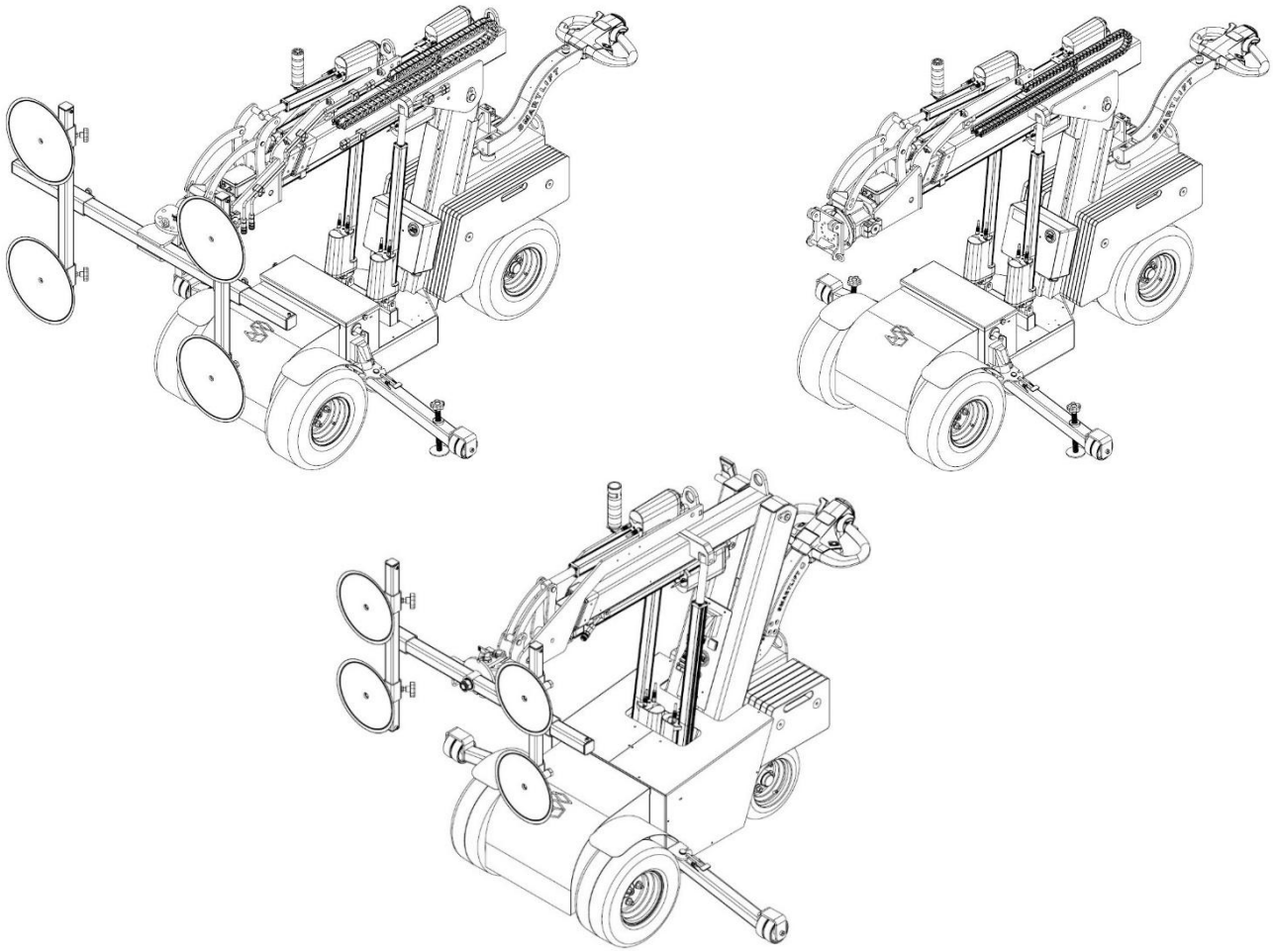
SMARTLIFT



SL 309	SL 409	SL 609 HL	SLI 409	SLI 609 HLE
SL 309 RT	SL 409 HL	SL 609 HLE	SLI 409 HLE	
	SL 409 HLE	SL 609 HLE RT		
	SL 409 HLE RT			

User Manual

English

Issued by:	Date:	Approved by:	Document name.:
MR	04-07-2025	TST	USER MANUAL - 309-409-609 EN 02

Table of contents

1 Introduction

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

The **SL machines** are designed for transport and installation of heavy window elements on construction sites and in industry, without exposing the user to heavy gruelling lifting. The machines have been developed with a focus on user-friendliness and flexibility, and can thereby solve most tasks.

The **SLI machines** are based on the basic structure of a similar SL machine, but are built without the vacuum system in favour of specially adapted solutions.

A Smartlift is a utility tool, designed for lifting glass with a controlled and fixed vacuum yoke. The machine's application possibilities can be increased by purchasing accessories like lifting hook and pallet forks, but the machine must not be compared to a crane or a forklift. The machine is not designed to comply with any crane and truck regulations.

1.1 Smartlift customer service

Smartlift customer service
Tel. +45 97 72 29 11
E-mail: 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.

Headings followed by (**SL**) only apply to machines with vacuum. The manual mainly contains illustrations of SL machines.

1.3 About the manual

The 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 centring 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.

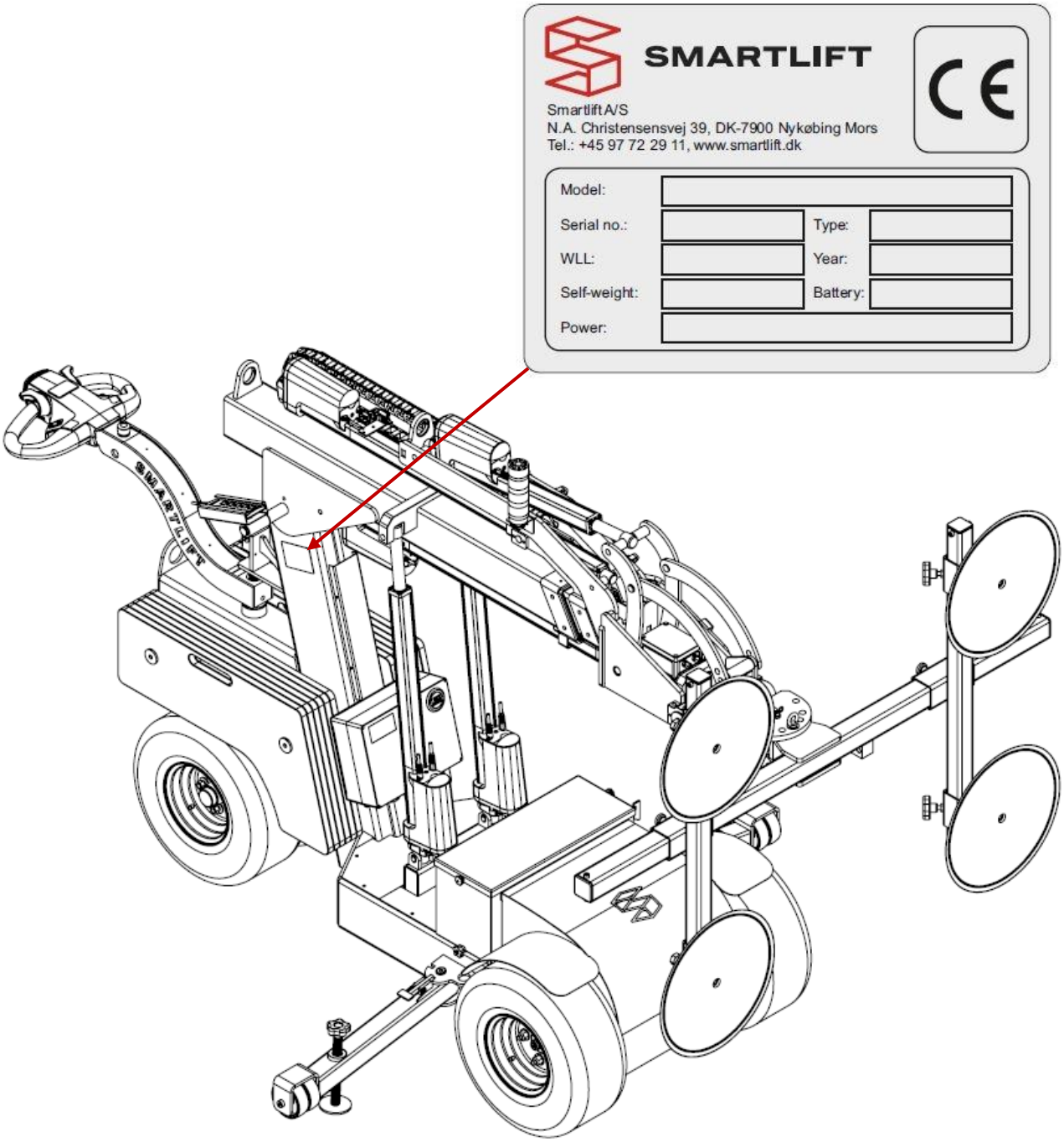
1.4 Machine types covered

The user manual covers machines SL 309, SL 409, SL 609, SLI 409 and SLI 609. The SL series is part of the Smartlifts Outdoor series, which has been developed to handle work tasks on construction sites, outdoors as well as indoors. SLI is based on the SL series, but is suitable for tasks where lifting with a vacuum cannot be used, but instead uses a special tool. The user manual also covers the equipment models below:

Model - SL	**Description**	**Equipment**			
		1. Extension - Electrical	2. Extension - Manually	2. Extension - Electrical	Electrical rotation
SL 309 SL 409	Base machine	**X**			
SL 409 HL SL 609 HL	Highlifter	**X**	**X**		
SL 409 HLE SL 609 HLE	Highlifter Electric	**X**		**X**	
SL 409 HLE RT SL 609 HLE RT	Highlifter Electric Rotation	**X**		**X**	**X**
SL 309 RT	Rotation	**X**			**X**

Model - SLI	**Description**	**Equipment**			
		1. Extension - Electrical	2. Extension - Manually	2. Extension - Electrical	Electrical rotation
SLI 409	Base machine	**X**			
SLI 409 HLE SLI 609 HLE	Highlifter Electric	**X**		**X**	

1.5 Nameplate



2 Safety and residual risks

2.1 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.
When using special equipment (forks, lifting hooks, etc.), the user must have read and understood the user manual for this equipment, and must hold the relevant certificates required by law.

It is forbidden to:

- Modify the machine!
- Lift or transport people!
- Stay under or in front of the machine when it is loaded!
- Stay under the machine if it is hoisted!
- Sit or stand on the machine!
- Exceed the WLL of the machine or any accessories!
- Exceed the load chart of the machine! See section **10.3 Load charts SL** / **10.4 Load charts SLI**.
- Lift underneath the machine using a forklift or the like!
- Use the machine without wearing safety shoes!
- Use fewer than 4 suction cups when using the vacuum yoke (SL)!
- Use a high-pressure washer to clean the machine!

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, the surface and the weather!
- Never use the machine on dirty, dusty, wet or greasy objects!
- Never use the machine to lift objects that cannot be closed airtight with the suction cups!
- Never use the machine without exercising great caution!
- Using the machine involves a risk of overturning!
- Always drive down slopes at low speed (turtle) and with great caution!
- Never leave the machine loaded or on a slope!
- Always stay a sound distance away from the machine and load!
- When using the machine, the user must have full overview of the machine to ensure that no one else is nearby!
- If the machine suddenly loses vacuum, the load must be immediately lowered and placed on a solid surface!

WARNING! Risk of explosion!

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

2.2 Emergencies

⚠ **WARNING! In the event of an overload or breakdown, complete service of the machine must be performed!**

2.2.1 The machine loses vacuum (SL)

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

2.2.2 The machine overturns

If the machine has overturned, it must be raised by hoisting from the designated hoisting eyes. See section **5.3 Handling and lifting**.

⚠ **WARNING!**

- **The machine's batteries contain acid!**
- **If the machine tips over, there is a risk that battery acid will leak out!**
- **If skin or eyes come into contact with battery acid, rinse them with plenty of clean water and consult a doctor!**

2.2.3 Fire

In the event of a fire in the machine, use a CO2 extinguisher.

2.3 Personal protection equipment

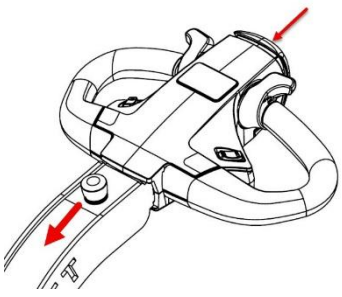
This section describes what personal protective equipment may be required when using the machine.

⚠ **WARNING! It is forbidden to use the machine without wearing safety footwear!**

In addition, the following protective equipment is recommended: Safety helmet

2.4 Safety switch - Belly button

If the machine is driven backwards and the belly button switch is triggered, the machine will automatically change the direction of travel for a short while. This reduces the risk of getting caught between objects and the machine.

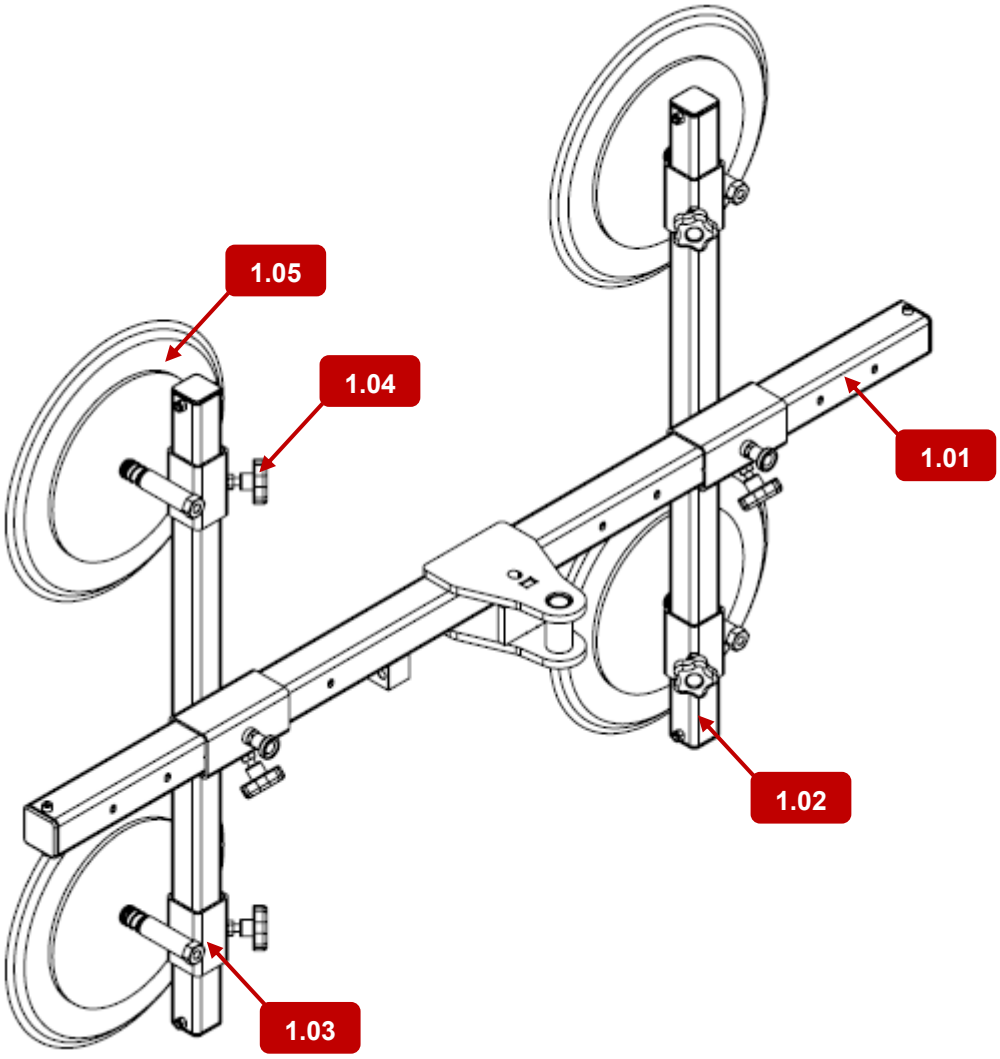


3 Overview and use

3.1 Machine overview

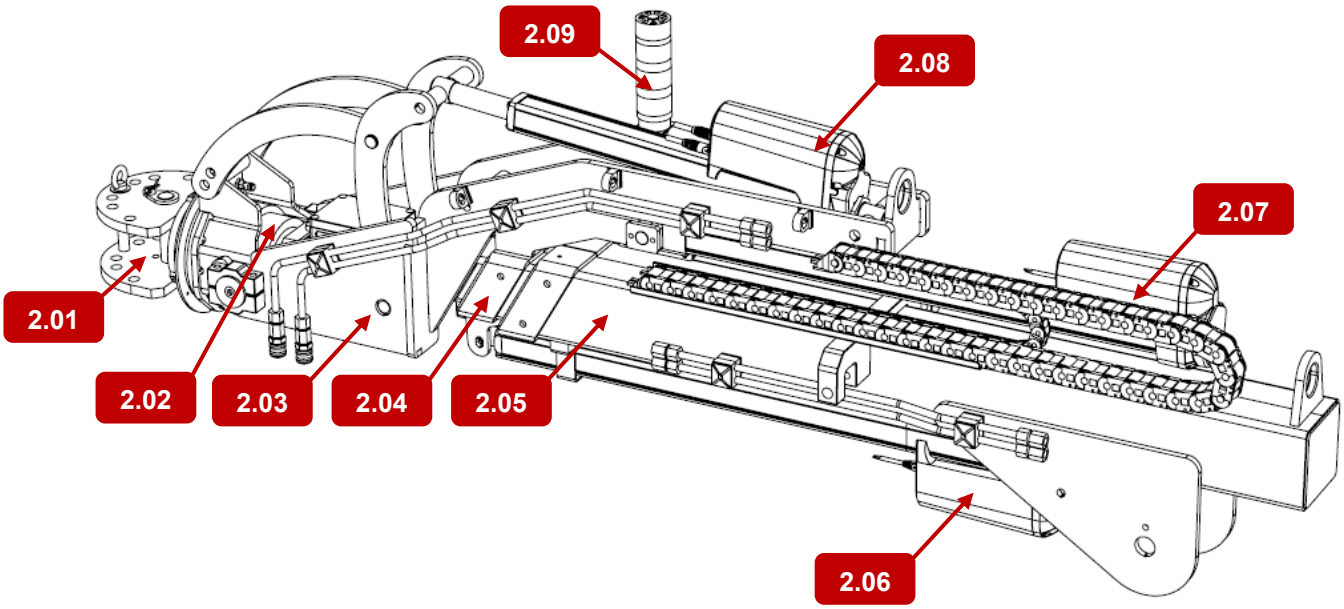
Here are overviews of the components that are mentioned in several places in this manual and are most often referred to in everyday situations. The illustration below shows the SL 609 HLE RT.

3.1.1 Vacuum yoke (SL)



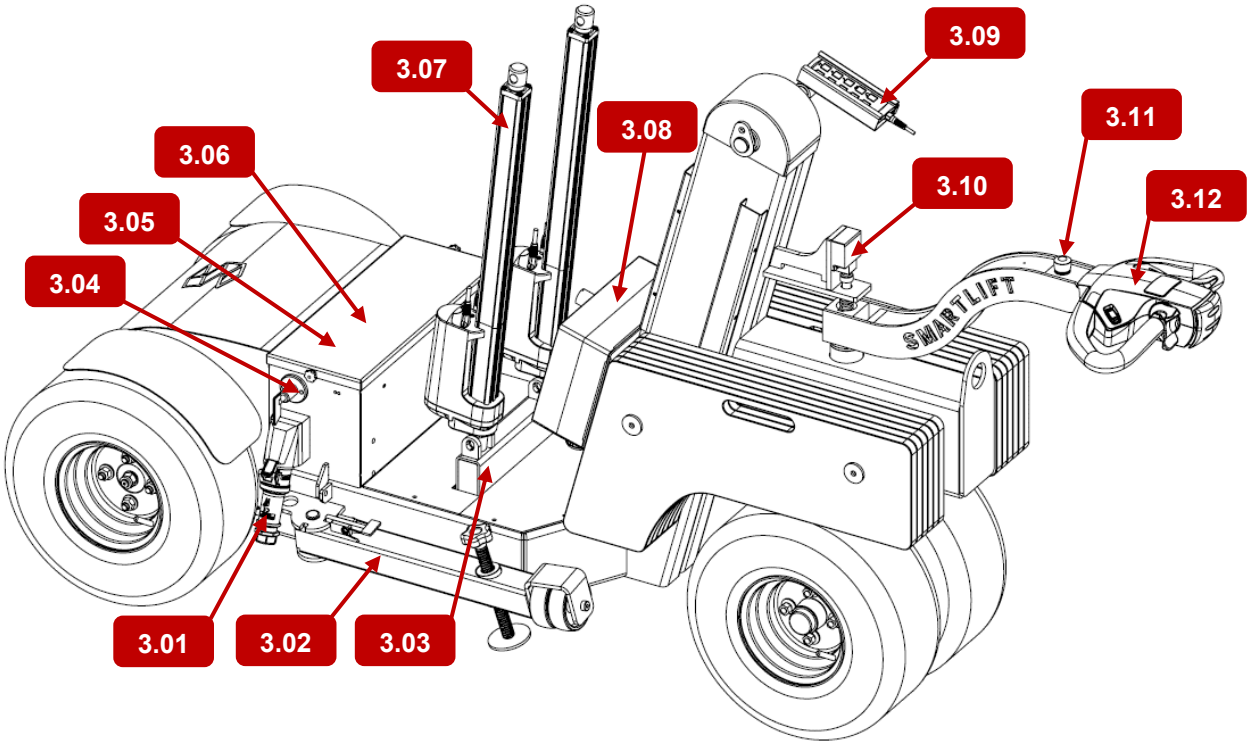
No.	Description	No.	Description	No.	Description
1.01	Yoke	1.03	Suction cup holder	1.05	Suction cup
1.02	Crossbar	1.04	Hand screw		

3.1.2 Boom



No.	Description	No.	Description	No.	Description
2.01	Turning head	2.04	1. Extension boom	2.07	2. Extension actuator
2.02	Rotator	2.05	Main boom	2.08	Tilt actuator
2.03	2. Extension boom	2.06	1. Extension actuator	2.09	Tower light

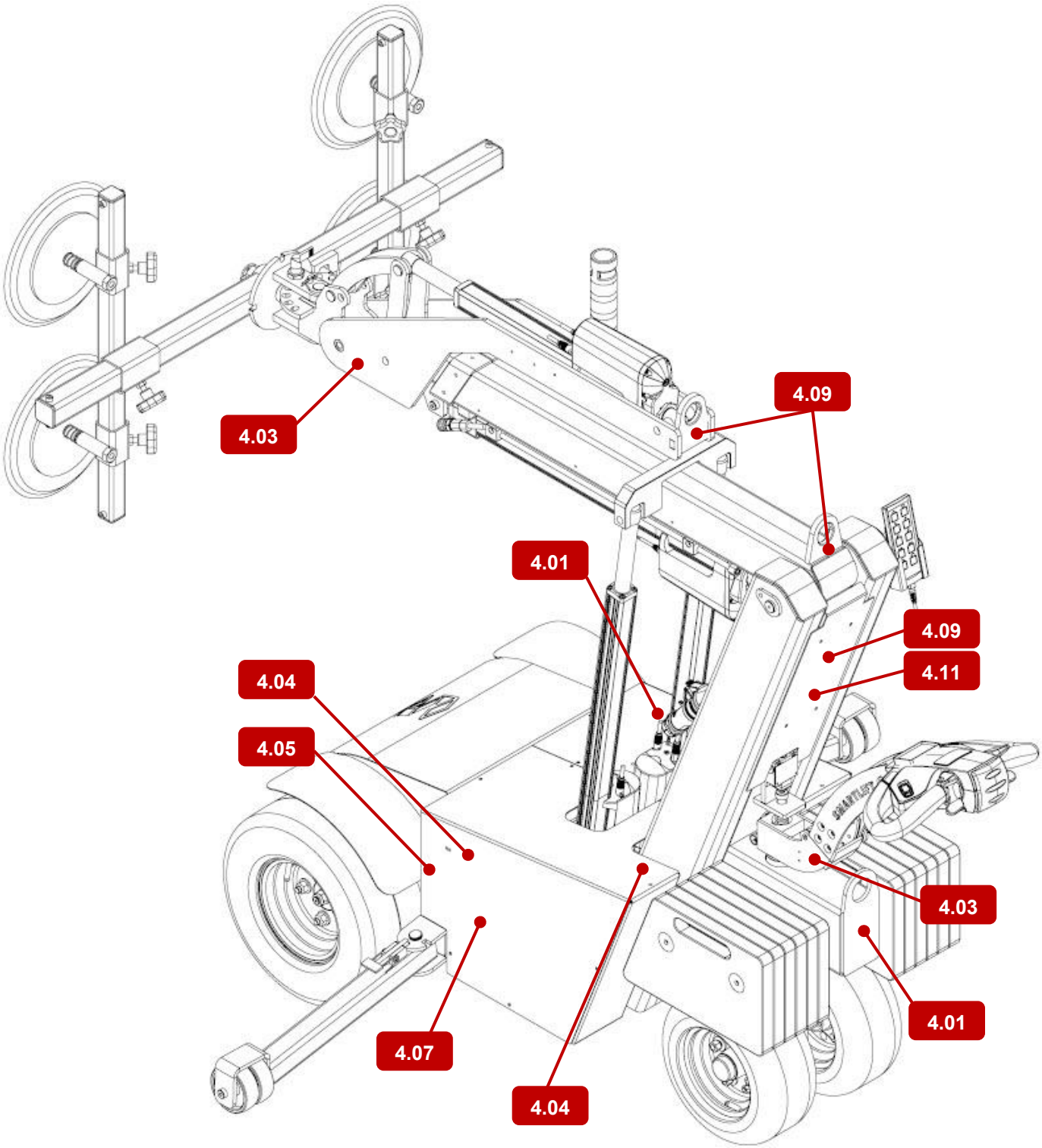
3.1.3 Base machine



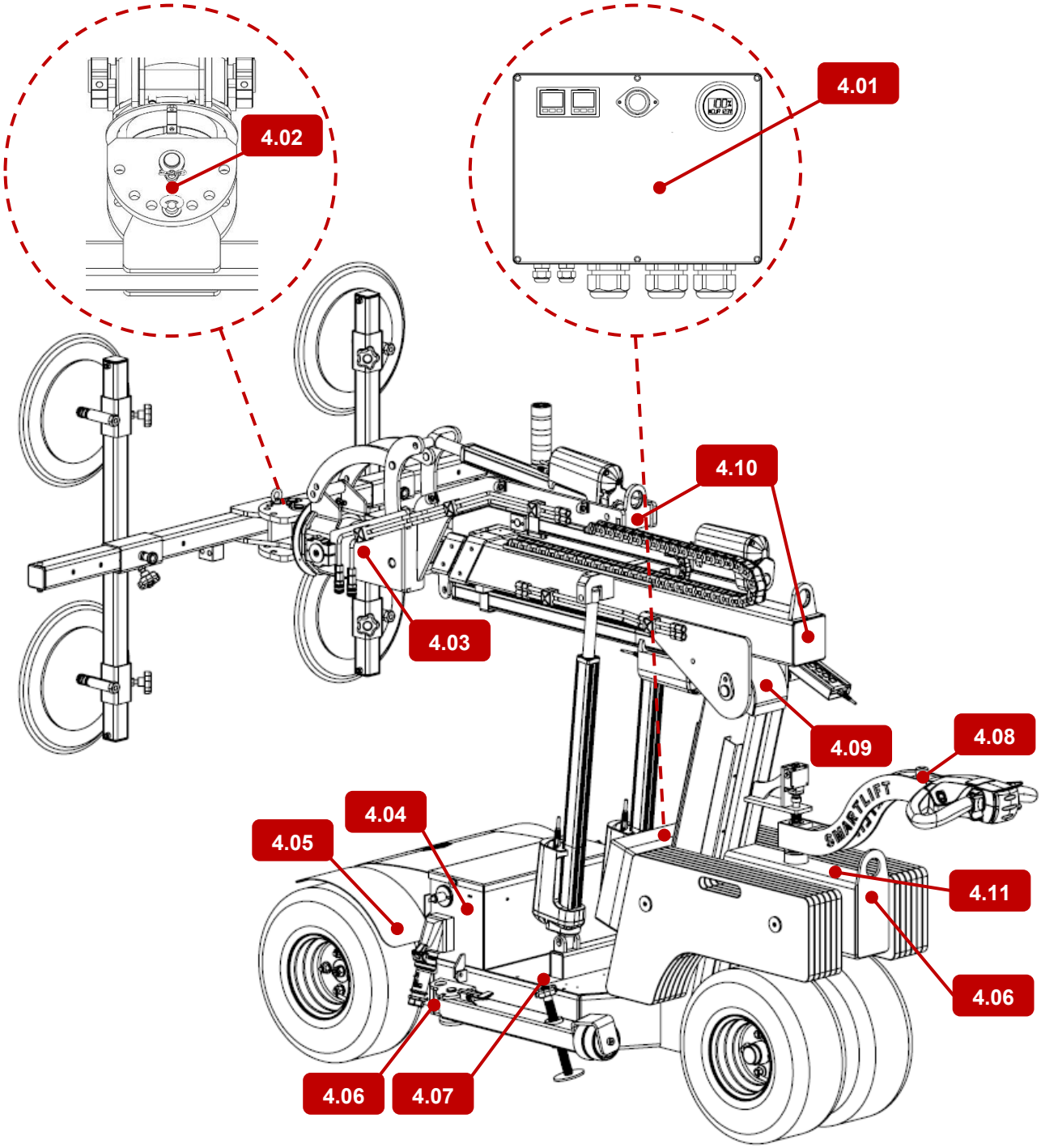
No.	Description	No.	Description	No.	Description
3.01	Charging plug	3.05	Charger (in battery case)	3.09	Remote control
3.02	Support leg	3.06	Battery case	3.10	Load limit switch
3.03	Tilting joint	3.07	Lifting actuator	3.11	Emergency stop
3.04	Main switch	3.08	Control box	3.12	Control handle

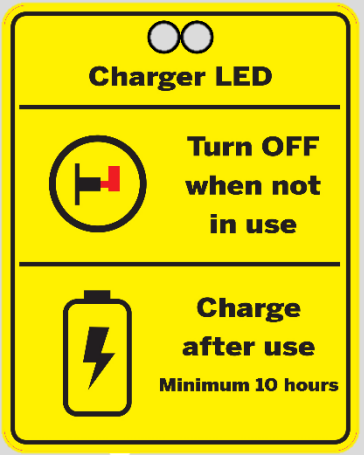
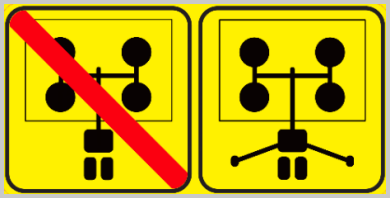
3.2 Label overview

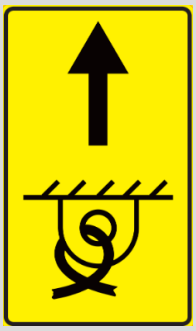
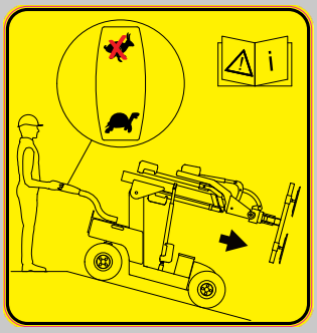
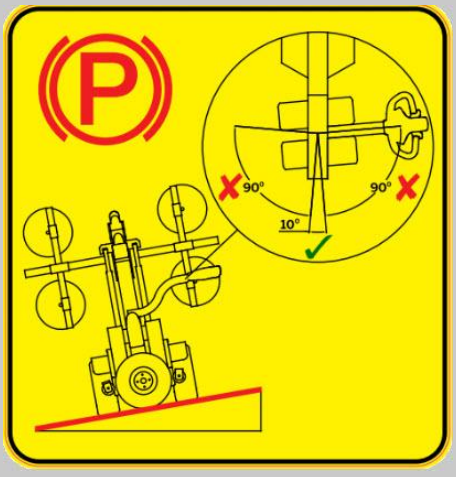
3.2.1 SL 309



3.2.2 SL 409 – SL 609



No.	Description	Labels
4.01	Read the user manual before use. Use safety footwear. It is forbidden to stay under or in front of the machine when it is loaded. It is forbidden to sit on the machine. It is forbidden to stand on the machine. It is forbidden to use high-pressure washer to clean the machine.	
4.02	Load on the side of the machine is only for transport and maximum: SL/SLI 409 RT max 250 kg (550 lb) SL/SLI 609 RT max 400 kg (880 lb)	
4.03	Crushing hazard	
4.04	Charger LED. Switch off the machine when not in use. Charge the machine after use, minimum 10 hours.	
4.05	Fold out support legs when hoisting and transporting loads	

4.06	Lashing eye	
4.07	Do NOT lift under the machine	
4.08	Emergency stop	
4.09	Always drive down slopes at low speed (turtle) and with great caution	
4.10	Lashing and hoisting eye	
4.11	Parking on a slope	

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.

3.3 Technical specifications

3.3.1 SL 309

Machine model	SL 309	SL 309 RT
WLL	350 kg 770 lb	
Curb weight	620 kg 1370 lb	625 kg 1380 lb
Total length	2,11 m 83 in	2,20 m 87 in
Transport length	1,69 m 67 in	1,74 m 69 in
Transport height	1,42 m 56 in	
Width	0,82 m 32 in	
Driving speed, up to	6 km/t 3,7 mph	
Operating time, up to	10 hours	
Suction cups (4 pcs. with diameter of)	300 mm 12 in	
Vacuum level	-0,53 bar / -0,63 bar	
Batteries (2pcs.)	12 V	
Charger, standard	230 V	
Charger, option	110 V	
Charging time, minimum	10 hours	
Sound level	82 dB (A) 85 dB (C)	
Expected service life	10 years	

3.3.2 SL 409

Machine model	SL 409	SL 409 HL	SL 409 HLE	SL 409 HLE RT
WLL	430 kg 950 lb			
Curb weight	700 kg 1540 lb	710 kg 1570 lb	720 kg 1590 lb	730 kg 1610 lb
Total length	2,50 m 98 in	2,60 m 102 in	2,59 m 102 in	
Transport length	2,09 m 82 in	2,18 m 86 in		2,16 m 85 in
Transport height	1,39 m 55 in	1,40 m 55 in	1,43 m 56 in	
Width	0,82 m 32 in			
Driving speed, up to	6 km/t 3,7 mph			
Operating time, up to	10 hours			
Suction cups (4 pcs. with diameter of)	300 mm 12 in			
Vacuum level	-0,62 bar / -0,72 bar			
Batteries (2pcs.)	12 V			
Charger, standard	230 V			
Charger, option	110 V			
Charging time, minimum	10 hours			
Sound level	82 dB (A) 85 dB (C)			
Expected service life	10 years			

3.3.3 SL 609

Machine model	SL 609 HL	SL 609 HLE	SL 609 HLE RT
WLL	600 kg 1320 lb		
Curb weight	930 kg 2050 lb	940 kg 2070 lb	950 kg 2090 lb
Total length	2,79 m 110 in		2,9 m 114 in
Transport length	2,26 m 89 in	2,24 m 88 in	2,37 m 93 in
Transport height	1,51 m 59 in	1,54 m 61 in	
Width	0,83 m 33 in		
Driving speed, up to	6 km/t 3,7 mph		
Operating time, up to	10 hours		
Suction cups (4 pcs. with diameter of)	400 mm 16 in		
Vacuum level	-0,53 bar / -0,63 bar		
Batteries (2pcs.)	12 V		
Charger, standard	230 V		
Charger, option	110 V		
Charging time, minimum	10 hours		
Sound level	82 dB (A) 85 dB (C)		
Expected service life	10 years		

3.3.4 SLI 409

Machine model	SLI 409	SLI 409 HLE
WLL	430 kg 950 lb	
Curb weight		
Total length	2,22 m 87 in	2,32 m 91 in
Transport length	1,83 m 72 in	1,90 m 75 in
Transport height	1,38 m 54 in	1,42 m 56 in
Width	0,82 m 32 in	
Driving speed, up to	6 km/t 3,7 mph	
Operating time, up to	10 hours	
Batteries (2pcs.)	12 V	
Charger, standard	230 V	
Charger, option	110 V	
Charging time, minimum	10 hours	
Sound level		
Expected service life	10 years	

3.3.5 SLI 609

Machine model	SLI 609 HLE
WLL	600 kg 1320 lb
Curb weight	
Total length	2,52 m 92 in
Transport length	1,99 m 78 in
Transport height	1,54 m 61 in
Width	0,83 m 33 in
Driving speed, up to	6 km/t 3,7mph
Operating time, up to	10 hours
Batteries (2pcs.)	12 V
Charger, standard	230 V
Charger, option	110 V
Charging time, minimum	10 hours
Sound level	
Expected service life	10 years

3.4 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.

3.4.1 Materials (SL)

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 on dirty, dusty, wet or greasy objects!**

⚠ **WARNING! Never use the machine to lift objects that cannot be closed airtight with the suction cups!**

3.4.2 Lifting capacity

See the machine's lifting capacity (WLL) in conjunction with its reach in section **10.3 Load charts SL / 10.4 Load charts SLI**.

3.4.3 Wind impact

Wind greatly impacts the stability of the machine, particularly when lifting large items. Therefore, it is important to assess the wind conditions before starting work. The table below can be used as an indicator of the percentage by which the working load limit (WLL) is reduced under certain wind conditions.

	Wind load index										
	Area		m2	1	2	3	4	5	6	7	8	9
	Speed		sqft	10,8	21,5	32,3	43,0	53,8	64,6	75,3	86,1	96,8
	m/s	mph										
Slight wind	1	2,2		100	100	100	100	100	100	99	99	99
	2	4,5		100	99	99	99	98	98	98	98	97
	3	6,7		99	99	98	97	97	96	95	94	94
Light wind	4	8,9		99	98	96	95	94	93	91	90	89
	5	11,2		98	96	94	92	90	88	86	85	83
	6	13,4		97	94	92	89	86	83	81	78	75
Brisk wind	7	15,7		96	92	89	85	81	77	74	70	66
	8	17,9		95	90	85	80	75	70	65	60	56
	9	20,1		94	88	81	75	69	63	56	50	44
Strong wind	10	22,4		92	85	77	69	61	54	46	38	31
	11	24,6		91	81	72	63	53	44	35	25	16
	12	26,8		89	78	67	56	44	33	22	11	0

An example using an SL 609 HLE RT:

At a distance of *1.25 m (4.1 ft)* from the front wheel, an SL 609 HLE RT can lift up to *390kg (860lb)* (see section **10.3.9 SL 609 HLE RT**). At a wind speed of *8 m/s (17.9 mph)* lifting an item with a surface area of *4 m^2 (43 sqft),* the wind load index reads as *80%*

This means that the maximum load is reduced to *390kg (860lb)* x 0,8 = *312kg (688lb)*.

As mentioned, the above table provides an indication of how to take wind impact into account, but it is the user's responsibility to assess the stability of the machine, as turbulence, wind direction, humidity, etc. also influence this.

If there is doubt as to the stability of the machine, you can get a feel of whether the load limit switch is almost letting go by grabbing the counterweights and lifting them gently. If the load limit switch lets go, the limit has been reached.

3.4.4 Temperature and humidity

Permissible temperature range	From -20°C to 40°C
Permissible relative humidity (non-condensing)	From 20% to 80%
Optimum temperature when charging	From 10°C to 25°C

3.4.5 Lighting

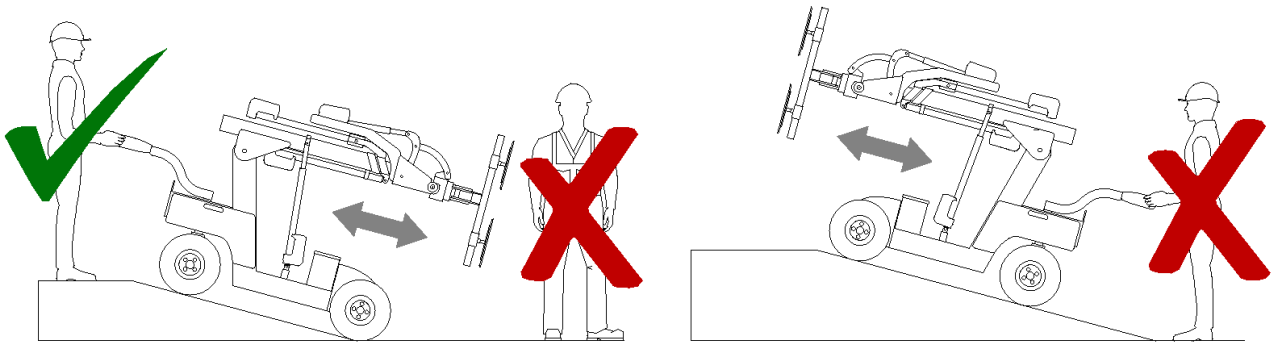
Workspace	Min 200 lux
Repair and maintenance work	Min 500 lux

3.4.6 Surface

When using the machine, a solid surface is important. This applies during both the driving and handling of objects. If the surface is soft, it is a great advantage to use ground protection mats.

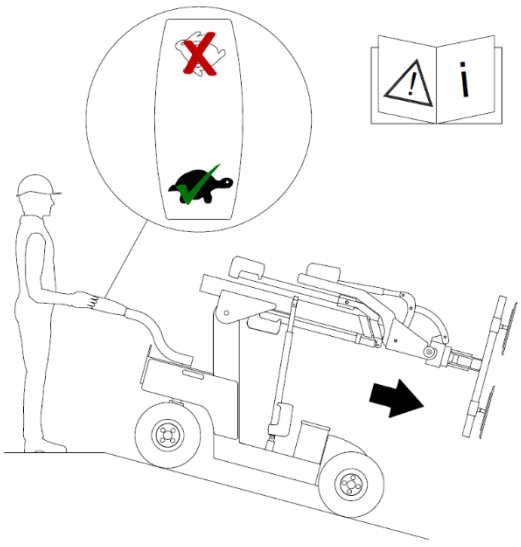
3.4.7 Slope – Location of user and person

When driving on a slope, the user must be aware of their own and others' positions in relation to the machine.



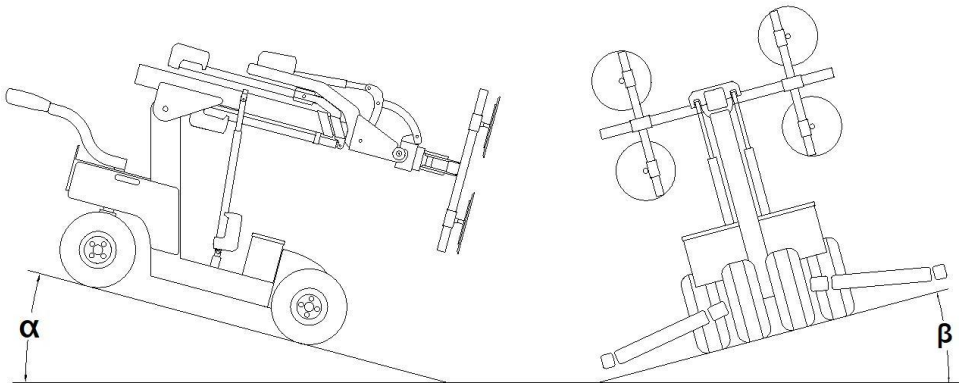
⚠ WARNING!

- **Never stand below the machine when it is moving up or down a slope!**
- **Always drive at low speed and exercise caution when going down a slope!**



3.4.8 Slope – without load

When driving on slopes without a load, the below values cannot be exceeded, as this may increase the risk of losing control of the machine and overturning:

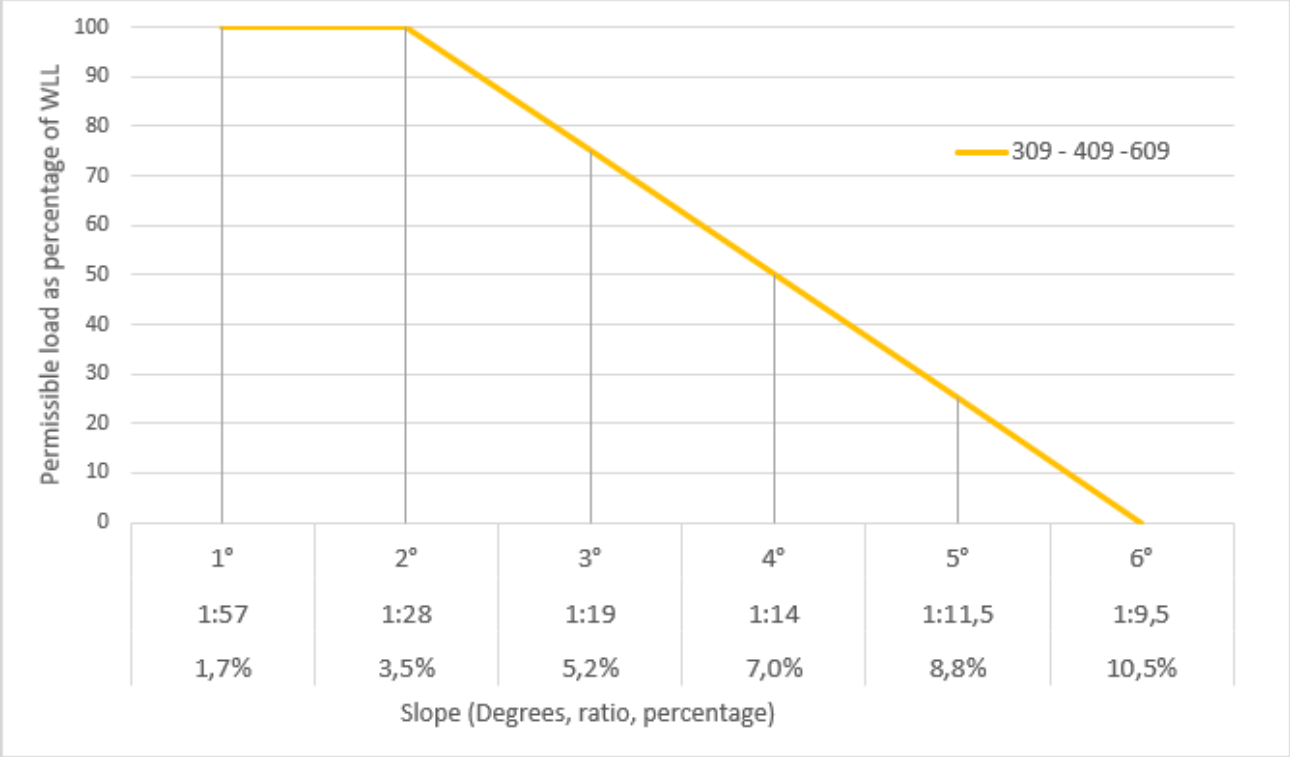


Max slope α	6
	1:9,5
	10,5%
Max slope β	6
	1:9,5
	10,5%

3.4.9 Slope – with load

When driving a loaded machine on slopes, the below chart can be used as a guide.

⚠ **WARNING! The shape and weight of the load, the speed of the machine, and weather conditions all affect the stability of the machine when driving on a slope. Therefore, always assess whether moving it is sensible!**



Example of a load situation:

- Machine: SL 609 with WLL 600 kg (1320 lb)
- Surface sloping in the direction of travel: 3° / 1:19 / 5.2%
- Permissible load as a percentage of WLL: 75%

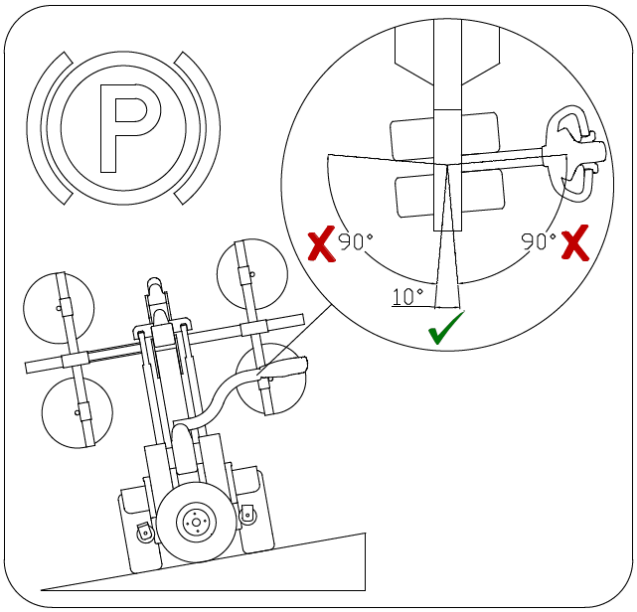
$WLL_{slope} = WLL_{machine} * Permissible\ load\ as\ percentage$

$WLL_{slope} = 600kg\ (1320lb) * 0{,}75 = 450kg\ (990lb)$

3.4.10 Slope – Parking

When parking the machine across a slope, the handlebar must be aligned with the longitudinal direction of the machine ±5°.

⚠ **If the handlebar is turned to the sides this could cause the machine to start rolling down the slope!**



3.4.11 Height above sea level

When working with the machine at heights of more than 1000 m (3280 ft) above sea level, the table below can be used as a guideline.

Height above sea level		Vacuum level
Meters	Feet	Max. possible in height
< 1000 m	< 3280 ft	100 %
1000 m	3280 ft	87 %
2000 m	6560 ft	75 %
3000 m	9840 ft	65 %
4000 m	13120 ft	56 %

Eksempel when working at height:

- Machine: SL 609 with WLL 600 kg (1320 lb)
- Height above sea level: 2000 m (6560 ft)
- Max. possible vacuum level at height: 75 %

$$WLL_{height} = WLL_{machine} * Max.possible\ vacuum\ level\ at\ height$$

$$WLL_{height} = 600\ kg\ (1320\ lb) * 0{,}75 = 450\ kg\ (990\ lb)$$

4 Operation

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 Before operation

WARNING!

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

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:

- Operation limits (See section **3.4 Operating limits**).
- Lifting capacity (See section **10.3 Load charts SL / 10.4 Load charts SLI)**.
- Battery level.

4.2 Operation in general

The following describes a typical procedure for using the machine. For a more detailed description of functions, buttons, etc., see section **4.6 Functional overview**.

1. Turn on the machine using the main switch.
2. Check the battery level.
3. Activate propulsion on the control handle On/off button.
4. Drive the machine to the object.
   ATTENTION! When driving on terrain, the support legs must be deployed and locked!
5. Centre the machine in front of the object. If necessary, fine-tune the position using the side shift function.
6. Deploy the support legs.
7. Adjust the suction cups to fit the object.
   ATTENTION! The distance between the suction cups must be as great as possible!
8. Push the suction cups against the object using the extension function.
   WARNING! Never use the machine on dirty, dusty, wet or greasy objects!
   WARNING! Never use the machine to lift objects that cannot be closed airtight with the suction cups!
9. Activate vacuum.
   ATTENTION! Alarm signal sounds if there is insufficient vacuum!
10. Lift and transport the object.
    ATTENTION! Transport the object as close to the surface and the machine as possible!

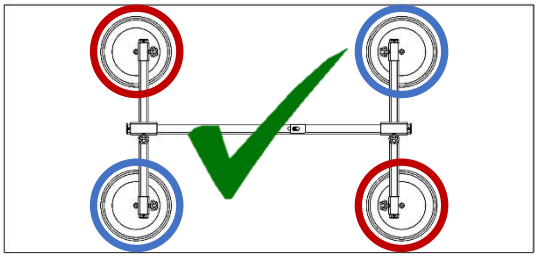
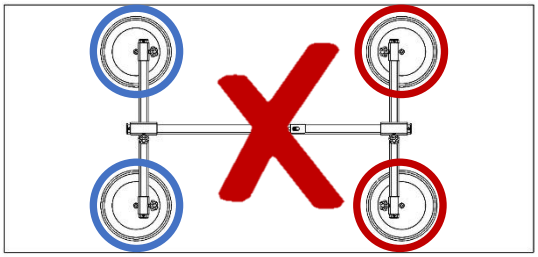
11. Place the item in the desired position and fasten.
12. Disable vacuum.
    ATTENTION! Wait for the machine's suction cups to release the object!
13. When handling several objects, repeat steps 2 through 12.
14. Turn the machine off at the main switch.
    ATTENTION! Do not use the emergency stop to turn off the machine!
15. Charge the machine at the end of the working day.

4.3 Operating functions

This section visualises where hazardous situations may occur when using the machines.

4.3.1 General:

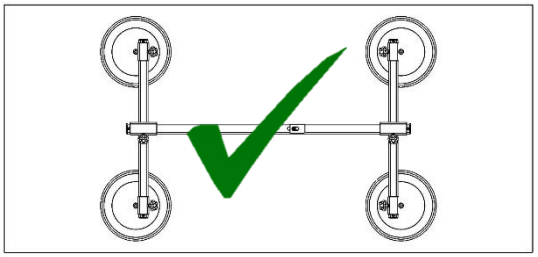
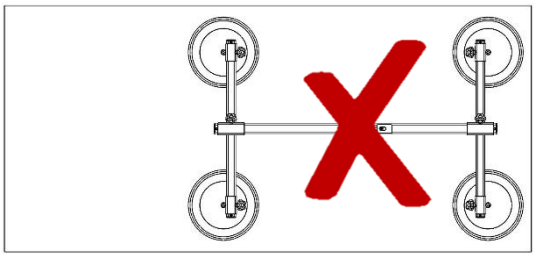
- **ATTENTION! Before activating the actuators for lifting, extension or tilting, please note the following:**
  - The vacuum yoke or load can hit the machine or the surface.
- **ATTENTION! Before suction is applied to the load:**
  - The suction cups must be connected to the vacuum circuits diagonally.

WARNING! If the suction cups are not connected diagonally, there is a risk of the load being pulled off the cups and the machine tipping over if one of the vacuum circuits fails!

  - The support legs must be deployed and locked when lifting or transporting loads.
  - The hand screws on suction cup holders and crossbars must be tightened.
  - 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 the machine will tip over!

- **ATTENTION! Before the load is lifted:**
  - The machine must be level.
  - The positioning bolt on the swivel joint must be engaged.
  - The positioning bolt for the vacuum must be engaged.
  - The vacuum pumps must stop (sufficient vacuum has been achieved)
- **ATTENTION! Before the vacuum yoke is rotated (manually):**
  - The positioning bolt on the swivel joint must be engaged.
  - The vacuum yoke and load can hit the machine or the surface.
  - Vacuum hoses can get pinched or stretched.
- **ATTENTION! Before the load is rotated to the side of the machine:**
  - The tilt head must be level in both directions.

- The vacuum yoke may only be placed on the side of the machine during the transport of objects. The load must be kept as close to the surface as possible!
- The positioning bolt must be engaged.
- The vacuum yoke and load can hit the machine or the surface.
- Vacuum hoses can get pinched or stretched.

⚠ **WARNING! When the load is rotated onto the side, it creates a risk that the machine will tilt, as the safety switch only detects an absence of load on the rear wheels!**

4.3.2 HL models:

- **ATTENTION! Before the manual extension is adjusted:**
  - The boom must be level and free from any load.
  - Fingers can get trapped when the shaft and the split are moved or when the extension is adjusted.

4.3.3 RT models:

- **ATTENTION! Before the yoke is rotated (electric):**
  - The locking shaft and split must be installed on the tilt head.
  - The vacuum yoke and load can hit the machine or the surface.
  - Vacuum hoses can get pinched or stretched.

4.3.4 All 609 models:

- **ATTENTION! Before the load is lifted:**
  - Plates on support legs are adjusted downwards so that there is a distance of between 15 mm (0.6 in) and 30 mm (1.2 in) between them and the surface.

4.4 Signals

A tower light (red, yellow and green) with a built-in acoustic alarm is mounted on the machine, which gives signals about the machine's status. The table describes the signals:

Signal		Status description
Red – Flash and sound		The machine is loaded with 100% of maximum capacity
Red – Constant		Critical error on the machine
Yellow – Flash		Charger connected
Yellow – Constant		Warning / information about errors on the machine
Green - Flash		The machine in motion, functions are activated by the operator or vacuum is activated
Green - Constant		The machine is in standby, no functions are used

In the panel on the control box, the current battery level (%), voltage level (volts) and hour counter (hours) for total and operation, respectively, can be read. In the event of an error, the current code(s) will be displayed. A description of this can be found in the service manual.

4.5 After operation

In order to ensure optimum preservation of battery capacity, use the following charging pattern:

- Connect the charger for at least 10 consecutive hours before using the machine.
- Connect the charger after the end of the working day. This maintains the capacity of the batteries.
- Connect the charger permanently when storing the machine. This maintains the batteries at a constant rate.

ATTENTION! It is not possible to use and charge the machine at the same time!

ATTENTION!

- **Charging must take place somewhere with good ventilation!**
- **Charging can never take place in a location where there are sparks, flames or smoking!**
- **Charging is recommended to take place at a temperature cf. section 3.4.4 Temperature and humidity!**
- **The machine must be switched off at the main switch before charging!**
- **If the charger is connected for a period of time which is shorter than recommended, over time, the battery capacity will be reduced permanently!**
- **If the machine is stored for a long period of time without the charger being connected to a power supply, the battery capacity will be reduced permanently!**
- **The machine must be charged before the voltage on the batteries falls below 22V, otherwise the batteries will be permanently damaged!**

4.5.1 Charger – LED indications

Seen location of LED indicators in section **4.6 Functional overview**.

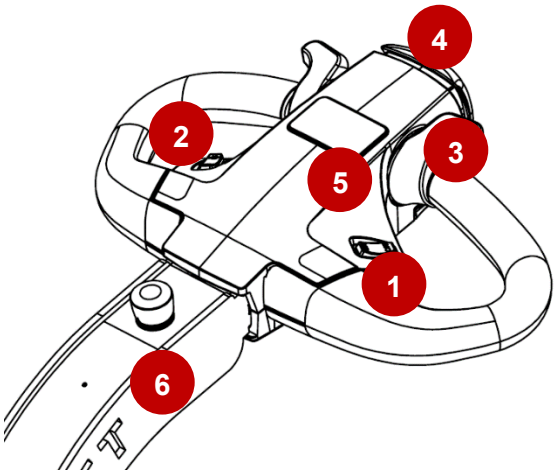
Battery charger 230V	
LED	**Description**
● ○	Connected supply/storage mode
● ☼	Quick flashing – fast charging
● ☼	Slow flashing – reduced charging
● ●	Fully charged

Battery charger 110V	
LED	**Description**
○ ●	Fast charging
● ●	Reduced charging
● ○	Fully charged – Maintenance

4.6 Functional overview

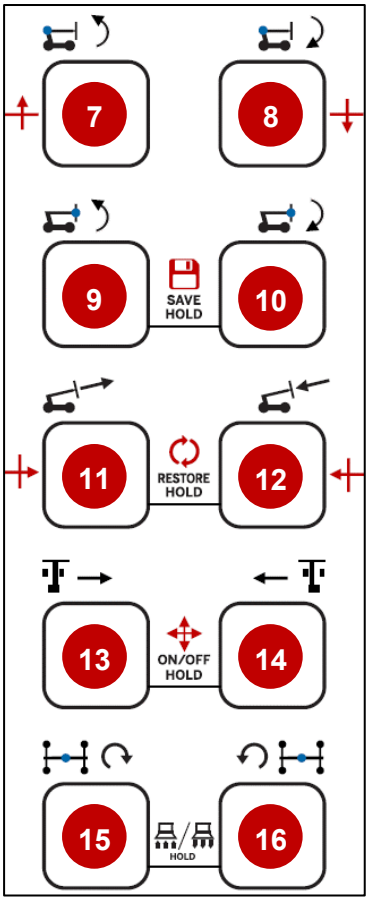
Control handle with buttons for propulsion

No.	Description
1	On / Off button for propulsion
2	High (hare) / low (turtle) travel speed and actuator speed
3	Speed and direction regulator
4	Safety switch
5	Horn switch
6	Emergency stop



Control panel for hoisting functions, etc.

No.	Description
7	Raise boom Vertical up*
8	Lower boom Vertical down*
9	Tilt backward
10	Tilt forward
9+10	Save position*
11	Extend boom Horizontal forward*
12	Retract boom Horizontal backward*
11+12	Restore position
13	Sideshift to the right
14	Sideshift to the left
13+14	Activate / deactivate linear motion*
15	Rotation clockwise**
16	Rotation counter-clockwise**
15+16	Activate / deactivate vacuum

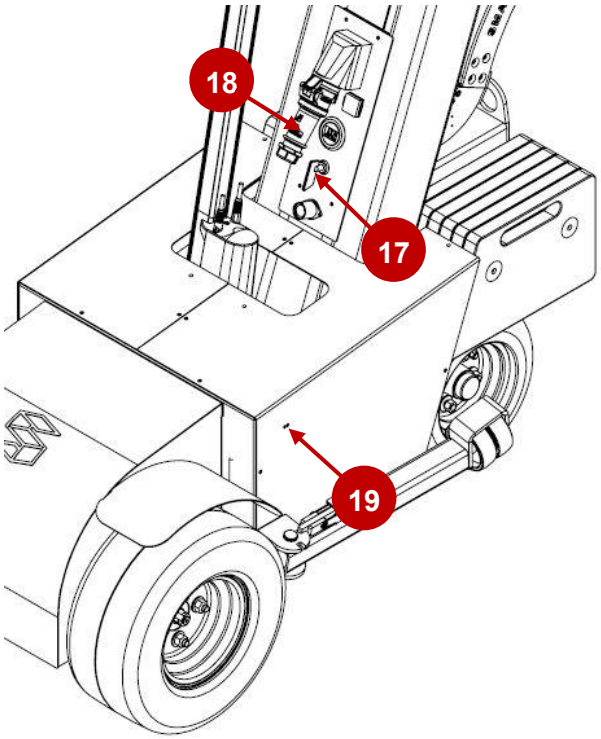


*Option

**Only RT-models

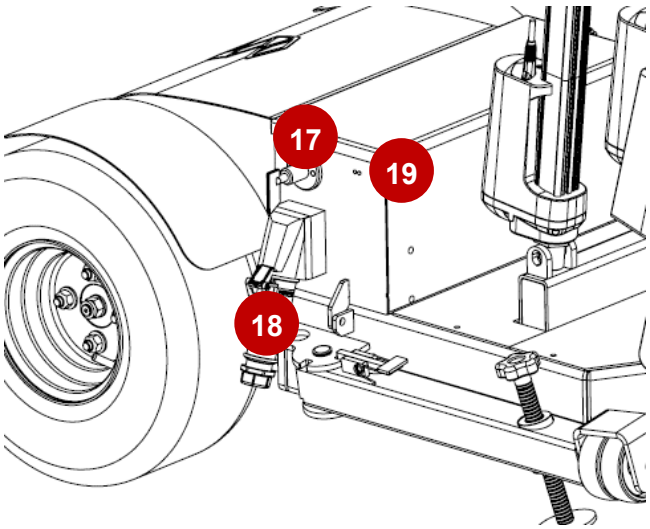
Power 309

No.	Description
17	Main switch
18	Charging plug
19	Charger – LED indicators



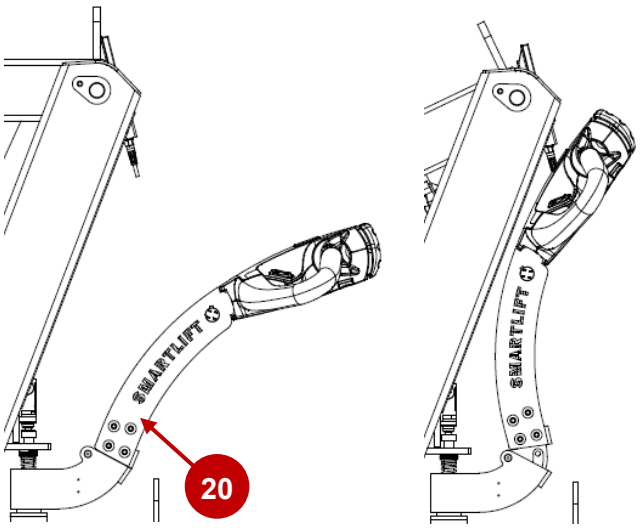
Power 409 -609

No.	Description
17	Main switch
18	Charging plug
19	Charger – LED indicators



Foldable handlebar 309

No.	Description
20	Foldable handlebar



4.7 Functional description

No.	Description	Function
1	On / Off button for propulsion	Off: Interrupts propulsion. Can be used if accidental activation of propulsion must be eliminated
2	High (hare) / low (turtle) travel speed	Switching between high and low speed
3	Speed and direction regulator	Regulator for propulsion. From 0 to max. speed – reverse and forward
4	Safety switch	”Belly button” ensures that the risk of being pinched between the machine and objects is minimized
5	Horn switch	Signals when activated
6	Emergency stop	Interrupts motor and actuators
7	Raise boom Vertical up*	Raise boom (Curved movement) Moves the yoke vertically up when linear motion is activated
8	Lower boom Vertical down*	Lower boom (Curved movement) Moves the yoke vertically down when linear motion is activated.
9	Tilt backward	Tilts the yoke backward
10	Tilt forward	Tilts the yoke forward
9+10	Save position* Hold both buttons	Saves the position of the yoke

11	Extend boom Horizontal forward*	Extends the boom Moves the yoke Horizontal forward when linear motion is activated
12	Retract boom Horizontal backward*	Retracts the boom Moves the yoke Horizontal backward when linear motion is activated
11+12	Restore position* Hold both buttons	Moves the yoke to the saved position
13	Sideshift to the right	Moves the yoke and chassis to the right relative to the front wheels
14	Sideshift to the left	Moves the yoke and chassis to the left relative to the front wheels
13+14	Activate / deactivate linear motion* Hold both buttons	Activate / deactivate linear movement of the yoke
15	Rotation clockwise**	Rotates the yoke clockwise
16	Rotation counter-clockwise**	Rotates the yoke counter-clockwise
15+16	Activate / deactivate vacuum Hold both buttons	Activate vacuum (hold both buttons 1 second) Deactivate vacuum (hold both buttons 4 second)
17	Main switch	Cuts power to all functions
18	Charging plug	Connect to mains socket for charging
19	Charger – LED indicators	Indicates charging status. See section **4.5.1 Charger – LED indications**
20	Foldable handlebar***	The handlebar can be folded to reduce the length of the machine e.g. when transport in a van or elevator. Propulsion is Interrupted when the handlebar is folded.

*Option

**Only RT-models

*** Standard on 309 (Option on 409 and 609)

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 batteries!**
- **Drought, sunlight and temperatures below 0°C (32°F) or above 25°C (77°F) may reduce the service life of the suction cups!**

How to store:

- Turn off the main switch.
- Connect the charger so that the batteries are constantly charged and maintained. See section **4.5 After operation**.

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 **3.3 Technical specifications**.

A method for secure fastening of the machine: See section **3.2 Label overview**.

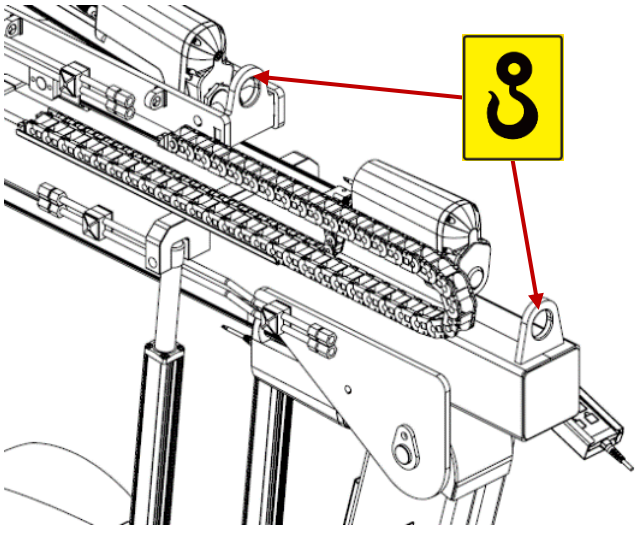
- Turn off the main switch.
- Strap the machine in place using the lashing eye at the rear of the machine.
- Strap the machine in place using the lashing eyes by the support legs.
- Protect the machine's suction cups from rain, moisture and dust. Protective caps can be purchased in addition.

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. The weight of the machine can be found in section **3.3 Technical specifications**. See location of hoisting eyes in section **3.2 Label overview**.

Method for handling and lifting the machine:

- Turn off the main switch.
- Lift the machine in the hoisting eyes.



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 labels.
2.0				**Battery and charger**	
2.1	X	12	X	Battery	Check the capacity of the batteries. Replace the batteries if the voltmeter reads less than 24 volts when the batteries are fully charged. The terminals must be lubricated (A).
2.2	X	12		Charger	Check the charging function: output must be 28 volts when charging.
3.0				**Vacuum system (SL)**	
3.1	X	12		Vacuum gauge	Check red/green LEDs
3.2	X	12	X	Vacuum pumps	See vacuum level in section **3.3 Technical specifications**. If the pressure drops, check and remedy. Replace defective pumps.
3.3	X	12		Vacuum filters	Disassemble 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 **3.3 Technical specifications**. The pumps stop. See vacuum level in section **3.3 Technical specifications**. The acoustic sound and the red light are active when the vacuum level is too low while vacuum is applied to the load.
3.6	X	12		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. Actuators that cannot hold position during load and must be replaced.
4.2	X	12		Cables, cable routes, plugs and connections.	Check all cables for breakage and tightness. Check all plugs and connections for poor connection and proper fastening.

5.0				**Mechanical equipment**	
5.1	X	12		Base machine	Visual inspection. Welds, damage or excessive wear on parts must be repaired or replaced.
5.2	X	12		Side shift	Visual inspection. Welds, damage or excessive wear on parts must be repaired or replaced.
5.3	X	12		Boom	Visual inspection. Welds, damage or excessive wear on parts must be repaired or replaced. Adjust the liner for the extension boom(s).
5.4	X	12		Yoke **(SL)**	Visual inspection. Welds, damage or excessive wear on parts must be repaired or replaced. Lubricate moving parts. (B)
5.5	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)
5.6	X	6		Tighten all bolts according to the manual	Make sure the bolts and screws are secured with Loctite. Bolts on the actuators cannot be retightened.
5.7	X	12	5	Main yoke **(SL)**	Visual inspection. Check the hand screw function. Checks: M24 nut, washer and ring pin. It must be possible to remove and reinstall the yoke easily. Attach the yoke – rotatable. Add end sections and a stop screw if necessary. Damaged parts must be replaced. Lubricate all moving parts (B)
5.8	X	12	5	Crossbars **(SL)**	Visual inspection. Check the hand screw function. Add end sections and a stop screw if necessary. Damaged parts must be replaced. Lubricate moving parts (B)
5.9	X	12	5	Holder for suction cups **(SL)**	Visual inspection. Check the hand screw function. Damaged parts must be replaced. Lubricate moving parts. (B)
6.0				**Electronics and safety equipment**	
6.1	X	1		Main switch	Check the on/off function.
6.2	X	1		Emergency stop	Check the functionality. Repair or replace if necessary.
6.3	X	12		Wired remote control	Check all functions. Remedy if this does not work or is damaged, and repair or replace if necessary.
6.4	X	3		Function check of overload	Use a load to trigger an overload by extending the boom. When the overload is triggered, all functions must be deactivated except retracting of the boom and vacuum. Retract the load until the overload switch disconnects, and all functions should be functional again. Repair or replace if necessary
7.0				**Propulsion system**	
7.1	X	12		Function test of the propulsion system	Check the speed regulator in both directions. Check on/off function on the steering gear. Check slow/turtle and fast/hare. Function test of belly button.

7.2	X	12	X	Check the brake system	With the machine moving at full speed, release the throttle. The machine must stop completely within 2 metres. This must be done in both directions and at both speeds (turtle/hare).
7.3	X	12	X	Check the parking brake	When the machine is stationary, the parking brake must be applied. Test this by pushing and pulling on the machine. It should not be possible to move the machine manually.
8.0				**Static load test**	
8.1	X	12		Test with load Follow the load chart according to the label/manual.	

*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 (SL)

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

ATTENTION!

- **Suction cups should be inspected daily! See section 6.1 Overview of service, maintenance and lubrication intervals.**
- **Vacuum hoses should be inspected monthly or quarterly, 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 machine using the main switch.
2. Check the battery level.
3. Adjust the suction cups to fit the test object.
   WARNING! Never use the machine on dirty, dusty, wet or greasy objects!
   WARNING! Never use the machine to lift objects that cannot be closed airtight with the suction cups!
   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!
4. Push the suction cups against the object using the extension function.
5. Activate vacuum.
   ATTENTION! An alarm signal sounds until sufficient vacuum has been achieved!
6. Monitor the machine's vacuum pumps for at least 10 minutes.
   WARNING! If the vacuum pump starts before 10 minutes have passed, the machine cannot be used! See section **6.5 Troubleshooting**.
7. Deactivate vacuum.
   ATTENTION! Wait for the machine's suction cups to release the object!
8. Turn the machine off at the main switch.

6.2.2 Safety functions

Method for inspection of safety functions

ATTENTION!

- **Security features must be inspected according to section 6.1 Overview of service, maintenance and lubrication intervals!**
- **Security 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!**

- **Main switch**
  - Turn off the main switch.
  - Checks: All moving functions should now be inoperational.
  - Activate the main switch.
  - Checks: All moving functions should be operational again.
- **Emergency stop**
  - Activate the emergency stop by pushing the mushroom emergency stop button manually.
  - Checks: All moving functions should now be inoperational. Vacuum functions **(SL)** are not affected by emergency stop.
  - Deactivate the emergency stop by rotating the mushroom.
  - Checks: All moving functions should be operational again.
- **Safety switch – Belly button**
  - Activate low (turtle) driving speed
  - Activate the speed and direction regulator to put the machine in reverse.
  - Activate the belly button by pushing it manually.
  - Checks: The travel direction must be briefly changed, following which propulsion is interrupted.
  - Deactivate the speed and direction regulator and then repeat the procedure at a high (hare) driving speed.
- **Parking brake**
  - Turn off the main switch.
  - Checks: It must not be possible to push or roll the machine.
- **The support legs**
  - Checks: It must be possible to put the support leg in either position.
  - Checks: Locks for the support leg must be functional in both positions.
- **Load limit switch – Method 1**
  - Lift the rear of the machine so that the rear wheels hover freely above the ground and the load limit switch is interrupted.
    It is recommended that the lashing eye at the rear of the machine is used to do this.
    Regarding requirements for lifting equipment, see section **5.3 Handling and lifting**.
  - Checks: The following features must now be inoperational:
    - Side shift
    - Raise and lower boom
    - Extension of boom
    - Rotation
    - Tilt back and forth
  - Lower the machine again and dismantle the lifting equipment.
  - Checks: All functions must be operational again.

- **Load limit switch – Method 2**
  - Read the load chart on the machine to see what the lifting capacity is at fully extended position. See section **10.3 Load charts SL / 10.4 Load charts SLI**. For example, at fully extended position, the lifting capacity of SL 609 HLE RT will be 100 kg / 220 lb.
  - Then lift a load which exceeds this, and extend this forward until the load limit switch is interrupted.
  - Checks: The following features must now be inoperational:
    - Side shift
    - Raise and lower boom
    - Extension of boom
    - Rotation
    - Tilt back and forth
  - Retract the load and set it down.
  - Checks: All functions must 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!

  ATTENTION! Never direct the jet of water at the engine!
- Clean the control handle using a cloth with soap and water.

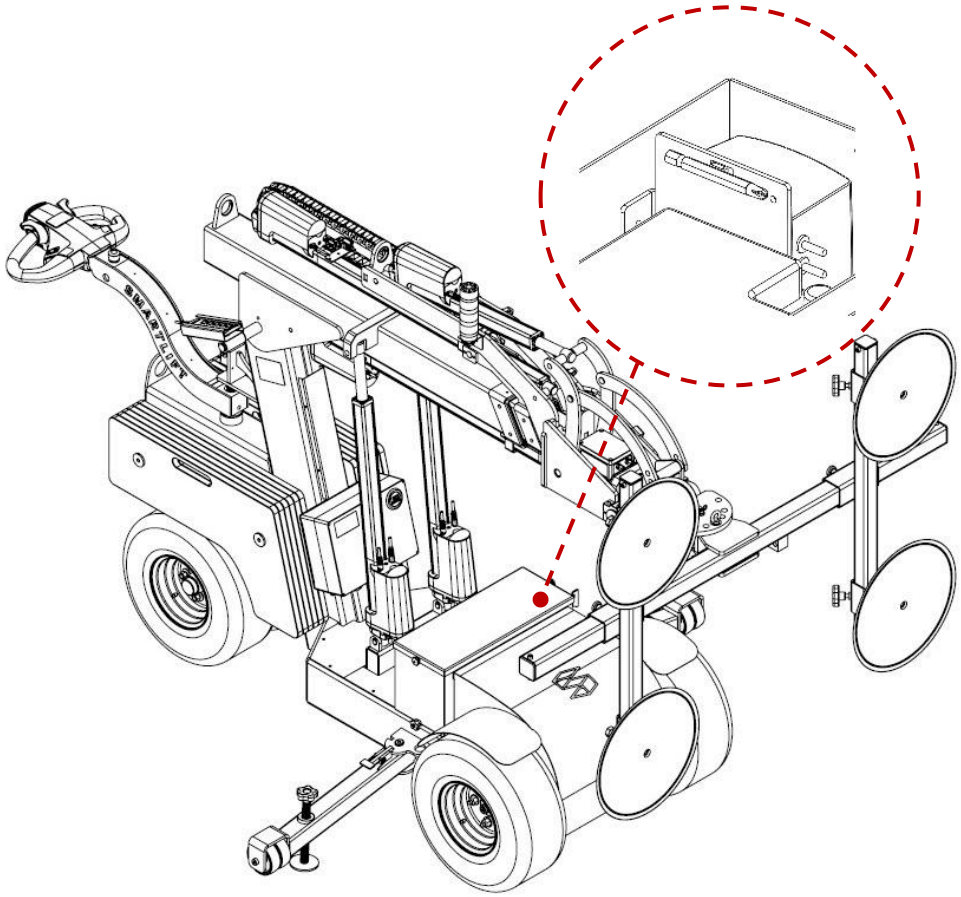
  ATTENTION! Never direct the jet of water at the control handle!
- Clean the suction cups with ethanol.
- Alternatively, the suction cups can be cleaned with hot water, soap and a soft brush.
  - Always rinse with clean water.
  - Let the suction cups dry at room temperature.

  ATTENTION!
  - **Never direct the jet of water at the suction cups or any electronic components!**
  - **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 Access to the electricity box – 609

When opening the electrical cabinet, a special bit is required. This bit is placed in the battery box by the charger. See illustration below.



6.5 Troubleshooting

ATTENTION! In case of unexpected failure or malfunctioning of the machine, the machine must be stopped immediately! 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: • Raising/lowering • Tilt • Extension/ retraction • Sideshift • Propulsion • Rotation	• The power has been interrupted • The batteries have been discharged • The emergency stop has been pushed • Fuse has blown • Charger is connected	• Turn the main switch • Check the battery level • Release the emergency stop • Check fuses
2	No response to: • Raising/lowering • Tilt • Extension • Sideshift • Rotation	• The safety switch has interrupted these functions due to overload • Charger is connected	• Retract the boom

3	No response to:
	• Propulsion
		• The engine has no electricity
		• The brake does not release
		• On/off switch is on “off”
		• Charger is connected
			• Check point 1.
			• Press the “on” button
			  ○ Check fuse for motor control
			  ○ Check fuse for KSI

4	Propulsion is slow	• Battery level is too low	• Charge the machine
5	Functions are slow • Raising/lowering • Tilt • Extension/ retraction • Sideshift • Rotation • Propulsion	• Switch on control handle is set to slow (turtle)	• Switch to fast (hare)
6	Vacuum pump runs frequently or continuously (SL)	• 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 vacuum has been deactivated • **ATTENTION! The vacuum must start and stop again!**

6.6 Error codes

Read error codes in the machine's hour counter / voltmeter.

Error code	Problem	Solution
516099	Low system voltage [below 19v]	Charge the machine
516356	Low voltage signal from vacuum sensor [blue]	Check fuse
516356	Low voltage signal from vacuum sensor [red]	Check fuse
516355	Vacuum level outside limits (with load) [blue]	Lower the load, preform a leakage inspection of the blue vacuum circuit
516358	Vacuum level outside limits (with load) [red]	Lower the load, preform a leakage inspection of the red vacuum circuit
517635	The machine has been idle for 2 hours	Turn off the machine and connect the charger.
517124	Battery capacity low [below 25%]	Charge the machine
517161	Engine (for propulsion) temperature too high	Allow the motor to cool down
517889	Actuator [side shift] interrupted	Check emergency stop and fuse
518145	Actuator [lifting A/1/left] interrupted	Check emergency stop and fuse
518401	Actuator [lifting B/2/right] interrupted	Check emergency stop and fuse
518657	Actuator [extension 1] interrupted	Check emergency stop and fuse
518913	Actuator [extension 2 (HLE)] interrupted	Check emergency stop and fuse
519169	Actuator [tilt] interrupted	Check emergency stop and fuse

For other error codes, contact the nearest dealer or Smartlift's customer service department on tel. +45 97 72 29 11 or via email: Customerservice@smartlift.com.

6.7 Fuses

Fuses on the machine		
Position	**Function**	**Size**
By the powertrain	Propulsion	250A
Under the battery case	Control box	125A

Fuses in control box – Circuit board version 2.0		
Position	**Function**	**Size**
Slot F01	Rotation*	15A
Slot F02	Tilt actuator	20A
Slot F03	2. Extension actuator*	20A
Slot F04	1. Extension actuator	20A
Slot F05	Lifting actuator - B/2/right	20A
Slot F06	Lifting actuator - A/1/left	20A
Slot F07	Sideshift actuator	15A
Slot F08	Charger for wireless remote control*	2A
Slot F09	Extra	
Slot F10	Plus 1 controller	15A
Slot F11	Extra	
Slot F12	Extra	
Slot F13	Emergency stop	2A
Slot F14	Control handle	2A
Slot F15	Constant B+	2A
Slot F16	Tracker B+*	2A
Slot F17	KSI	3A
Slot F18	Vacuum circuit 1 (red)	5A
Slot F19	Vacuum circuit 2 (blue)	5A
Slot F20	Extra J34	

*Option

Fuses in control box – Circuit board version 3.0		
Position	**Function**	**Size**
Slot F01	Rotation*	15A
Slot F02	Tilt actuator	20A
Slot F03	2. Extension actuator*	20A
Slot F04	1. Extension actuator	20A
Slot F05	Lifting actuator - B/2/right	20A
Slot F06	Lifting actuator - A/1/left	20A
Slot F07	Sideshift actuator	15A
Slot F08	Extra	
Slot F09	Extra	
Slot F10	Plus 1 controler	15A
Slot F11	Vacuum circuit 1 (red)	5A
Slot F12	Vacuum circuit 2 (blue)	5A
Slot F13	Control handle	2A
Slot F14	Emergency stop	2A
Slot F15	Constant B+	2A
Slot F16	KSI	3A
Slot F17	Ekstra	
Slot F18	Tracker B+*	2A
Slot F19	Charger for wireless remote control*	2A

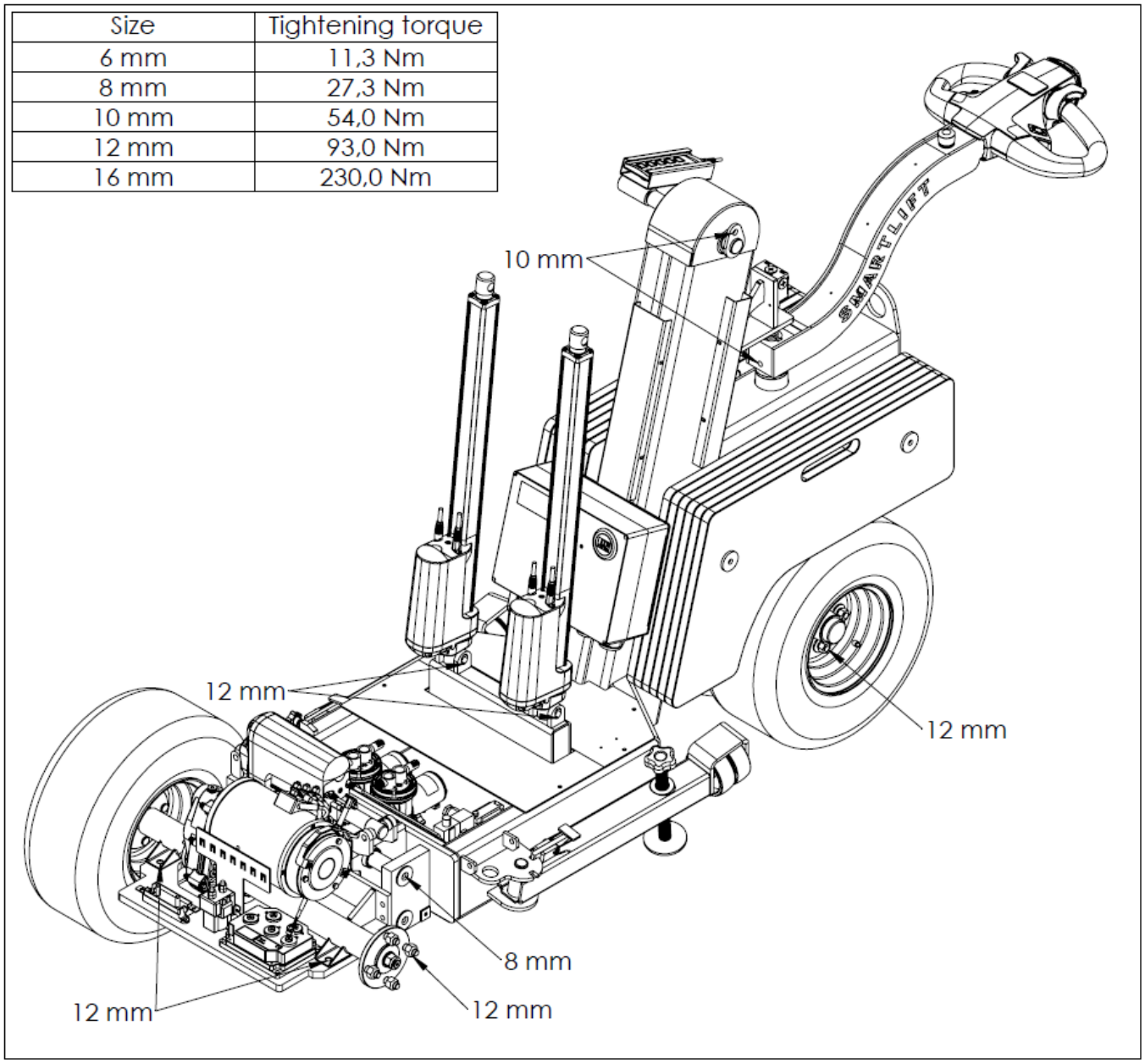
*Option

Fuses in control box – Circuit board version 4.0		
Position	**Function**	**Size**
Slot F01	Extra	
Slot F02	Tilt actuator	20A
Slot F03	2. Extension actuator*	20A
Slot F04	1. Extension actuator	20A
Slot F05	Lifting actuator - B/2/right	20A
Slot F06	Lifting actuator - A/1/left	20A
Slot F07	Sideshift actuator	15A
Slot F08	Extra	
Slot F09	Extra	
Slot F10	Plus 1 controler	15A
Slot F11	Vacuum circuit 1 (red)	5A
Slot F12	Vacuum circuit 2 (blue)	5A
Slot F13	Control handle	2A
Slot F14	Emergency stop	2A
Slot F15	Constant B+	2A
Slot F16	KSI	3A
Slot F17	Rotation*	15A
Slot F18	Tracker B+*	2A
Slot F19	Charger for wireless remote control*	2A

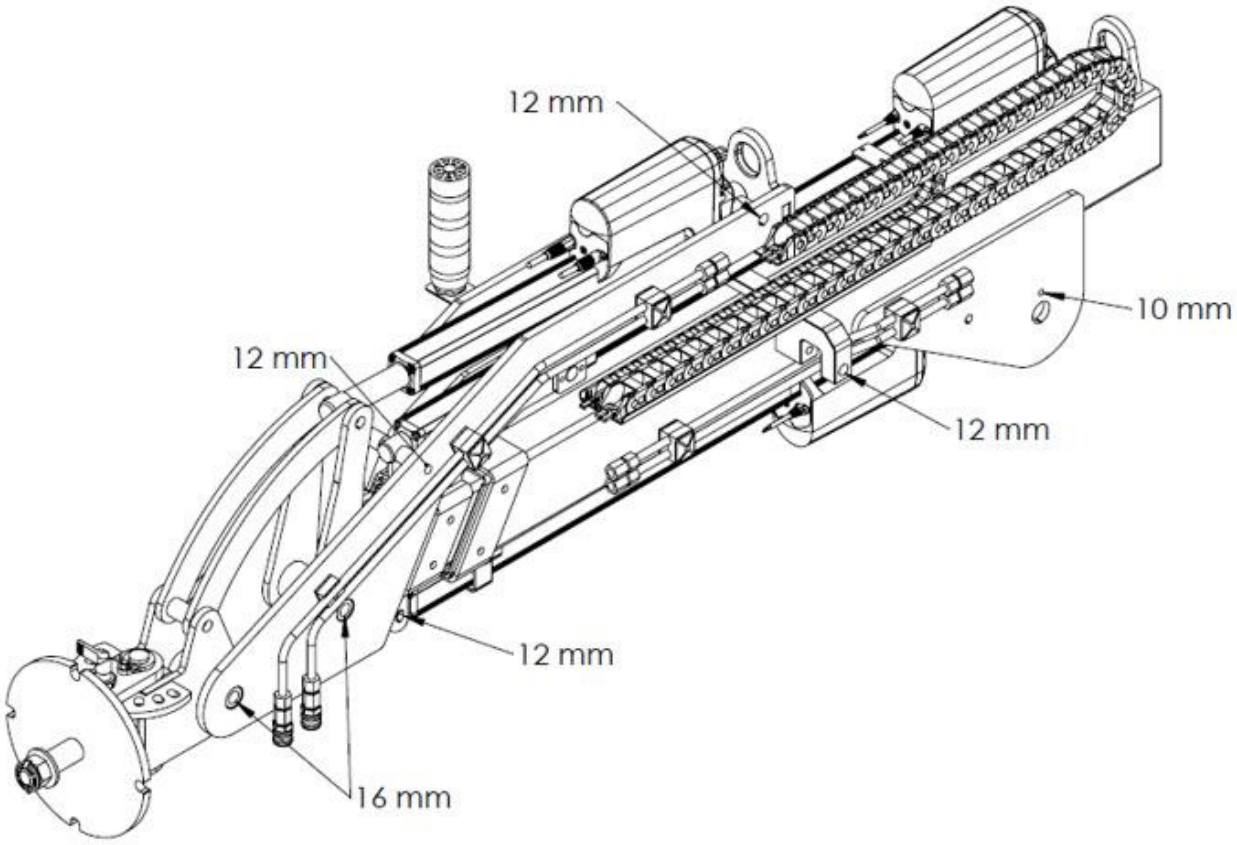
*Option

6.8 Tightening torques

Size	Tightening torque
6 mm	11,3 Nm
8 mm	27,3 Nm
10 mm	54,0 Nm
12 mm	93,0 Nm
16 mm	230,0 Nm



Size	Tightening torque
6 mm	11,3 Nm
8 mm	27,3 Nm
10 mm	54,0 Nm
12 mm	93,0 Nm
16 mm	230,0 Nm



6.9 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.

ATTENTION! When replacing components, the manufacturer's instructions must be followed!

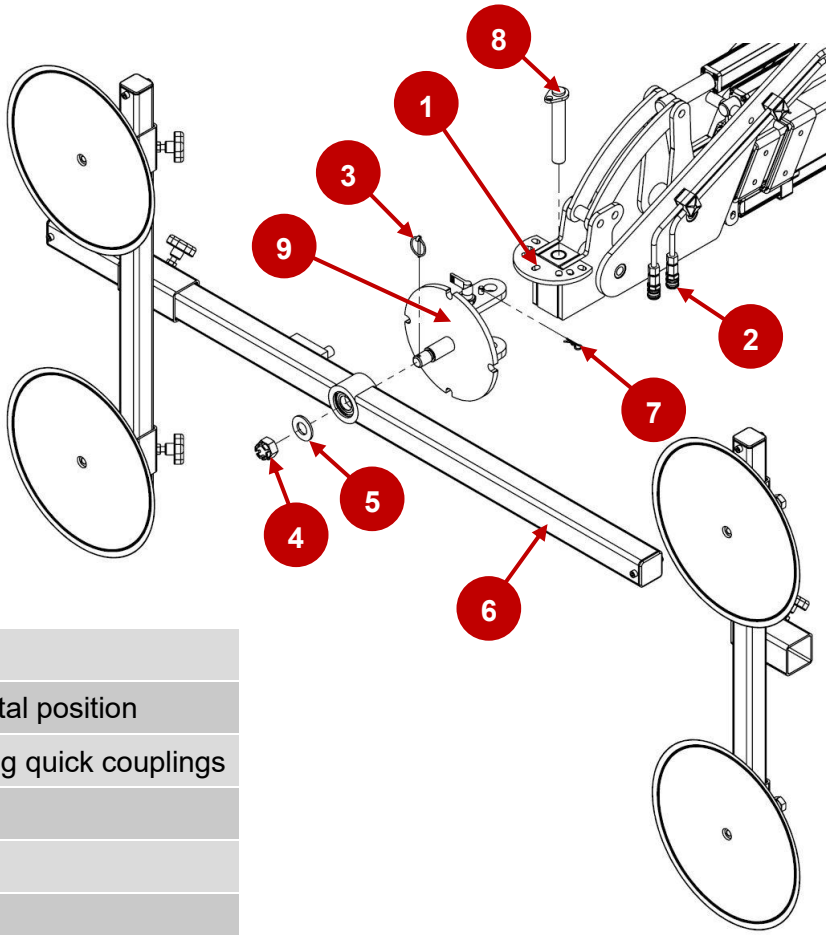
7 Scrapping and disposal

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

8 Dismantling of vacuum yoke and swivel joint (SL)

This describes how the vacuum yoke is removed from the different models of machine.

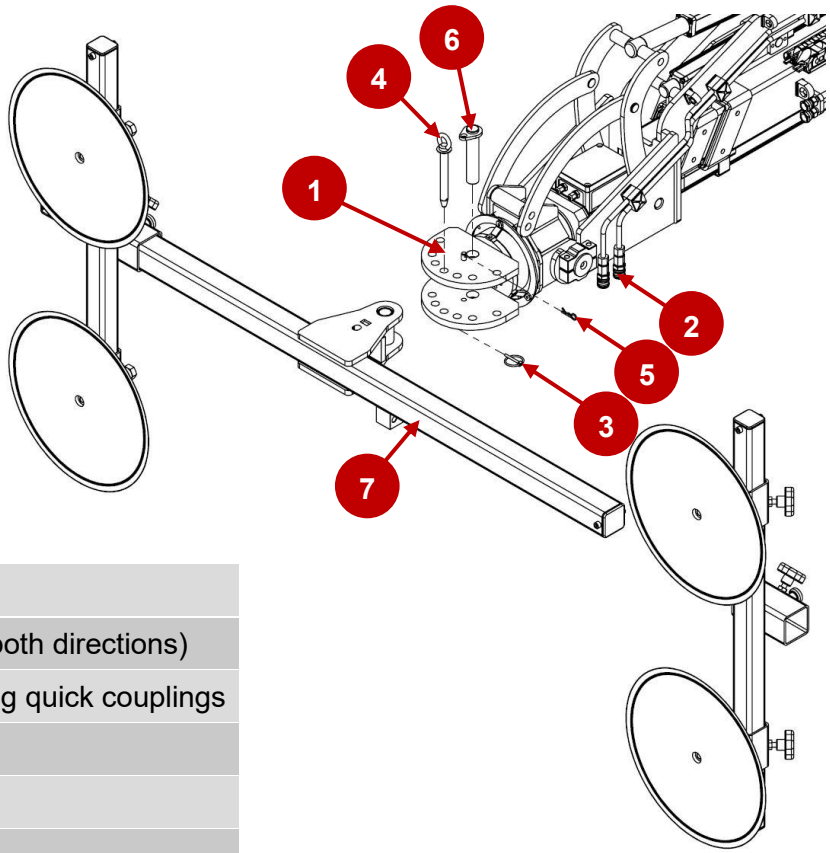
In order to remove the vacuum yoke and swivel joints, the following steps must be completed in the indicated order.



No.	Description
1	Placing the tilt head in the horizontal position
2	Disconnecting vacuum hoses using quick couplings
3	Removing the tractor split
4	Removing the castellated nut
5	Removing the washer
6	Removing the vacuum yoke
7	Removing the hairpin cotter
8	Removing the lock for the swivel joint
9	Removing swivel joint

8.1 Dismantling of vacuum yoke (RT models)

In order to remove the vacuum yoke, the following steps must be completed in the indicated order.



No.	Description
1	Placing the tilt head horizontally (both directions)
2	Disconnecting vacuum hoses using quick couplings
3	Removing the tractor split
4	Removing the locking shaft
5	Removing the hairpin cotter
6	Removing the lock for the tilt head
7	Removing the vacuum yoke

9 Options

9.1 Wireless remote control

The wireless remote control is equipped with double button for functions 1-8.

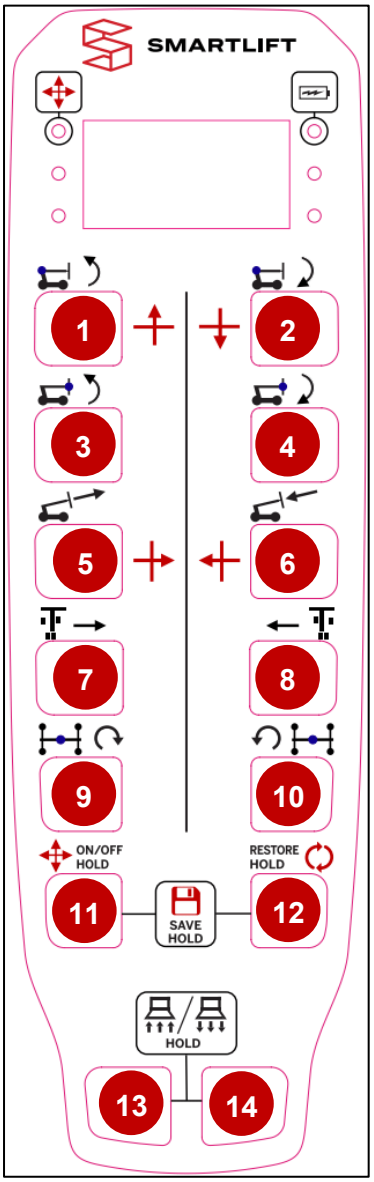
- If a button is pressed halfway down, the function run at half speed.
- If a button is pressed all the way down, the function run at full speed.

Wireless remote control for hoisting functions etc.

No.	Description
1	Raise boom Vertical up*
2	Lower boom Vertical down*
3	Tilt backward
4	Tilt forward
5	Extend boom Horizontal forward*
6	Retract boom Horizontal backward*
7	Sideshift to the right
8	Sideshift to the left
9	Rotation clockwise**
10	Rotation counter-clockwise**
11	Activate / deactivate linear motion*
12	Restore position
11+12	Save position*
13+14	Activate / deactivate vacuum

*Option

**Only RT-models



9.1.1 Functional description for wireless remote control

No.	Description	Function
1	Raise boom Vertical up*	Raise boom (Curved movement) Moves the yoke vertically up when linear motion is
2	Lower boom Vertical down*	Lower boom (Curved movement) Moves the yoke vertically down when linear motion
3	Tilt backward	Tilts the yoke backward
4	Tilt forward	Tilts the yoke forward
5	Extend boom Horizontal forward*	Extends the boom Moves the yoke Horizontal forward when linear
6	Retract boom Horizontal backward*	Retracts the boom Moves the yoke Horizontal backward when linear
7	Sideshift to the right	Moves the yoke and chassis to the right relative to the front wheels
8	Sideshift to the left	Moves the yoke and chassis to the left relative to the front wheels
9	Rotation clockwise**	Rotates the yoke clockwise
10	Rotation counter-clockwise**	Rotates the yoke counter-clockwise
11	Activate / deactivate linear motion* Hold both buttons	Activate / deactivate linear movement of the yoke
12	Restore position* Hold both buttons	Moves the yoke to the saved position
11+12	Save position* Hold both buttons	Saves the position of the yoke
13+14	Activate / deactivate vacuum Hold both buttons	Activate vacuum (hold both buttons 1 second) Deactivate vacuum (hold both buttons 4 second)

*Option

**Only RT models

10 Appendix

10.1 Terms and abbreviations

Term	Description
⚠ 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 safety
The machine	The entire basic machine unit and any equipment model
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	Description
HL	Highlifter
HLE	Highlifter Electric
RT	Rotation
SL	Smartlift
SLI	Smartlift Industry Machines without vacuum
WLL	Working Load Limit / Maximum lifting capacity

10.2 Declaration of conformity

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

CE

Morten Rosengreen
Head of Development
Smartlift A/S
N.A. Christensensvej 39
DK – 7900 Nykøbing Mors

Hereby declares that:

Model:

☐ SL 309 ☐ SL 309 RT

☐ SL 409 ☐ SL 409 HL ☐ SL 409 HLE ☐ SL 409 HLE RT

☐ SL 609 HL ☐ SL 609 HLE ☐ SL 609 HLE RT

☐ SLI 409 ☐ SLI 409 HLE

☐ SLI 609 HLE

Serial No.: _____

Date: _____ - _____ - 20_____

has been manufactured in accordance with the following EC directives:

Machinery Directive 2006/42EF

EMC Directive 2014/30/EU

The following standards have been used:

DS/EN ISO 12100 (Machine safety – General principles for design – Risk assessment and risk reduction)

DS/EN ISO 20607 (Machine safety – Instruction handbook – General drafting principles)

DS/EN ISO 14121-2 (Machine safety – Risk assessment - Part 2: Practical guidance and examples of methods)

Date:_____ **Signature:**_____

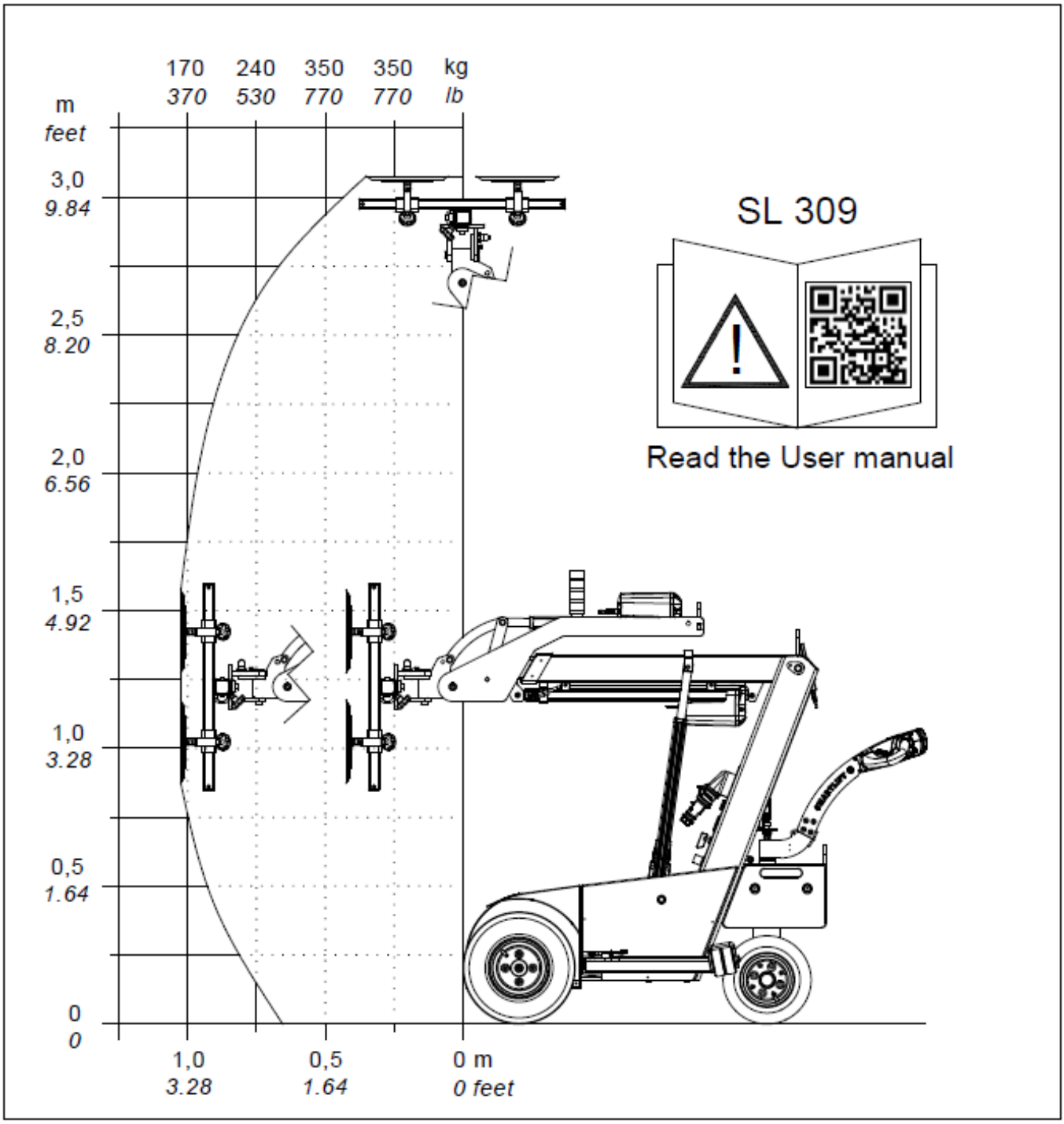
SMARTLIFT
N. A. Christensensvej 39, DK-7900 Nykøbing Mors
Tel. +45 9772 2911, E-mail: smart@smartlift.com

Nicolai Tange Jørgensen, CEO

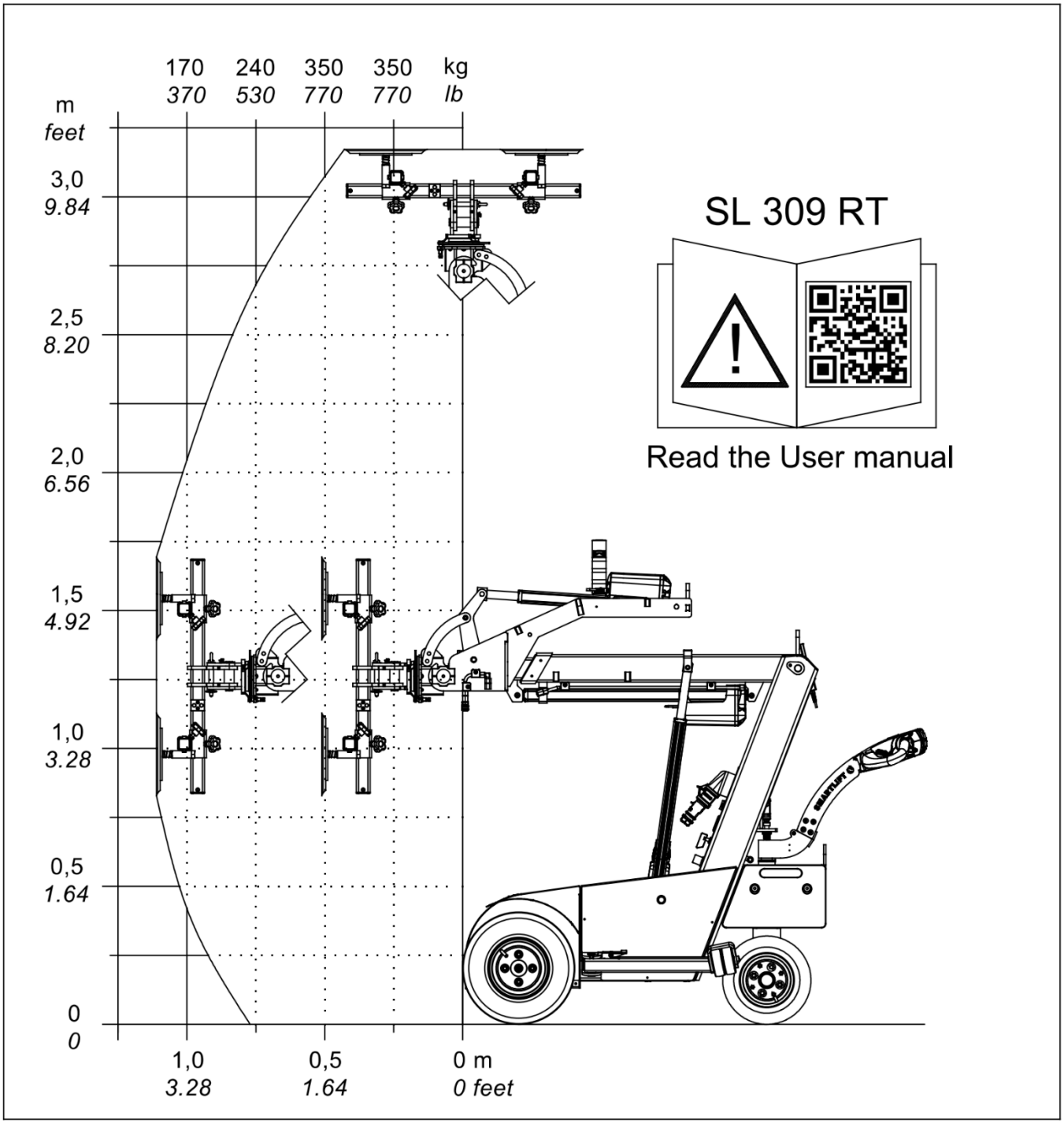
10.3 Load charts SL

Load charts only apply to machines with standard configurations.

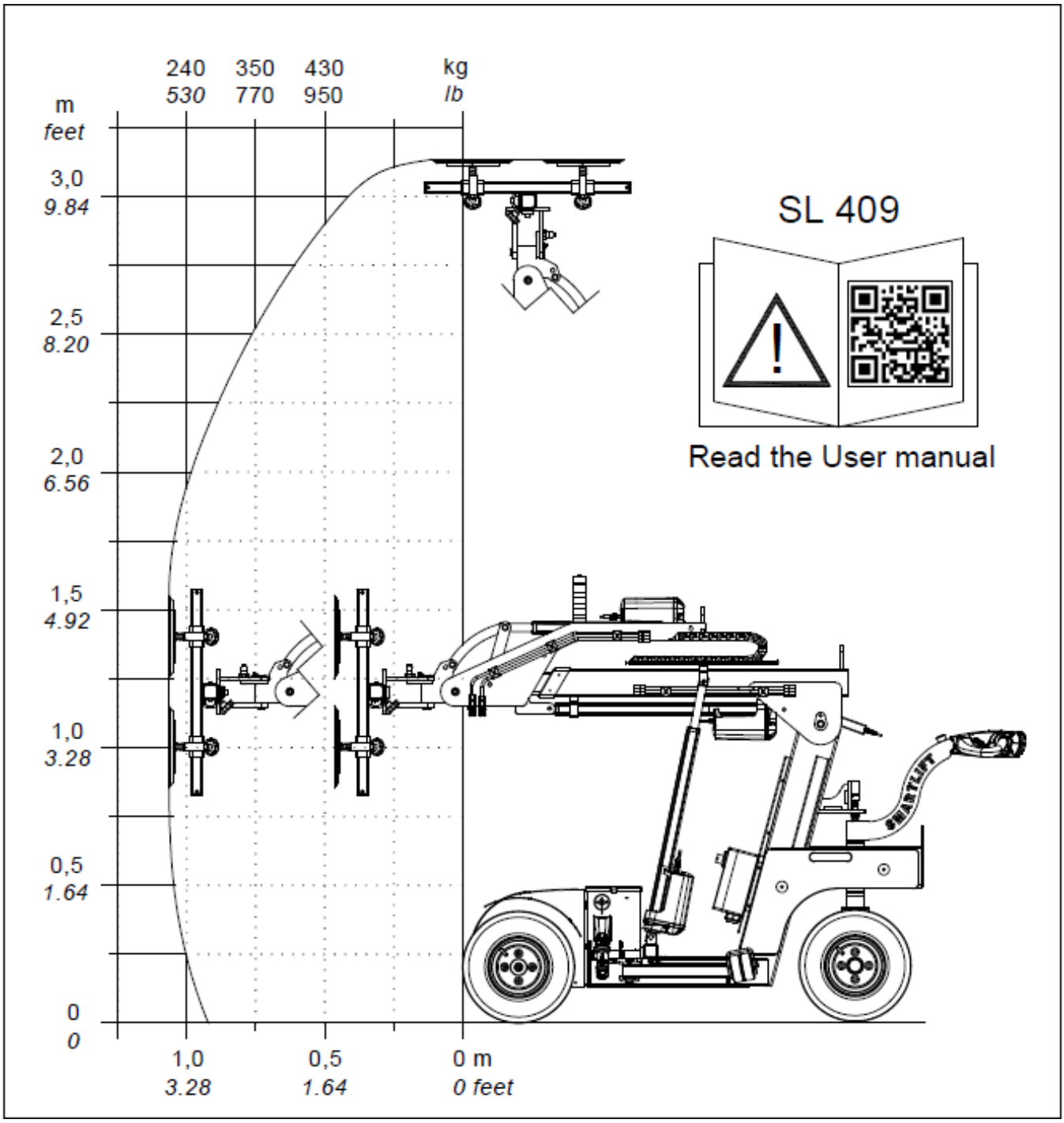
10.3.1 SL 309



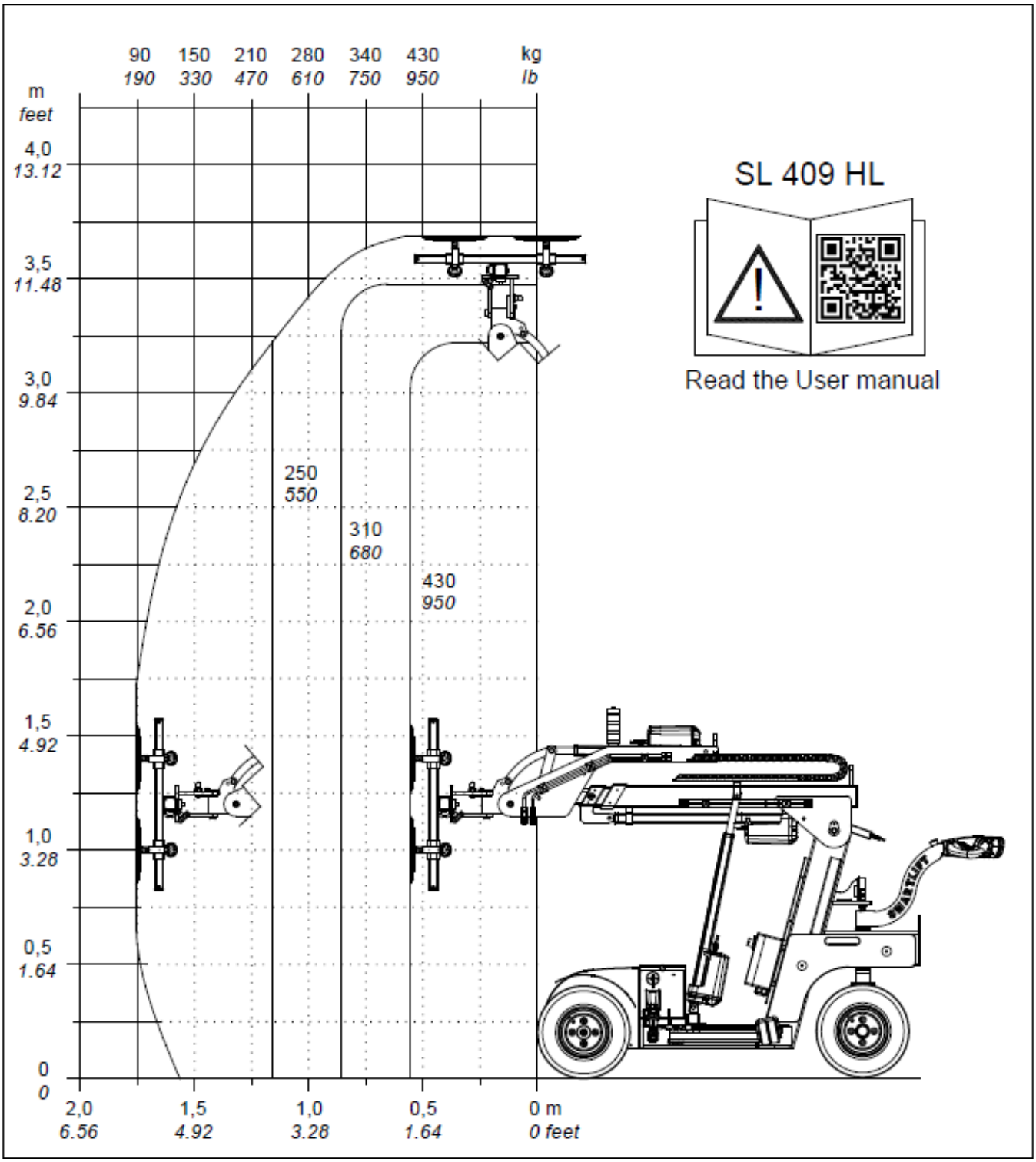
10.3.2 SL 309 RT



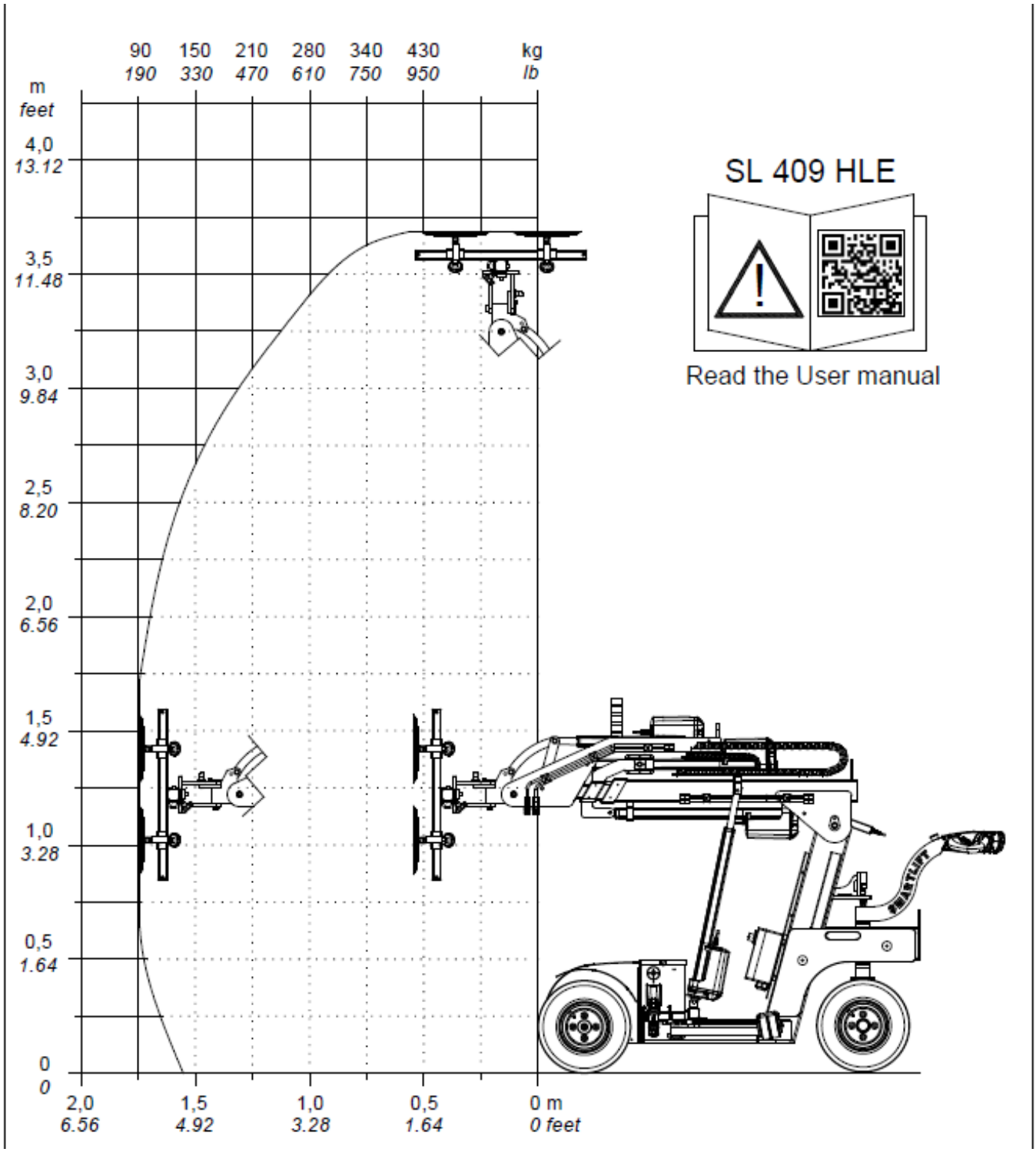
10.3.3 SL 409


240 350 430 kg
530 770 950 lb
m
feet
3,0
9.84
2,5
8.20
2,0
6.56
1,5
4.92
1,0
3.28
0,5
1.64
0
0
1,0
3.28
0,5
1.64
0 m
0 feet
SL 409
Read the User manual

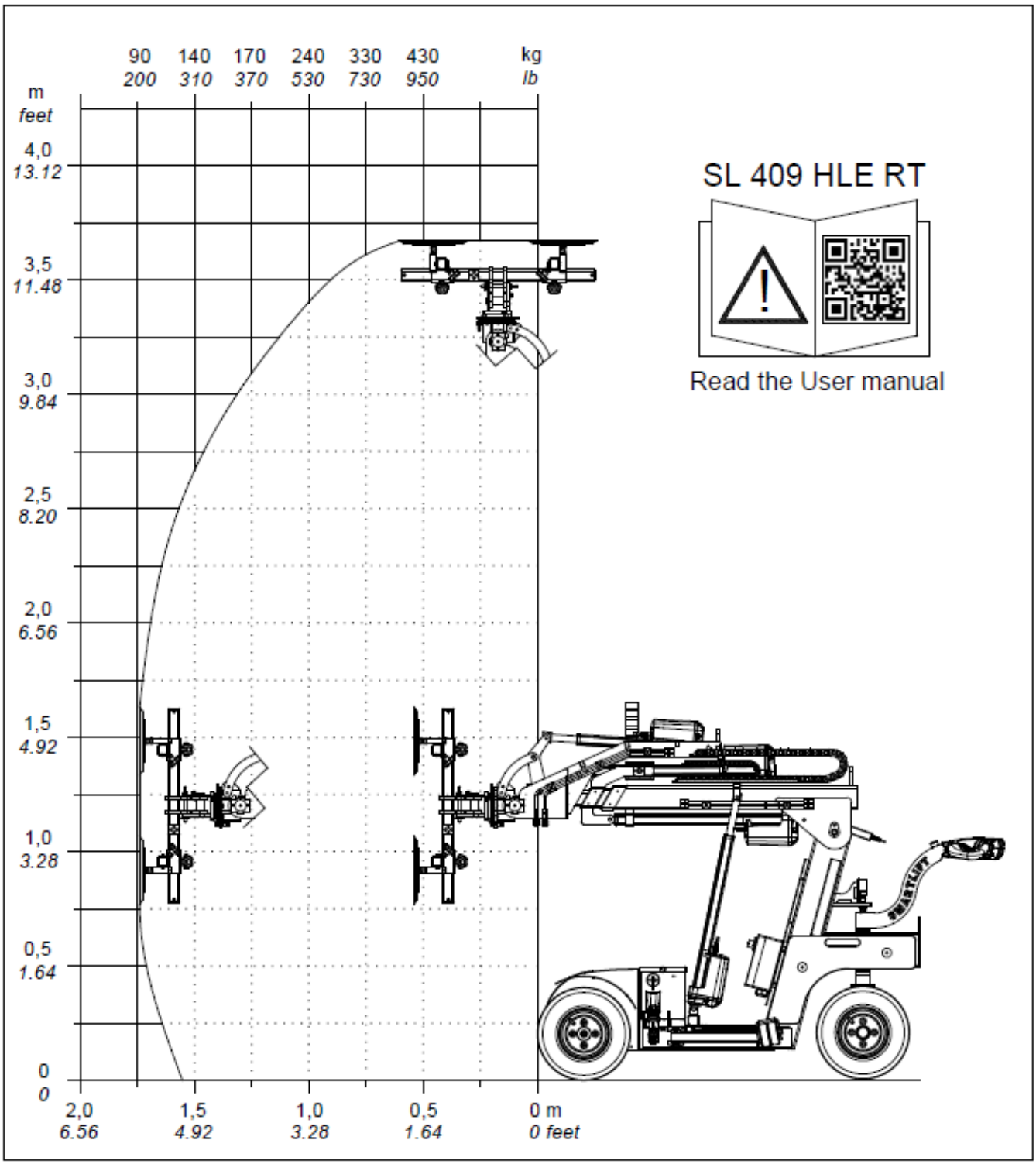
10.3.4 SL 409 HL



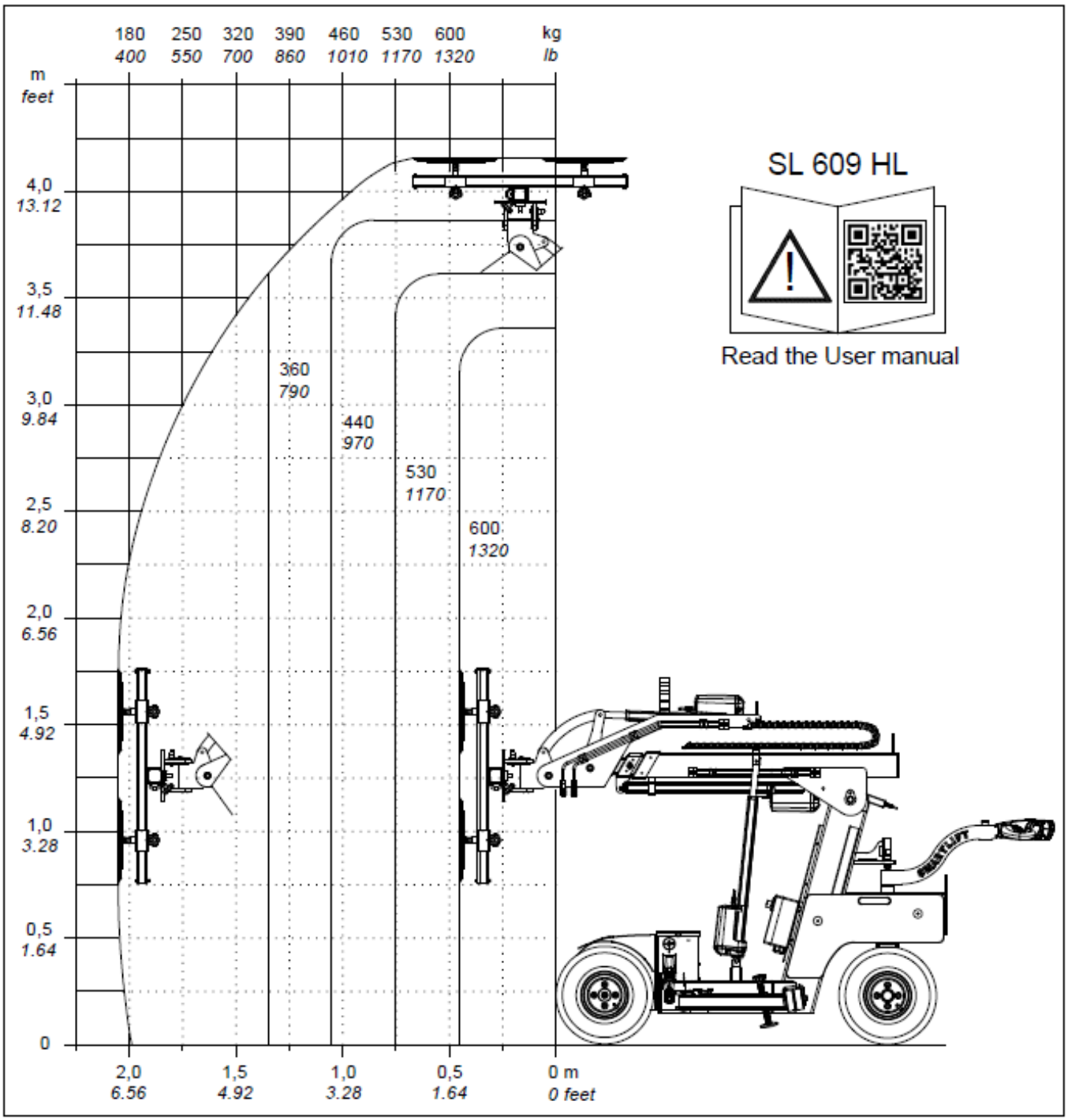
10.3.5 SL 409 HLE



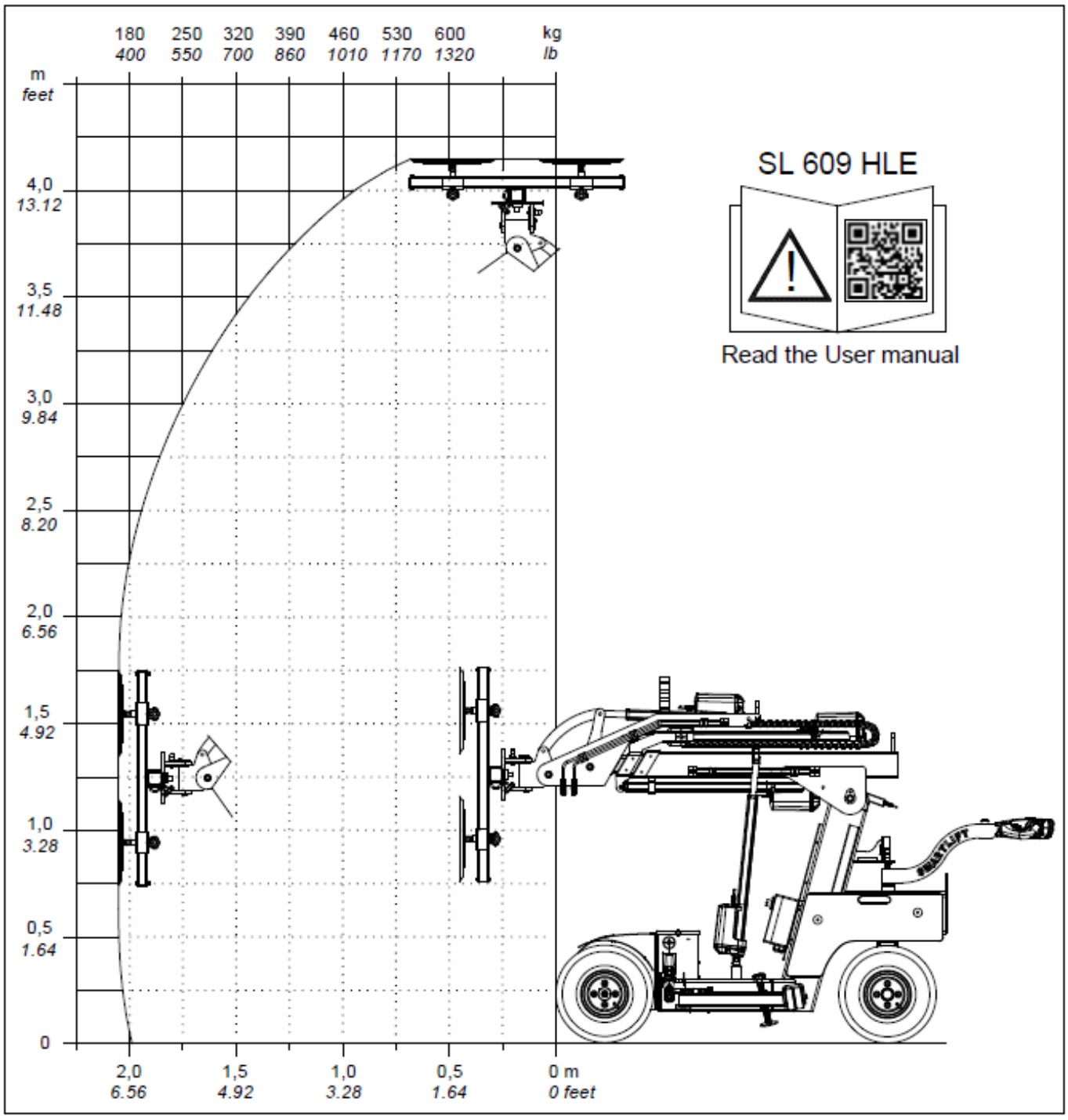
10.3.6 SL 409 HLE RT



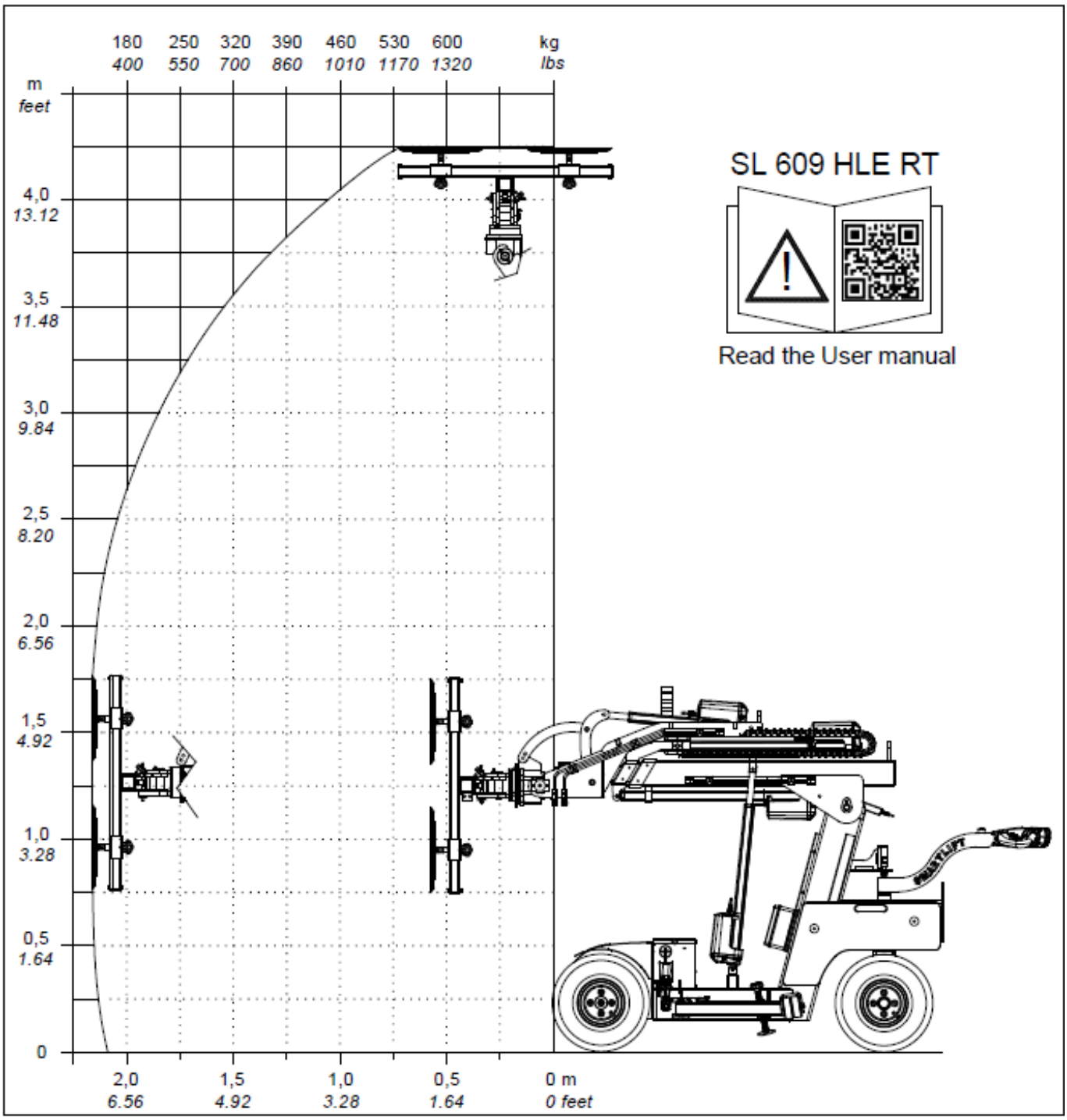
10.3.7 SL 609 HL



10.3.8 SL 609 HLE



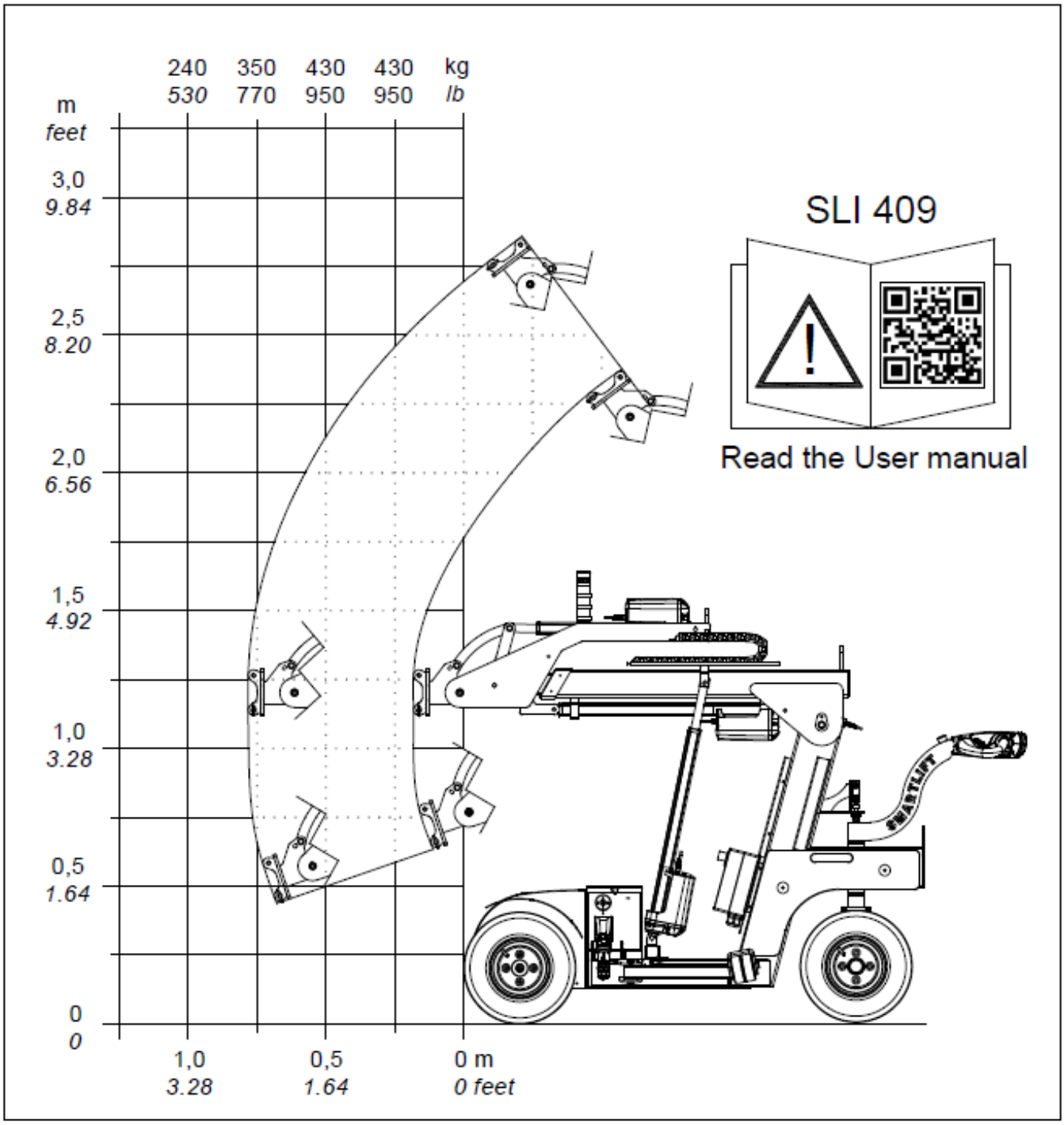
10.3.9 SL 609 HLE RT



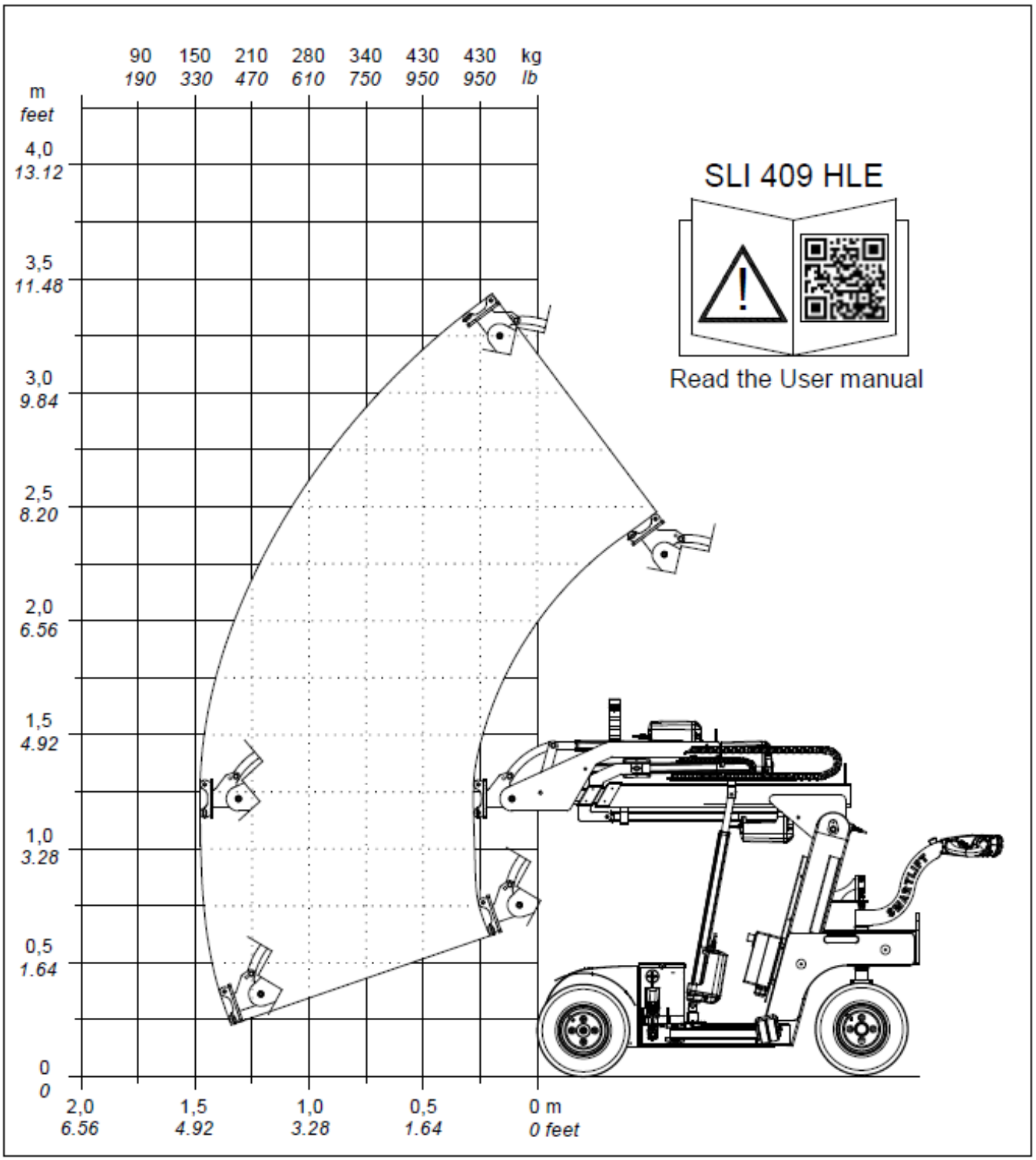
10.4 Load charts SLI

Load charts only apply to machines with standard configurations (Without tools).

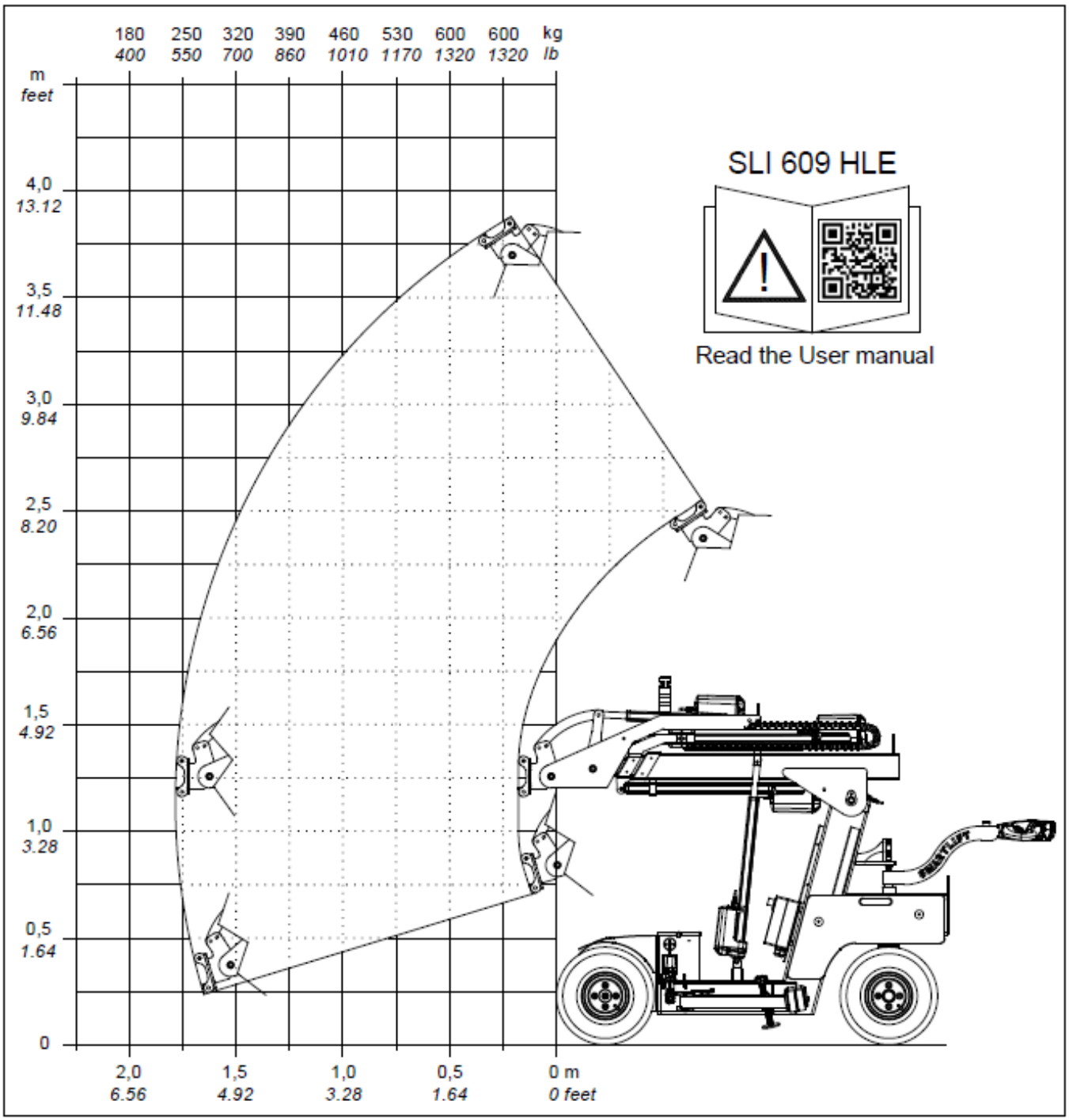
10.4.1 SLI 409



10.4.2 SLI 409 HLE



10.4.3 SLI 609 HLE



SMARTLIFT®

N.A. Christensensvej 39,
DK-7900 Nykøbing Mors
Tel.: +45 97 72 29 11

E-mail: smart@smartlift.com
www.smartlift.com