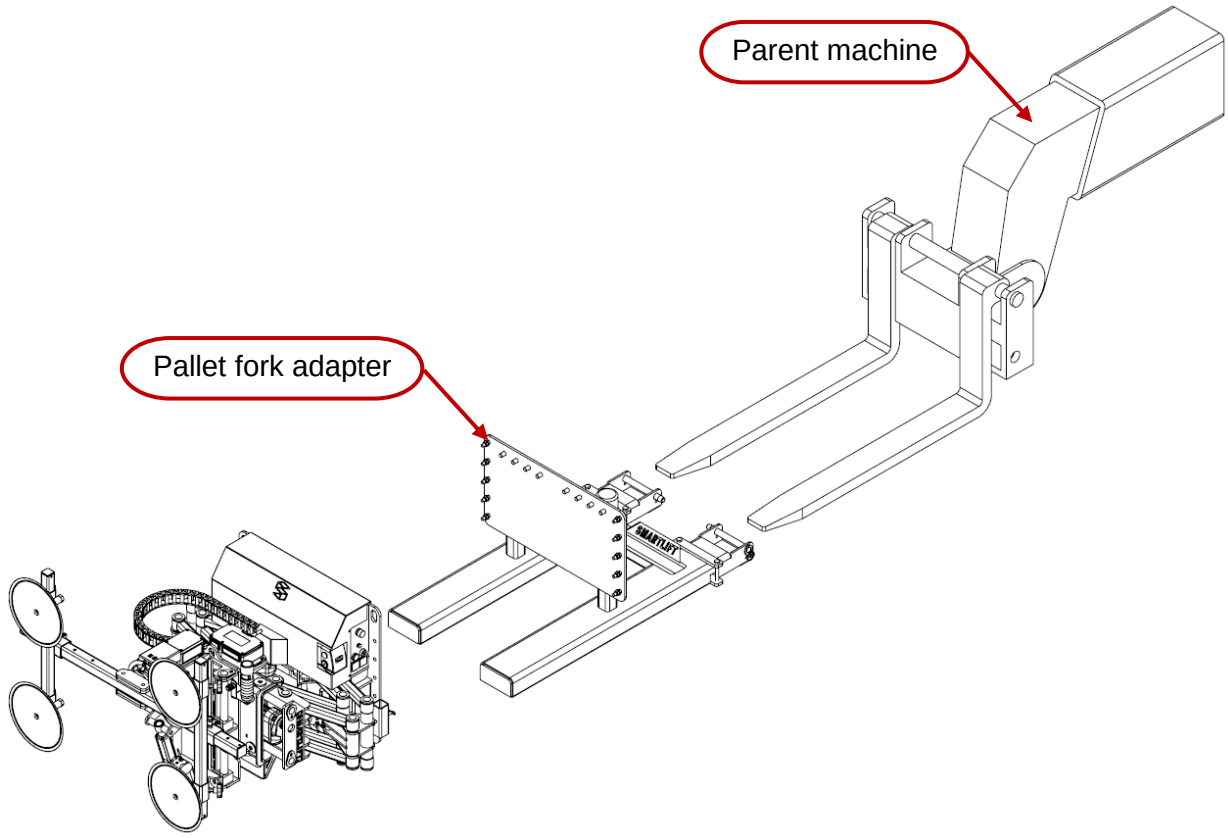
ATTENTION! The user is always responsible for avoiding irresponsible operation of the machine!

4.1 Interconnection

Here it is described how a typical interconnection between the machine and the parent machine works. The machine has a hole pattern on the back which makes it possible to attach different adapters and quick-changes.

4.1.1 Pallet fork adapter

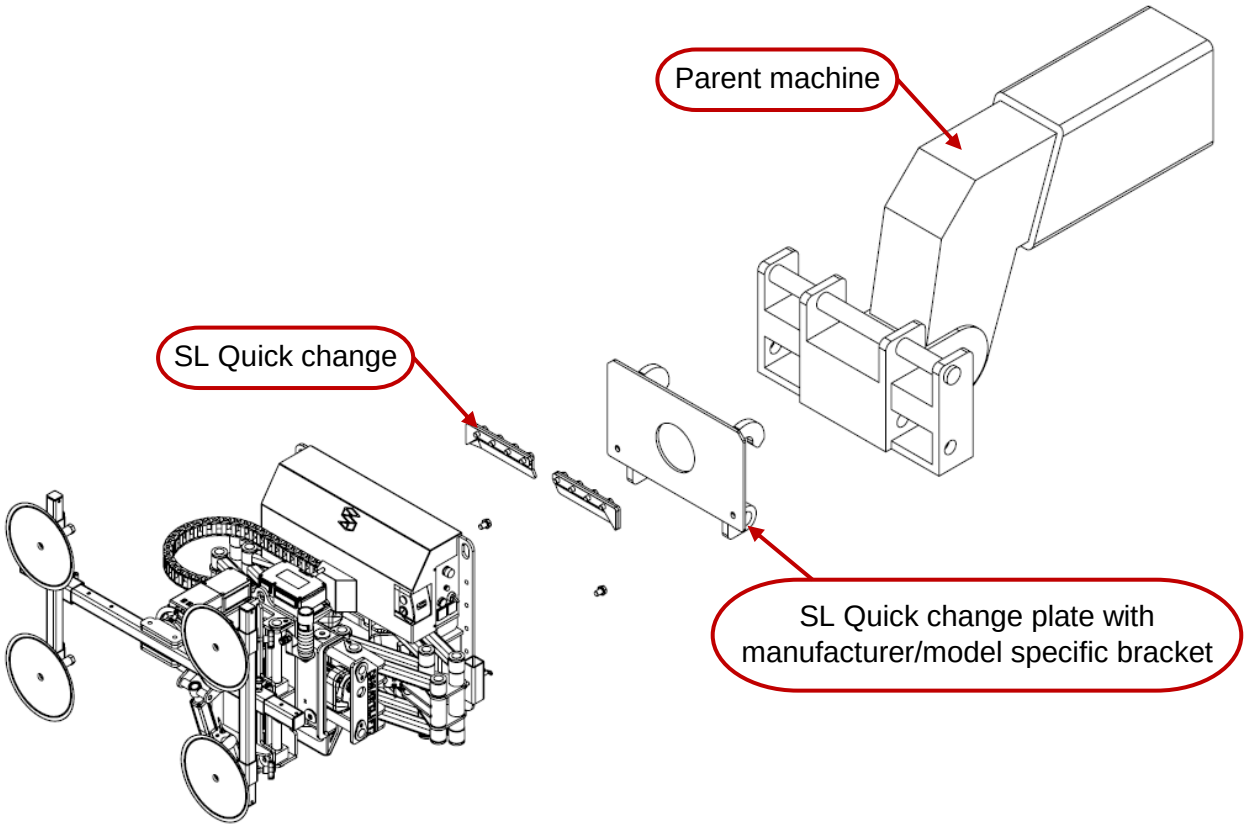
The adapter is bolted to the machine. After this, parent machines with pallet forks can use the machine.



4.1.2 Quick change – SL quick change

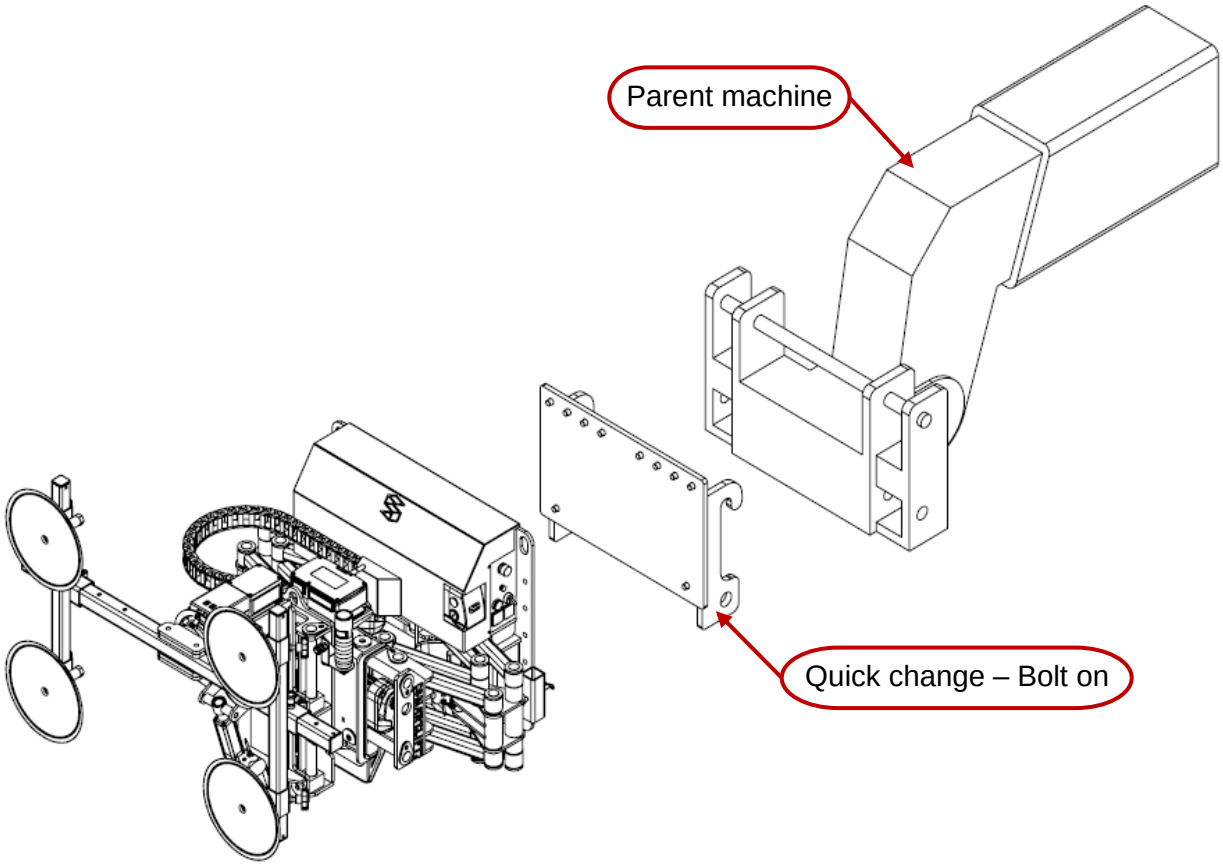
Below is an assembly method where the machine and parent machine are connected together with two quick-changes.

The interconnection consists of Smartlift quick change and SL quick change plate with manufacturer/model specific bracket. This makes it possible to quickly switch between two different manufacturers of parent machines.



4.1.3 Quick change – Bolt on

Quick-change plate with manufacturer/model specific bracket is bolted directly to the machine.



4.2 Before operating

WARNING!

- **Do not use a knife to remove the packaging materials!**
- **Never use the machine if visible damage or defects have been identified!**

Check that the supplied aluminium case contains the following:

- User manual
- Charger for operating battery
- Charger for backup batteries
- Charger for remote control batteries
-
- Remote control
- Batteries for remote control (2 pcs.)
- Connection cable for remote control

Before operating the machine, it must be inspected for visible damage to the i.e. vacuum hoses, wires, suction cups and the vital parts of the steel structure. In addition, the machine must be inspected for any defects. If any damage or defects are identified, these must be repaired before using the machine.

Before operating the machine, the user must always conduct a thorough assessment of the machine's task, including, as a minimum:

- Operating limits (See section **2.4 Operating limits**)
- Battery level (Se section **4.6 Charging batteries**)

4.3 Operating in general

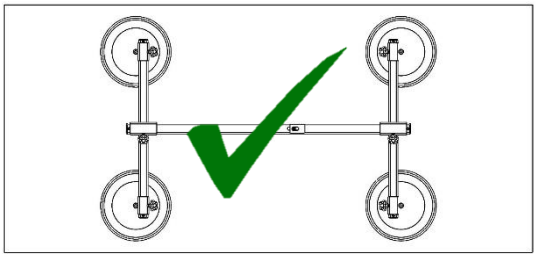
The following describes a typical procedure for using the machine. For a more detailed description of functions, buttons, etc., see section **4.5 Functional overview**.

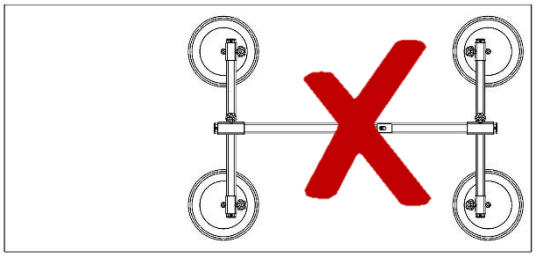
1. Mount the machine on a parent machine.
2. Place the operating battery in the console and lock it using the key.
3. Turn on the operating battery on its ON/OFF-switch.
4. Deactivate the emergency stop on the machine.
5. Turn on the machine on its ON/OFF-switch.
6. Deactivate the emergency stop on the remote control.
7. Turn on the remote control on its ON/OFF-switch.
8. Check that the moving functions of the machine correspond to the position of the user in relation to the machine.
9. Use the parent machine to place the machine close to the object.
10. Centre the machine in front of the object.
11. Adjust the suction cups to fit the object.
    ATTENTION! The distance between the suction cups must be as great as possible!
12. Push the suction cups against the object using the extension function.
    WARNING! Never lift damp or greasy objects!
13. Activate vacuum.
    ATTENTION! The alarm signal sounds until sufficient vacuum has been achieved!
    ATTENTION! The alarm lights must illuminate green in order before sufficient vacuum has been achieved.
14. Transport the object to the mounting location using the parent machine.
15. Place the object in the desired position using the machine functions and fasten the object.
16. Deactivate vacuum.
    ATTENTION! Wait for the machine's suction cups to release the object!
17. When handling several objects, repeat step 9 through 16.
18. Turn of the remote control by holding down its ON/OFF-switch.
19. Turn off the machine on its ON/OFF-switch.
20. Turn off the operating battery on its ON/OFF-switch.
21. Charge batteries as described in section **4.6 Charging batteries**.

4.4 Risks when operating functions

This section visualizes where hazardous situations may occur when using the machine functions.

- **ATTENTION! Before using any moving functions note the following:**
  - The yoke and the load can hit the machine.
- **ATTENTION! Before suction is applied to the load:**
  - The star knobs on suction cup holders and crossbars must be tightened.
  - Position bolts on crossbars must be engaged.
  - The vacuum yoke must be centred relative to the load's centre of gravity.





WARNING! If the yoke is not centred relative to the load's centre of gravity there is a risk that the load will be pulled off the suction cups and that the parent machine will tip over.

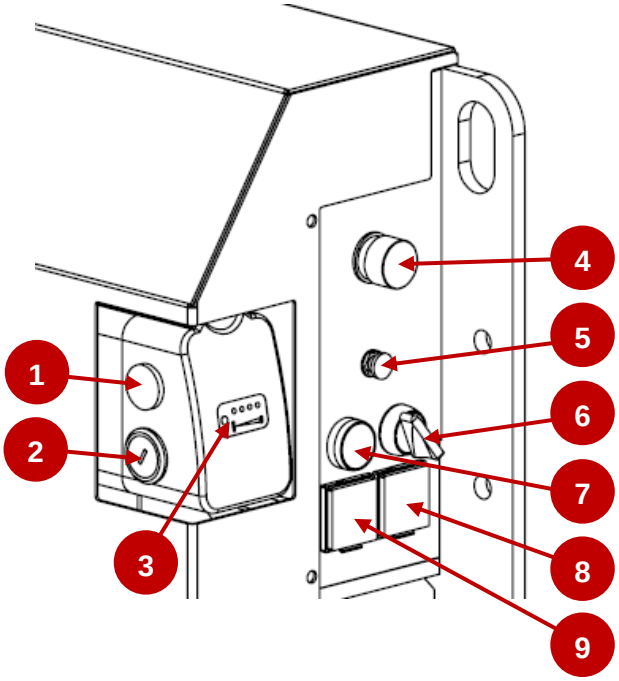
- **ATTENTION! Before the load is lifted:**
  - The machine must be in a horizontal position ±10°.
  - The machine’s alarm light must illuminate green (Sufficient vacuum obtained).

- **ATTENTION! Before the vacuum yoke is rotated:**
  - The yoke and the load can hit the machine.
  - Vacuum hoses can become pinched or stretched.

4.5 Functional overview

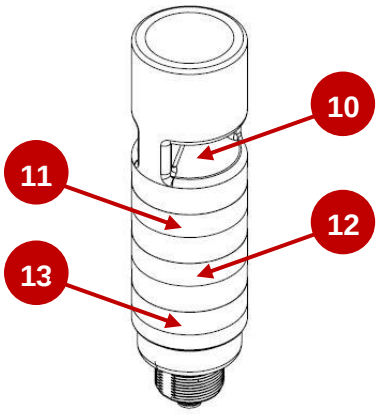
4.5.1 Machine

No.	Description	Function
1	Charging socket - Operating battery	Connecting socket for external charging.
2	ON/OFF - Operating battery	Disconnects power directly on the battery.
3	Battery indicator - Operating battery	Indicate the battery level.
4	Emergency stop - Maschine	Disconnects all moving parts of the machine. Vacuum is not disconnected.
5	Charging socket - Backup batteries	Connecting socket for external charging.
6	ON/OFF - Machine	Disconnects power to the control box.
7	Reset	Disable alarm sound for ongoing alarm. **WARNING! May only be used in connection with repairs!**
8	Digital vacuum meter - Red circuit	Monitors the vacuum level in the red vacuum circuit.
9	Digital vacuum meter - Blue circuit	Monitors the vacuum level in the blu vacuum circuit.

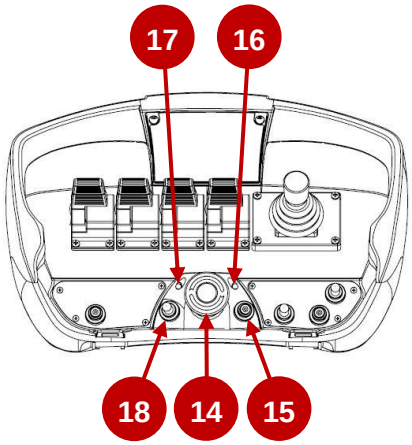


4.5.2 Alarm – Sound and light

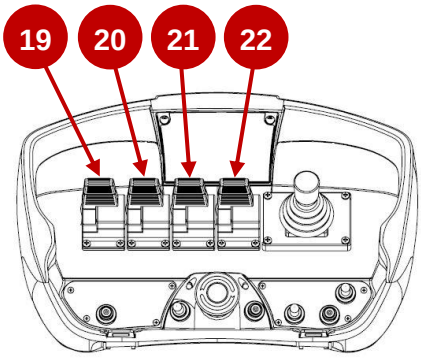
No.	Description	Function
10	Alarm – Sound	WARNING! Unload the machine immediately. • Vacuum leve is critical. • Battery level is critical. ○ Backup batteries are activated. ○ The speed is reduced.
11	Alarm - Light - RED	WARNING! Unload the machine immediately. • Vacuum leve is critical. • Battery level is critical. ○ Backup batteries are activated. ○ The speed is reduced.
12	Alarm - Light - YELLOW	ATTENTION! Vacuumlevel is low. • Vacuum is being rebuilding.
13	Alarm – Light - GREEN	The machine is ready for use.



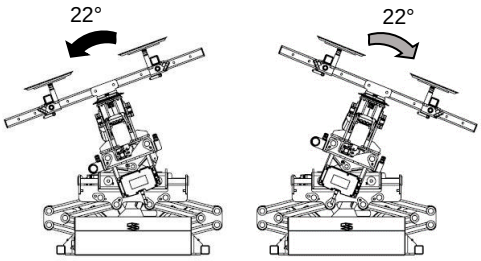
4.5.3 Remote control



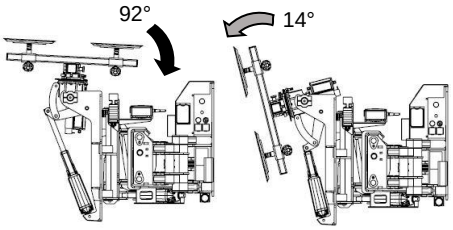
No.	Description	Function
14	Emergency stopp	Disables all functions except vacuum.
15	ON/OFF + Reset	Turns the remote control ON/OFF. The remote control is reset by holding down the switch for approx. 5 sec.
16	LED	Light up red if the remote control is on.
17	LED	GREEN - Remote control is connected to the machine Red - Remote control is not connected to the machine
18	Speed regulator	Limits the speed of the moving functions in 3 speed levels. 1. press to the left: Level 1 - LED (No. 16) 1 green flash 2. press to the left: Level 2 - LED (No. 16) 2 green flashes 3. press to the left: Level 3 - LED (No. 16) 3 green flashes 1. press to the right: Reset speed levels.



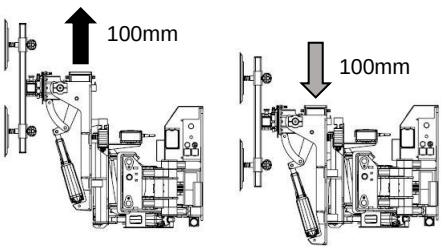
No.	Description	Function
19	Yaw	Forward: The vacuum yoke yaw to the right. Backward: The vacuum yoke yaw to the left.



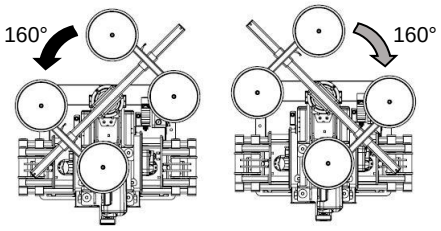
No.	Description	Function
20	Tilt	Forward: The vacuum yoke is tilted forward. Backward: The vacuum yoke is tilted backwards.

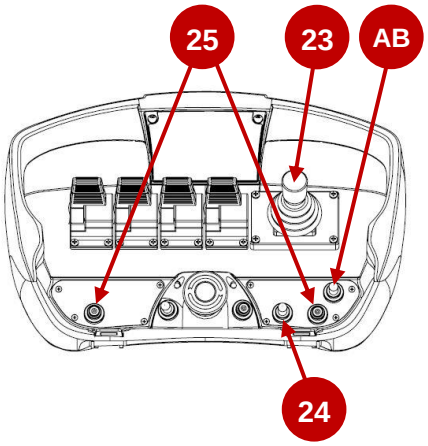


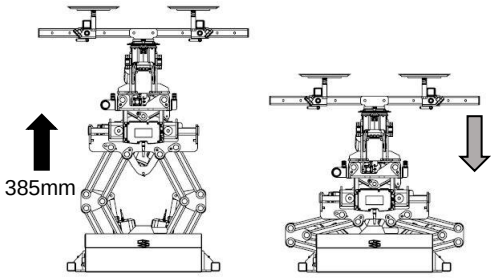
No.	Description	Function
21	Raise / lower	Forward: The vacuum yoke is lowered. Backward: The vacuum yoke is raised.

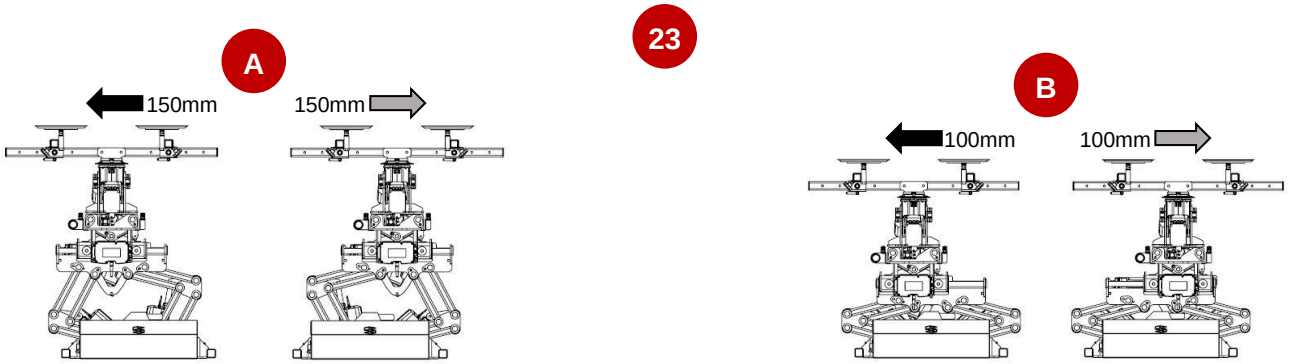


No.	Description	Function
22	Rotation	Forward: The vacuum yoke is rotated clockwise. Backward: The vacuum yoke is rotated counterclockwise.









No.	Description	Function
23	Joystik	Forward: The vacuum yoke is exstended. Backward: The vacuum yoke is retracted. Right: The vacuum yoke is moved to the right. Left: The vacuum yoke is moved to the left.
A	Side shift	Left: The vacuum yoke is moved sideways with the scissor.
B	Side shift	Right: The vacuum yoke is moved parallel sideways.
24	Mirroring functions	Forward: All functions are based on the user being located behind the machine Backward: All functions are based on the user being located in front of the machine.
25	Vacuum	Aktivate: Press one of the two buttons. Deactivate: Press both buttons simultaneously and hold for approx. 3 sec.

4.6 Charging batteries

This section describes the charging patterns of the machine's various batteries. In order to ensure optimum preservation of battery capacity, use the following charging pattern.

ATTENTION!

- **Charging must take place somewhere with good ventilation!**
- **Charging can never take place in a location where there are sparks, flames or smoking!**
- **If the charger is connected for a period of time which is shorter than recommended, over time, the battery capacity will be reduced permanently!**

4.6.1 Operating battery and backups batteries

Charging and maintenance procedure:

1. Turn of the machine on its ON/OFF switch.
2. Turn of the operating battery on its ON/OFF switch.
3. Connect the external charger to the charging socket on the operating battery.
4. Connect the external charger to the charging socket for the backup batteries. See locations of switches and charging sockets in section **4.5.1 Machine**.
5. Charge the batteries for at least 4 consecutive hours before using the machine.

WARNING!

- **Using and charging the machine at the same time is forbidden. This will damage the charger and batteries!**
- **Both Operation battery and backup batteries must be charged before any use of the machine!**

ATTENTION!

- **The operating battery should only be charged until it is fully charged. Continuously charging will permanently reduce the capacity of the operating battery.**
- **The backup batteries should continue to be charge after they are fully charged. Continuously charging maintains the capacity of the backup batteries.**

Charger - Operating battery 230V / 110V	
LED	**Description**
1 LED illuminates RED	Connected
2 LEDs illuminates RED	Charging
1 LED illuminates RED 1 LED illuminates GREEN	Fully charged / Storage-mode

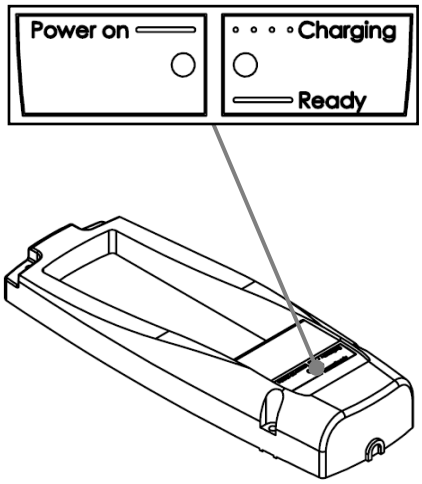
Charger - Backup batteries 230V / 110V	
LED	**Description**
LED illuminates YELLOW	Charging
LED illuminates GREEN	Fully charged / Storage-mode

4.6.2 Remote control batteries

Charging and maintenance procedure:

1. Place a battery in the external charger.
2. Charge the battery for at least 3 consecutive hours before using the battery.
3. Replace the batteries if necessary and at the end of the day.
4. Always have the extra battery charging.

Charger - Remote control 230V / 110V	
LED	**Decription**
Power LED: Illuminates RED	The charger is connected
Charging LED: Flashing GREEN	Charging battery
Charging LED: Illuminates GREEN	Fully charged / Storage-mode



5 Storage, transport, handling and lifting

5.1 Storage

If the machine needs to be stored, storage must be done under the following conditions in order to preserve the machine's condition and functional capacity:

- Indoor
- Dry
- With good ventilation

ATTENTION!

- **Water, moisture and dust can affect the machine's functionality and reduce the service life of suction cups and the vacuum system!**
- **Drought, sunlight and temperatures below 0°C (32°F) or above 25°C (77°F) may reduce the service life of the suction cups and the batteries!**

How to store:

- Turn off the remote control by holding down the ON/OFF switch.
- Turn off the machine at its ON/OFF switch.
- Turn off the operating battery at its ON/OFF switch.
- For charging of batteries during storage see section **4.6 Charging batteries.**

5.2 Transport

When transporting the machine, it is recommended that a van, machine trailer, flatbed truck or similar with sufficient load capacity is used. Find the weight of the machine in section **2.3 Technical Specifications**.

A procedure for secure fastening of the machine: See section **2.2 Label overview**.

- Turn off the remote control by holding down the ON/OFF switch.
- Turn off the machine at its ON/OFF switch.
- Turn off the operating battery at its ON/OFF switch.
- Strap the machine in place using the 3 lashing eyes.
- Protect the machine's suction cups from rain, moisture and dust. Protective caps can be purchased in addition.

5.3 Handling and lifting

When handling and lifting the machine, use approved lifting equipment in the form of a crane or hoist with sufficient load capacity. In addition, approved lifting equipment must be used in the form of round slings, chains etc. with sufficient load capacity. Find the weight of the machine in section **2.3 Technical Specifications**. See location of lifting and lashing eyes in section **2.2 Label overview**.

Procedure for handling and lifting the machine:

- Turn off the remote control by holding down the ON/OFF switch.
- Turn off the machine at its ON/OFF switch.
- Turn off the operating battery at its ON/OFF switch.
- Lift the machine in the designated hoisting eyes.
- Mount transport legs.
- Place the machine on a firm and level surface

6 Maintenance and troubleshooting

6.1 Overview of service, maintenance and lubrication intervals

No.	Annually ⇩	Monthly interval ⇩	Daily	In addition to the dates listed, some components are subjected to ongoing wear and must therefore be replaced if necessary.	
1.0				**Machine log and labelling**	
1.1	X	12	X	The user manual is accessible and easy to understand.	Receipt of new user manual. State machine type and serial number when ordering.
1.2	X	12		Labels on the machine. Check that all labels are visible and intact.	Defective labels must be replaced if necessary. Load chart, WLL, attention/warning stickers.
2.0				**Battery and charger**	
2.1	X	12		Operating battery.	Replace the batteries if the voltmeter reads less than 24 volts when the batteries are fully charged.
2.2	X	12		Charger for operating battery.	Check the charging function: output must be 24 volts when charging.
2.3	X	12		Backup batteries.	Replace the batteries if the voltmeter reads less than 24 volts when the batteries are fully charged.

2.4	X	12		Charger for backup batteries.	Check the charging function: output must be 24 volts when charging.
2.5	X	12		Remote control batteries.	Replace the batteries if the voltmeter reads less than 7 volts when the batteries are fully charged.
2.6	X	12		Charger for remote control batteries.	Check the charging function: output must be 12 volts when charging.
3.0				**Vacuum System**	
3.1	X	12	X	Vacuum pumps	See vacuum level section **2.3 Technical Specifications**. If the pressure drops, check and remedy. Replace defective pumps.
3.2	X	12	X	Vacuum valves	Check the opening and closing function for the slider valves by using the remote control.
3.3	X	12		Vacuum filters	Remove and clean. Replace if necessary.
3.4	X	3		Vacuum system test	Check vacuum on a *test plate. Switch off the main switch and controller if the test plate remains stuck for a minimum of 10 min. If the test plate falls off, find the problem and remedy it.
3.5	X	12		Test vacuum sequences	The pumps start. See vacuum level in section **2.3 Technical Specifications**. The pumps stop. See vacuum level in section **2.3 Technical Specifications**. Check that the alarm sound and light work as described in section **4.5.2 Alarm – Sound and light**.
3.6	X	12	X	Vacuum hoses	Check and replace if damaged.
3.7	X	12	X	Suction cups	Check for damage and replace if necessary.
3.8	X	12		Couplings	Clean and lubricate (A). Check for leaks. Tighten if necessary and replace if damaged.
4.0				**Actuators**	
4.1	X	12		Check for suspicious sounds and full movement in all directions; lifting, extension, side shift, tilt and rotation.	Defective actuators must be replaced.
4.2	X	12		Cables, cable routes, connectors and connections.	Check all cables for breakage and fastening. Check all connectors and connections for poor connection and proper attachment.
5.0				**Mechanical equipment**	
5.1	X	12		The entire machine	Visual inspection. Welds, damage or excessive wear on parts must be repaired or replaced.
5.2	X	12		Yoke	Visual inspection. Welds, damage or excessive wear on parts must be repaired or replaced. Lubricate moving parts. (B)
5.3	X	12		Bearings and shafts	All moving parts must be checked for wear and clearance. Defective bearings must be replaced. Lubricate all shafts and grease nipples. (B)
5.4	X	6		Bolt and screws	After approx. 50 hours of use, all bolts and screws should be checked and retightened if necessary. Make sure the bolts and screws are secured with Loctite.

					Bolts on the actuators cannot be retightened.
5.5	X	12	5	Main yoke	Visual inspection. Welds, damage or excessive wear on parts must be repaired or replaced. Lubricate moving parts. (B)
5.6	X	12	5	Crossbars	Visual inspection. Welds, damage or excessive wear on parts must be repaired or replaced. Lubricate moving parts. (B)
5.7	X	12	5	Suction cup holder	Visual inspection. Welds, damage or excessive wear on parts must be repaired or replaced. Lubricate moving parts. (B)
6.0				**Electronics and safety equipment**	
6.1	X	1		Operating battery ON/OFF switch	Check ON/OFF function.
6.2	X	1		Machine ON/OFF switch	Check ON/OFF function.
6.3	X	1		Machine Emergency stop	Check function Replace if necessary.
6.4	X	12		Remote control • ON/OFF switch • Emergency stop • Linear levers and joy stick	Check all functions. Remedy if this does not work or is damaged, and repair or replace if necessary.
7.0				**External and additional equipment**	
7.1	X	12		Communication cable for remote control	Visual inspection. Make sure that the part is present, intact and functional.
7.2	X	12		Shoulder strap for remote control	Visual inspection. Make sure that the part is present, intact and functional.
7.3	X	12		Transport legs (2 pcs)	Visual inspection. Welds, damage or excessive wear on parts must be repaired or replaced.
8.0				**Static load test**	
8.1	X	12		Test with a load corresponding to WLL+ 25%	Perform a load test in all possible positions.

The test plate is a plate which is big enough to allow all suction cups to be on the plate at the same time (approx. 1,5x1,5m). The plate must be airtight and can be made of plastic, steel, etc.

Lubrication schedule:

A = Silicone grease, Kema SC4 or equivalent

B = Calcium sulfonate grease

Bearings are made with Teflon surfaces or oil-rubbed bronze. Lubrication is intended for smaller moving parts.

6.2 Functional inspection

6.2.1 Vacuum system

Procedure for inspecting the vacuum system for leakages, referred to as a leakage inspection in this document.

ATTENTION!

- **Suction cups should be inspected daily**!
- **Vacuum hoses should be inspected monthly or quarterly, or as needed**!

- **Leakage inspection of the vacuum system must be done according to section 6.1 Overview of service, maintenance and lubrication intervals.**

1. Turn on the operating battery on its ON/OFF switch.
2. Turn on the machine on its ON/OFF switch.
3. Turn on the remote control on its ON/OFF switch.
4. Check all battery levels.
5. Adjust the suction cups to fit the test plate.
   WARNING! Never use a dirty, dusty, greasy or wet object!
   WARNING! Never use an object that is not airtight!
   WARNING! There is a risk that the machine will release the object in connection with the leakage inspection!
   ATTENTION! The object must be an airtight sheet, e.g. one of plastic, steel, glass or the like!
6. Push the suction cups against the object using the joystick.
7. Activate vacuum.
8. Monitor the machine's vacuum pumps for at least 10 minutes.
   WARNING! If the red or yellow alarm light comes on within 10 minutes, do not use the machine! See section **4.5.2 Alarm – Sound and light** and section **6.4 Troubleshooting.**
9. Deactivate vacuum.
   ATTENTION! Wait for the machine's suction cups to release the object!
10. Turn off the remote control by pushing and holding the ON/OFF switch.
11. Turn off the machine on its ON/OFF switch
12. Turn off the operating battery on its ON/OFF switch.

6.2.2 Safety functions

Procedure for inspecting safety functions.

ATTENTION!

- **Safety features must be inspected according to section 6.1 Overview of service, maintenance and lubrication intervals!**
- **Safety features must always be available and functional!**
- **If an inspection of the security features cannot be completed and approved, the machine cannot be used until repairs have been completed and a new inspection has been carried out!**
- **Always inspect security features in an open space where there are no obstacles!**

- **Emergency stop - Machine and remote control**
  - Activate the emergency stop by pushing the mushroom emergency stop button manually.
  - Checks: All moving functions should now be inoperational. Vacuum functions are not affected by emergency stop.
  - Deactivate the emergency stop by rotating the button.
  - Checks: All moving functions should be operational again.

6.3 Cleaning the machine

- Clean the machine with running water, soap and a soft brush.
  ATTENTION! Do not use a pressure washer to clean the machine.
- Clean the suction cups with ethanol.
- Alternatively, the suction cups can be cleaned with hot water, soap and a soft brush.
  - Always rinse with clean water.
  - Let the suction cups dry at room temperature.

  ATTENTION!
  - **Never direct the jet of water at the suction cups!**

- **Always make sure that water does not enter the vacuum system.**

ATTENTION! Never use the following products to clean the suction cups:

- **Pure glycerine.**
- **The solvents trichlorethylene, carbon tetrachloride or hydrocarbons.**
- **Vinegar-based cleaners.**
- **Sharp objects, metal brushes, sand paper etc.**

6.4 Troubleshooting

ATTENTION! In case of unexpected failure or malfunctioning of the machine, the machine must be stopped immediately, and the fault must be reported to Smartlift customer service immediately via tel. +45 97 72 29 11 or via email customerservice@smartlift.com.

No.	Problem	Cause	Solution
1.	No response to: • Scissor • Sideshift • Yaw • Lifting • Tilting • Rotation	• Fuse is blown • Remote control is not connected (Red led on the left side of the emergency stop lights up)	• Check fuses • Hold down the remote control ON/OFF switch for 5 seconds to reset and reconnect the remote control
2.	• Vacuum pump runs frequently or continuously	• Leak in the vacuum system. • ATTENTION! The vacuum level must be maintained for at least 10 minutes without the pumps running!	• Unload the machine immediately • Check that the suction cups seal tightly against the object • Check the vacuum hoses and suction cups for damage • Check that the slide valve has been closed ATTENTION! The vacuum must start and stop again!

6.5 Fuses

Size	Function	Position
20A	Operation battery	Inside the battery
15A	Charger	In the control box
6A	Emergensy stop	In the control box

6.6 Spare parts

If spare parts are needed, these can be ordered by contacting your nearest dealer or Smartlift Customer Service at tel. +45 97 72 29 11 or email: customerservice@smartlift.com.

7 Scrapping and disposal

The machine must be scrapped and disposed of in accordance with local regulations.

8 Annexes

8.1 Terms and abbreviations

Term	Text
Warning!	Things that can cause bodily injury or death.
Attention!	Things that can cause bodily injury or property damage.
The user	The person who operates the machine and is responsible for security.
Parent machine	The machine on which the SL 400 RT is mounted.
The machine	SL 400 RT.
Vacuum yoke	A collective term for yoke, crossbars and suction cups.
The load	The object to be lifted.
Wind load	Effect of wind on the load and machine.

Abbreviation	Meaning
SL	Smartlift
RT	Rotation
WLL	Working Load limit / Safe lifting capacity

8.2 Declaration of conformity

Manufacturer and bearer of responsibility for the compilation of technical files:

Smartlift A/S
N.A. Christensensvej 39
DK - 7900 Nykøbing Mors

Hereby declares that:

Model:

☐ SL 400 RT

Serie no.: _____

Date: _____ - _____ - 20_____

has been manufactured in accordance with the following EC directives:

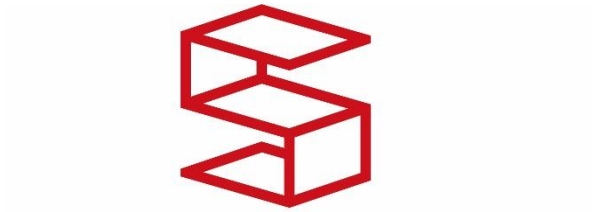
The Machinery Directive 2006/42EC

The EMC Directive 2014/30/EU

Date: _____ **Signature:** _____

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