

CESAB S200 0.8 - 2.0 tonne

Powered Stacker trucks



PRODUCT GUIDE



This product guide applies to:

Model
S208L
S210
S212
P212L
S212S
S214
S214L
S220D

Document revision history:

Edition date	Changes
December 2010	New generation Stacker trucks

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Reading instructions

This product guide is designed as a point of reference. In some cases, information is available in two different chapters. This applies especially to the Sales arguments and Product details chapters describing the various features and benefits of the truck. To determine which chapter provides the desired information, please use the following content descriptions.

The various chapters of this product guide cover the following:

- **Product range information:** Provides a general overview of all truck versions in the series.
- **Applications:** This chapter describes typical customers and truck applications.
- **Product details:** This chapter offers detailed descriptions of truck features and truck components. It also includes a list of features and benefits.
- **Technical information:** This chapter presents capacity charts, load carriers, battery weights, x measurements, etc.
- **Options:** This is a list of truck options together with a description of their features and benefits.

Product range information

CESAB S200

The S200 range is a complete walkie stacker series for light to medium intensive applications. All trucks in this range are compact and easy to operate. They feature AC operation and driving characteristics can be programmed and adapted to individual operator preferences. This range is complemented by different battery sizes and a range of masts to choose from. The more powerful models, S212, S212L, S214, S214L and S220D, also offer battery change to the side.

Most versions are designed for handling of single, open-end pallets (Euro pallet), however, the S version is a straddle truck with support arms that enables handling of different pallets, while the D version can be used in double stacking applications. The L-version with elevating support arms can also be used for loading/unloading and for driving on uneven floors.

The CESAB model codes can be used as a guide for choosing the right model for the intended application:

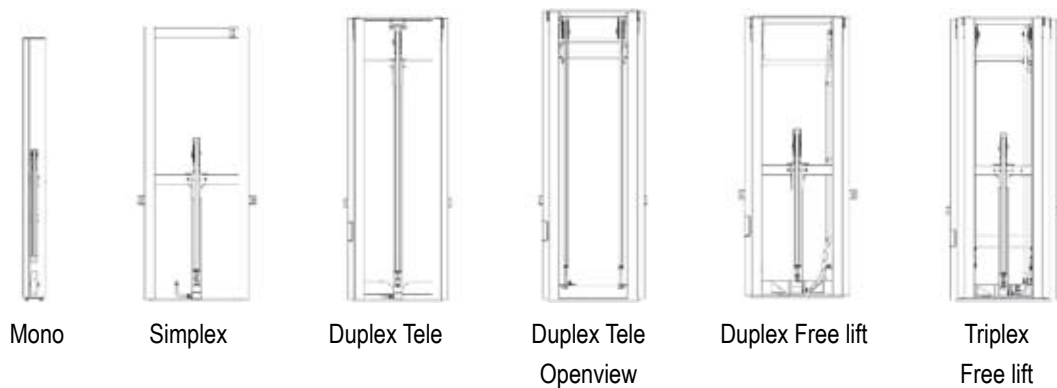
Truck type	Intensity class	Capacity	Feature
S = Stacker pallet truck	2 = Low to high intensity walkie applications	080 = 800 kg 100 = 1000 kg 120 = 1200 kg 140 = 1400 kg 200 = 2000 kg	L = Lifting support arms S = Straddle support arms D = Double stacking

The model code indicates rated truck capacity. Rated capacity indicates the load, which the model with standard configuration can lift to a height of at least 2.5 metres. The S220D is the only exception, where the rating instead indicates double stacking capacity. Double stacking refers to the total handling capacity of the truck, i.e. with one pallet on the forks and one on the support arm. The diagram below presents an overview of the models included in the S200 series.



The table below provides an overview of the lift heights and battery sizes available for the different truck versions in the S200 series.

	S208L	S210	S212	S212L	S212S	S214	S214L	S220D
Rated load (kg)	800	1000	1200	1200	1200	1400	1400	1000
Double stacking capacity, support arms + forks (kg)	-	-	-	-	-	-	-	1000+800
Support arm capacity (kg)	2000	-	-	1600	-	-	2000	2000
Chassis width (mm)	726	770	770	770	770	770/850	770/850	770
Battery compartment								
Small 150 Ah		X	-	-	-	-	-	-
Medium 225 Ah		X	X	X	X	X	X	X
Large 260/300 Ah		X	X	X	X	X	X	X
Large (sideways battery change) 260 Ah			X	X		X	X	X
180 Ah	X							
230 Ah	X							
Mast and max. lift height (mm)								
Mono	1580	-	-	-	-	-	-	-
Simplex	-	1700	1700	1700	1655	-	-	-
Duplex Tele	-	3300	4150	4150	4105	-	-	2100
Duplex Tele Openview		3300	4150	4150	4105	4105	4105	2100
Duplex Free lift	-	-	4150	4150	4105	4105	4105	-
Triplex Free lift	-	-	4500	4500	4755	4755	4755	-



S208L

- Mono mast with 600 mm and 1580 mm lift height.
- Chassis width 726 mm.
- Two battery sizes – 180 Ah and 230 Ah, but identical battery compartment length and width for both versions.
- Ideal for loading/unloading operations and to lift loads to a comfortable work height, e.g. on a shop floor. Can also be used for transport of loads up to 2,000 kg on the support arms.



S210

- Mast:
 - Simplex
 - Duplex Tele
 - Duplex Tele Openview with lift heights up to 3,300 mm.
- Chassis width 770 mm
- Three battery compartment sizes: small, medium and large that accept 150 Ah, 225 Ah and 300 Ah batteries.
- Primarily used for low-intensive stacking on even floors. Configured with the small battery compartment, the S210 is an ideal companion in confined areas.



S212

- Mast:
 - Simplex
 - Duplex Tele
 - Duplex Tele Openview
 - Duplex Free lift
 - Triplex Free lift with lift heights up to 4,500 mm.
- Chassis width 770 mm
- Three battery compartment versions: medium and large as well as large with sideways battery change. Accommodates 225 Ah, 300 Ah and 260 Ah batteries with battery change to the side.
- Primarily used for low and medium intensive stacking on even floors.



S214

- Mast:
 - Duplex Tele Openview
 - Duplex Free lift
 - Triplex Free lift masts with lift heights up to 4,755 mm.
- Chassis widths 770 mm and 850 mm.
- Three battery compartment versions: medium and large as well as large with sideways battery change. Accommodates 225 Ah, 300 Ah and 260 Ah batteries with battery change to the side.
- Primarily used for medium and high-intensive stacking on even floors. Configured with the 850 mm chassis, this truck is an excellent choice in applications requiring increased residual capacity.



S212S

- Mast:
 - Simplex
 - Duplex Tele
 - Duplex Tele Openview
 - Duplex Free lift
 - Triplex Free lift with lift heights up to 4755 mm.
- Chassis width 770 mm and support arm width 900, 1070, 1220, 1245 or 1300 mm.
- Two battery compartment versions: medium and large. Accepts 225 Ah and 300 Ah batteries.
- Thanks to the wide support arms that can be positioned on both sides of bottom-boarded pallets, this truck can stack open-ended pallets as well as other load carriers. The support arms are welded. Primarily used for low and medium intensive stacking on even floors.



S212L

- Mast:
 - Simplex
 - Duplex Tele
 - Duplex Tele Openview
 - Duplex Free lift
 - Triplex Free lift with lift heights up to 4,500 mm.
- Chassis width 770 mm
- Three battery compartment versions: medium and large as well as large with sideways battery change. Accommodates 225 Ah, 300 Ah and 260 Ah batteries with battery change to the side.
- Thanks to the elevating support arms, this truck can travel on uneven floors and ramps. It can also be used for horizontal transport of loads up to 1,600 kg on the support arms.



S214L

- Mast:
 - Duplex Tele Openview
 - Duplex Free lift
 - Triplex Free liftwith lift heights up to 4,755 mm.
- Chassis widths 770 mm and 850 mm.
- Three battery compartment versions: medium and large as well as large with sideways battery change. Accommodates 225 Ah, 300 Ah and 260 Ah batteries with battery change to the side.
- Thanks to the elevating support arms, this truck can travel on uneven floors and ramps. It can also be used for horizontal transport of loads up to 2,000 kg on the support arms. Configured with the 850 mm chassis, this truck is an excellent choice in applications requiring increased residual capacity.



S220D

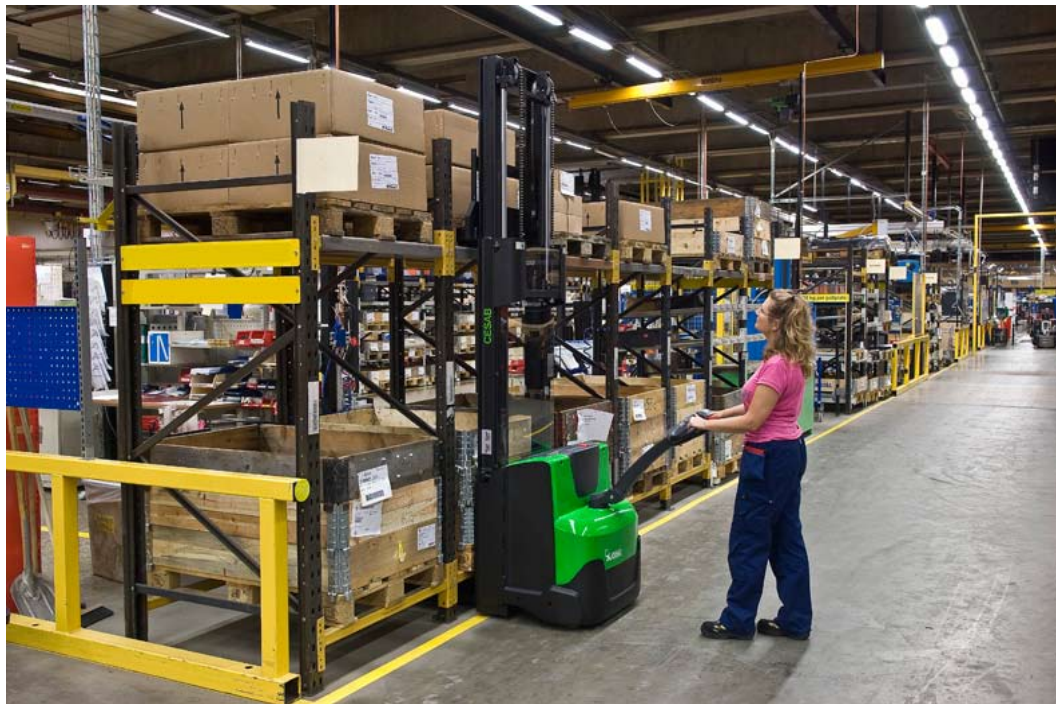
- Mast:
 - Duplex Tele
 - Duplex Tele Openviewwith lift heights up to 2,100 mm.
- Chassis width 770 mm
- Three battery compartment versions: medium and large as well as large with sideways battery change. Accommodates 225 Ah, 300 Ah and 260 Ah batteries with battery change to the side.
- Principally designed for double stacking operations, this is the only model in the S200 series that can handle two pallets simultaneously, 1200 + 800 kg (support arms+forks). Thanks to the elevating support arms, this truck can travel on uneven floors and ramps. It can also be used for horizontal transport of loads up to 2,000 kg on the support arms.



Applications

For low, medium and high intensive applications, there is always an S200 truck version that is optimised for the application no matter whether this involves loading/unloading of lorries, crossing ramps, travel on uneven floors, horizontal transport and/or stacking applications. Thanks to the high level of flexibility, the S200 truck range is an obvious choice for a number of typical customer segments. The trucks are used in small warehouses and various industrial applications, e.g. in shops and supermarkets. Common to most customers segments are medium transport distances of 5-50 m, lift heights of 2-4.8 m and load handling of 400-800 kg. Maximum lifting capacity is 800 – 1400 kg. For longer transport distances and enhanced operator comfort, all trucks except the S208L can be supplied with an optional operator platform. The trucks are designed for normal indoor use, i.e. with relatively even floors and temperatures that do not fall below 0°C. With optional cold store oil, the truck can be used in -35 degrees C.

Because of the varied customer segments, these trucks also must meet a number of different customer needs. With this in mind, the S200 trucks were developed for high performance and ease of use to also support staff whose work duties are not only limited to truck operation. Various customer segments and associated typical requirements are presented in the following.



Industry

In industrial applications, the S200 trucks can, among others, be used for stacking incoming goods in racking, as work tables or for supplying production lines with required material. Industrial applications require trucks with a high level of reliability. Goods must always be in the right place when needed. An increasing trend at many manufacturing companies is to reduce warehouse surfaces and intensify incoming deliveries. Although incoming deliveries may be frequent, usage intensity in these kinds of applications is lower compared to use in warehouses and distribution centres. However, frequently heavy goods need to be lifted and in many cases by inexperienced operators. For this type of application, several S200 truck versions can be used especially thanks to the high quality that guarantees that every truck in the S200 family is always available when needed. For heavy loads, the S214 versions constitute an excellent choice.



Warehouses/distribution centres

In warehouses and distribution centres, the S200 trucks can, for example, be used for stacking goods in racking, separating blocks of pallets and to load and unload lorries. In many a case, these trucks are also used for order picking or as a convenient work table, e.g. to price products. In warehouse applications, high productivity is key to success. Operators are usually adept at truck operation and expect a quick, flexible truck with sturdy design. This is exactly what the S200 trucks offer with the added possibility to adapt operator settings to individual experience. These trucks have minimal external dimensions and a reinforced chassis for heavy-duty applications in this kind of environment.

Shops/supermarkets

In shops and supermarkets, truck use usually is not that intensive, however operators want to use the trucks for many different applications, e.g. to unload goods from lorries, stack it on shelves and even to use the forks as a work table when placing products in the shop. Additionally, shops and supermarkets often have confined space and low door openings. The L versions with elevating support arms is an interesting truck option with impressive flexibility. When opting for the Free lift mast, the truck can pass through low door openings without compromising on the high lift heights.

In shops and supermarkets, the trucks are often operated by inexperienced staff, and they may even be left unattended on shop floors among customers and children. This environment requires an easy-to-use truck designed to prevent unauthorised use. The S200 trucks feature simple operation, and they have a programmable switch-off timer. If the operator leaves the truck unattended, it will switch off after the programmed time, from one minute to four hours.

Which truck for which application?

The following factors determine which model is suited for a given application:

- Lift heights and restrictions posed by door heights
- Type of stacking (racking, pallet blocks, etc.)
- Whether the truck will be used for loading/unloading lorries – quality of floors
- Capacity requirements at different lift heights
- Load carrier and load centre distance
- Usage intensity
- Travel distances
- Aisle widths.

It is also recommended to explore environmental requirements and future plans, for example to choose a truck that will not become obsolete when the company expands.

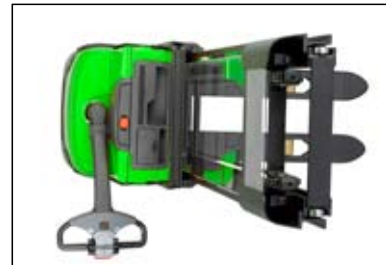
Sales arguments

These trucks are regarded as a tool. The intention is that both experienced and inexperienced operators should be able to use them. The following features make the S200 series trucks easy to operate:

Manoeuvrability

Feature

The S200 trucks has a 5-point wheel configuration, i.e. five wheels, and a centrally located tiller arm. The tiller arm length is optimised for excellent manoeuvrability.



Benefit

Central placement of the tiller arm has two benefits: The truck is easy to operate even by inexperienced operators, while the steering angle is the same in both directions enabling easy truck handling in confined areas.



The design with five wheels, with one in the centre, provides superior truck stability even when driving on ramps. Thanks to the length of the tiller arm, the operator has excellent control over truck movements.

Feature

The S200 trucks have an I_2 measurement starting from 680 mm. The I_2 measurement depends on the selected battery and mast. All corners are rounded.

Benefit

The trucks are compact and easy to manoeuvre in confined areas. Reduced risk that it will get caught by or knock into obstacles.



View

Feature

The S200 trucks offer a “Total View ” concept comprised of:

- Total view masts with optimized width.
- A compact truck with a sloping power unit
- Optimum distance to the truck with the operator sufficiently close to the truck for an unobstructed view.



Benefit

Excellent view through the mast and on the sides, which is appreciated when setting off goods in racking.

Excellent view with the forks at ground level because the operator is sufficiently close to the machine and has an unobstructed view through the mast and across the sloping power unit.



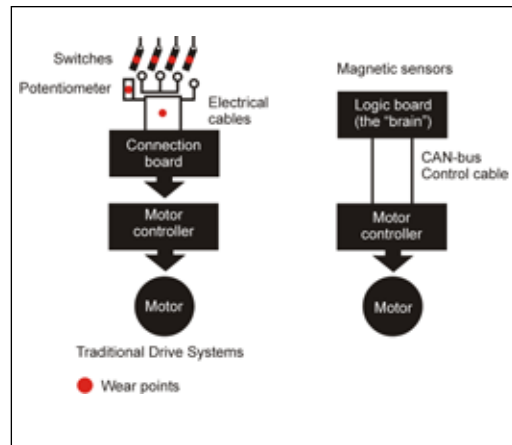
Control

Feature

The trucks are equipped with the CESAB drive control, offering quick acceleration and braking.

Benefit

Exemplary truck handling because the truck instantly reacts to operator commands.



Feature

All S200 versions, except the S210 and S208L, can be optionally fitted with stepless control of lifting/lowering, a smart, analogue control that allows stepless adjustment of the lifting and lowering speed.

For trucks not equipped with stepless control of lifting/lowering, the lifting and lowering movement can instead be used with the Creep speed feature. By making a really quick stop in the lifting/lowering movement and the continue lifting/lowering the lifting/lowering speed goes in to a creep mode. By clicking once more, Creep speed is deactivated. On the S208L and S210, Creep speed only operates with the lowering movement.



All S200 trucks feature an ergonomic handle with large, easy-to-reach controls and a clear, bright display.

Benefit

Lift and lowering movements are easy to control, enabling easy, uncomplicated positioning of pallets in racking. The trucks are easy to handle and can be operated with one or two hands. Information on truck status is available at a glance.

Operator safety

A safe truck prevents injuries and reduces costly damage to goods and the truck. The S200 series trucks come with a number of features that makes them safe in use.

Feature

The distance to the operator's feet is considerable and floor clearance is low (35 mm). The truck does not roll back unintentionally when starting on an inclination or ramp.



Benefit

The operator always has safe distance to the truck. This reduces the risk of foot injuries, while the low floor clearance provides added protection in case the operator should get too close to the truck. Since the truck does not roll backwards unintentionally when starting uphill, there is no risk it will run over the operator's feet.

Operational adaptable

Feature

Speed, acceleration, turtle speed and reversing characteristics can be programmed. The truck can store up to ten different operator settings.

Benefit

The truck can be easily adapted to individual operator experience or the intended application. This reduces the risk of accidents.



Increased uptime

An idle truck costs money. On one hand the truck must always be available when needed in order for business to continue as usual and remain efficient, while on the other hand service costs often represent a significant share of total truck costs during the truck's life cycle. To minimise the risk of an inoperative truck and resulting costly service outlays, the trucks in the S200 series have the following features:

Feature

On the S200 series trucks, a number of common problem sources that result in downtime have been eliminated thanks to improved truck design.

- All bushings are made from composite materials with Teflon coating to extend the service life and eliminate the need for lubrication.
- AC motor that does not move with the drive wheel – carbon-brushes that wear out and cables that twist have been eliminated.
- The cable connecting the tiller arm to the truck is a spiral shaped cable not affected by bending.
- To prevent entry of dirt, all terminals are insulated.
- No mechanical switches are used; all switches have a non-contact design in an effort to reduce the number of wear surfaces.
- Communication between the steering controls and motor controller relies on a CAN bus. This type of communication is common in the automotive sector and requires less use of cables in the exposed area between the tiller arm and motor controller.
- The lower part of the chassis has been reinforced to lessen the risk of impact damage on the truck.
- All hydraulic couplings are of quick connection type to almost completely eliminate the possibility of leaks.
- They are produced and developed in line with Toyota Production System, well known for its quality focus.



Benefit

By designing for durability to eliminate causes of trouble, the following has been achieved:

- Unscheduled downtime that causes business interruptions has been reduced.
- Unnecessary repair costs have been reduced.
- Truck service life has been extended.

Quick and easy service

Feature

In the design of the S200 trucks, a high level of serviceability was a key focus:

- The CAN connector is placed on the tiller arm.
- The display shows error codes.
- The cover is made of plastic and secured with two screws.
- The number of components has been considerably reduced.
- Fixtures are designed to enable use of standard tools.



Benefit

Downtime is reduced as a result of the following:

- When the truck does require service, this process is quick and efficient.
- Prior to his arrival on the site, the service technician can be informed about the existing error codes in the truck.
- Once on site, the CAN connector is easy to access and the cover can easily be removed.
- There are very few parts under the cover, thus enabling quick, easy access. Additionally, only few spare parts and tools are required, further speeding up the service process.



Product details

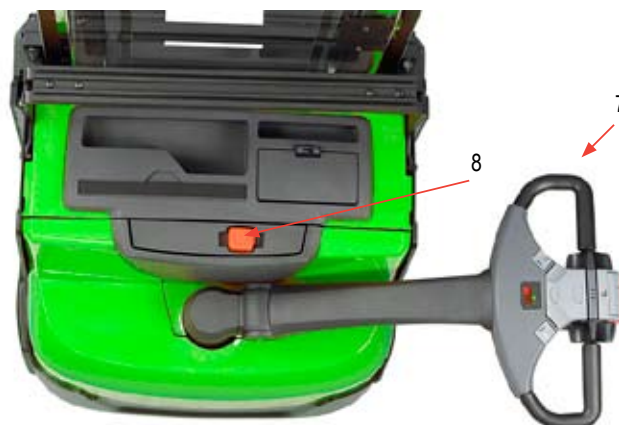
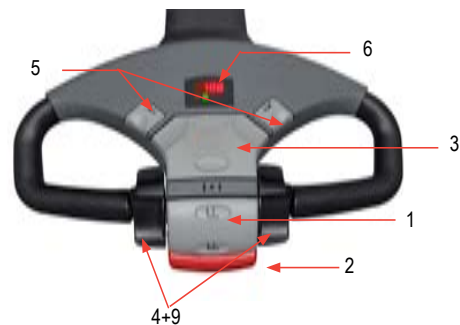
Operator environment

The S200 trucks are primarily designed for operators walking with the truck and not standing on a platform, however, an optional operator platform is available for all models except S208L

Tiller arm and controls

There are two versions of the tiller arm for the S200 series. One is designed for the walkie trucks while the other is designed for the platform truck with the operator riding onboard. Both versions use CESAB's ergonomic handles. On the S210 and the S208L the handle is slightly smaller than on the other versions. Main components and controls are located as follows:

1	Control for lifting and lowering
2	Switch for safety reversing
3	Control for lifting and lowering the support arms
4	Travel direction selector and speed control lever
5	Horn
6	Display
7	Tiller arm and brake
8	Emergency switch-off
9	Creep speed



Feature

All controls are within easy reach and not placed too close together. The truck and all truck operations can be operated with a single hand, left or right, as preferred.

**Benefit**

All controls are within immediate reach to reduce the risk of repetitive strain injury while opening up the possibility of productivity gains thanks to improved efficiency. Thanks to the one-hand operation concept, the truck can be easily operated in tight spaces.

In cold environments, the truck can also be operated with gloves.

Starting the truck

Feature

The steering handle can be fitted with two different start up systems.

- A keypad for switching on the truck using a PIN code. Up to 100 different PIN codes can be used to start the truck. It is possible to either open up blocks using preselected PIN codes, or user-defined blocks can be programmed with the help of a service technician. PIN codes are assigned to specific operators for individual setting of preferences. Up to ten different operator settings can be stored in the truck, while up to 10 different pin codes can be assigned to each operator setting.



It is possible to change the truck's start up system after delivery from the factory.

Benefit

Some companies prefer a physical key, especially in cases where external operators need to temporarily use the truck, while others prefer access via PIN codes that cannot be physically lost like keys.

Tiller arm

Feature

The S200 trucks feature a tiller arm optimised for manoeuvrability and optimum, safe distance to the operator's feet. It is centrally placed and mounted in a low position.

Benefit

Thanks to the long tiller arm, the operator is at a safe distance from the truck. The low mounting of the arm means the grip is at a comfortable height, which is especially appreciated by short persons. The central placement of the tiller arm makes operation of the truck extremely easy, even for inexperienced operators. Thanks to that the steering angle is exactly the same when turning in both directions it is also very easy to maneuver the truck in confined areas.



Feature

The maximum steering angle of the tiller arm is +/- 93 degrees.

Benefit

This extended range makes truck handling easy in cramped spaces.



Feature

When upright, the arm remains within the truck profile.

Benefit

The tiller arm does not require any space when left in the upright position, a clear advantage in very tight spaces.

Feature

The tiller arm features safety reversing. When the safety reversing switch is pushed when the truck is driven in the tiller arm direction, the truck stops and immediately reverses in the other direction. If the truck is in Creep speed mode, the safety reverse will only stop the truck and not reverse.

Benefit

Safety reversing prevents the operator from becoming pinched between the truck and a wall or other obstacle.

Feature

A spiral shaped cable connects in the lower part of the tiller arm.

Benefit

Thanks to the spiral shaped design, the cable is not bent, thus considerably reducing the risk of cable wear in a very exposed truck area.



Emergency switch-off

Feature

The truck has an emergency stop switch, placed at the highest point. When the emergency stop switch is pushed, the truck brakes and battery power is shut off. The emergency stop switch can be released by pulling it up.



Benefit

The emergency stop switch can be easily activated, e.g. to quickly switch off the truck in case of an accident or other emergency.

Display

The display shows battery status, total travel time and error messages. The display is also used to program operator parameters. Normally, battery capacity is displayed as a percentage (%), but can when needed be replaced by error codes or operator parameters.



Feature

The display provides the following information:

- A: Character display – when the power is switched on, the hour meter is displayed initially for a few seconds, while the hour counter indicator lights. After this, the battery capacity is displayed continually together with the battery indicator. If an error should occur, the error code indicator flashes in the display and an error code is shown in the character display.
- B: Hour counter indicator – when this symbol lights, the character display indicates total truck use in hours, i.e. the total operating time of the drive and/or pump motor.
- C: Parameter indicator – when the parameter control mode is selected (see the chapter on programming and operator settings), this indicator lights. The parameter list can then be verified in the display.
- D: Battery indicator – when this indicator lights, battery capacity is displayed as a percentage of full capacity. 100% equals a full charge. At < 10 %, the battery indicator starts blinking. If the battery indicator is allowed to reach 0%, the lift function is blocked to prevent overloading the battery.
- E: Error indicator – when this symbol flashes, an error code is displayed in the character display. Error codes are 4-digit codes. The first position shows in which function group the error has occurred. The second position indicates the severity of the error. The severity of the error uses these numbers: 0 = warning, 1–2 = serious error causing the truck to operate at creep speed with lifting/lowering operations blocked, 4–5 = critical error causing the truck to stop. The third and fourth positions are consecutive numbers describing which area is affected by the error. Whenever an error occurs, it is a good practice to first switch off the truck, disconnect the battery connector and then try to restart the truck. If the error remains after this action, a service technician should be contacted and the error remedied. The truck can store a total of 50 error codes.

Benefit

- The operator can quickly confirm whether something is wrong with the truck, and he can in some cases correct it by restarting the truck.
- If intervention by a service technician is required, he can be informed about what's wrong with the truck before arriving on site.
- It is easy to see when the truck needs charging.
- Thanks to lifting being blocked when the battery indicator shows zero, the risk of excessive battery discharge is reduced.

Battery covers and storage compartments

Two different types of battery covers are available, the standard ABS battery cover and a metal battery cover. The ABS covers are available with three different storage compartment designs depending on battery size and the metal covers are only available without storage compartments. The trucks have convenient storage compartments. Depending on the battery size, there are three different compartment designs.

Feature

The standard battery cover is made of a highly resistant and durable ABS material. The truck has a small, closed storage space, a paper holder and a larger storage compartment.



Benefit

The resistant design reduces downtime and reduces the need of unnecessary repairs. This enables the operator to bring along various items needed in his/her work. The closed compartment has the advantage that items will not fall out, e.g. when the battery cover is opened to charge the battery.

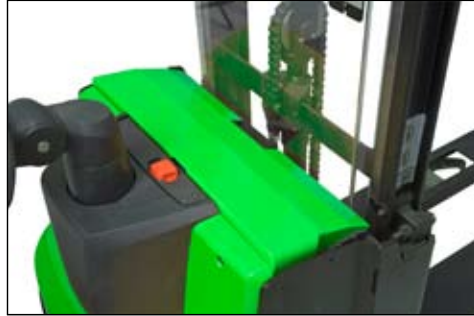
The metal battery cover is available for all S200 models except S208L and all battery compartment sizes; small, medium and large (both standard and sideways change). The cover has a smooth surface without storage compartments.

Feature

The battery cover is made of metal

Benefit

Robustness is further improved to withstand rough impacts.



Driving features/programming the truck

The S200 trucks are highly manoeuvrable and offer individual setting options for the operators. Settings that the operator can change himself are called operator parameters. The trucks also have a machine register in which settings only can be changed by a service technician. Please refer to the service manual for detailed information. Upon delivery from the factory, the trucks are preprogrammed with three different parameter settings. When switched on with PIN 1, the truck offers optimal parameter settings for this truck type, with PIN 2 it is switched on in a slower mode, and with PIN 3 truck characteristics are set to maximum performance. See all parameters in the parameter table.

Automatic back-up

All parameters are stored in the logic card and the motor controller.

Feature

Each time a parameter is changed, the system automatically backs up the data. This takes approx. 3-5 seconds during which time log-out is impossible. If, for example, the handle in which the logic card is housed needs to be replaced, then the service technician will be asked whether the parameters stored in the motor controller or the logic card should be stored in the new handle. If the technician in this case selects the motor controller, then all existing truck settings will be stored in the new handle.

Benefit

Whenever a component needs replacement, current settings will not be lost. Apart from the operator and service parameters, this also applies to the hour counters.

Operator parameters

To reprogram operator-specific parameters (if the change is permitted), proceed as follows:

- Press the horn button and keep it pressed while starting the truck using either PIN code entry or the ID unit.
- Release the horn button when the display shows “P”.

The parameter symbol on the display lights.

- Use the speed control to scroll to the desired parameter.
- Press the horn button once to change the value.

The parameter symbol on the display starts flashing.

- Change the value by turning the speed control.
- Confirm by pressing the horn button once more.

The parameter symbol on the display stops flashing and remains lit.

- Complete programming by pressing "O" (red key) on the keypad or the ID unit.

The table below lists available operator parameters.

Parameters for the factory settings, PIN 1-3

No.	Parameter type	Unit	Min./ Max.	Std. value	Slow values	Max. perf.	Notes
4	Acceleration	%	10–100	70	50	100	10: Slow acceleration 100: Fast acceleration In increments of 5
5	Automatic speed reduction power	%	10–100	90	90	100	Speed reduction when the speed control is released to neutral position 10: Slow speed reduction 100: Fast speed reduction In increments of 5
6	Top speed on	%	30–100	90	80	100	10: Lowest top speed setting 100: Highest top speed setting In increments of 5 There is a pre-set limit so that para- meter 7 never exceeds parameter 6.
7	Turtle button	%	30–100	50	50	50	Press the turtle button to reduce speed temporarily. The next time the button is pressed, the speed will revert to the normal parameter 6 value. The display alternately shows bat- tery status and SLO (slow). 10: Low speed 100: High speed In increments of 5

Feature

It is possible to adapt the settings for speed, acceleration and braking characteristics to the application, the operator's level of experience and/or preferences. The truck can store up to ten different settings.

Benefit

By adapting the truck to the operator and/or the application damage caused by inexperienced operators can be reduced while maximum productivity can be achieved with experienced operators.

Machine register and service parameters

It is possible to see machine-specific settings in this register, e.g. to confirm service parameters, however, it is not possible to make changes in the register. An example of service parameters are: service interval (time interval when the truck signals service is required), automatic switch-off, battery type settings (to achieve optimum battery discharge), and creep speed.

Proceed as follows to confirm settings in the operator and machine-specific register:

- Press the horn button and keep it pressed while starting the truck using PIN code entry.

The display then shows the various functions:

Operating hours and time remaining until next service (H)

Error codes (E)

Parameters (P)

Hardware and software version numbers (Pn)

- Release the horn button at the required display.
- To scroll between the settings for each mode, turn the speed control.

Automatic switch-off

For more information regarding automatic switch-off, see the Service manual.

Feature

A service technician can set the desired time interval for truck switch-off in case the truck is left unattended. This time can be set to either 4 h or in the range of 1-20 minutes in increments of one minute.

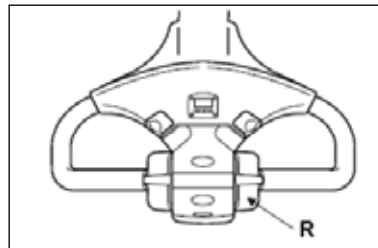


Benefit

The truck can be optimised for use in special settings. In surroundings with many people, the time can be set very short to ensure unauthorised persons cannot operate the truck when the operator sometimes need to leave it unattended to take care of other tasks, while in settings with no unauthorised people the time can be set to a longer interval to prevent the truck being switched off before the operator returns.

Creep speed

This feature switches truck travel to inching speed and permits truck travel with the tiller arm in the upright position. It is activated by quickly moving the travel direction selector (R) two times forwards or backwards. When this function is engaged, "SLO" blinks in the display. The function can be cancelled by once again quickly moving the travel direction selector (R) two times in either direction or by 10 seconds of inactivity.



The feature is also disabled if the safety reversing button is actuated. Inching speed is 1.7 km/h. A service technician can block this feature to prevent inching speed operation, however, by default the creep speed mode can be activated by the operator.

Feature

Creep speed enables truck travel at creep speed with the tiller arm in the upright position and without any need to push buttons.

Benefit

The truck can be manoeuvred in very confined areas. Because the function works without any need to push buttons, the operator has both hands free to steer the truck.

Brakes

During normal travel, the motor is used to brake the truck, however, it also has an electromechanical parking brake which is applied whenever the truck is not in use. The brake can be released by two screws. See service manual for more information.

Feature

When starting uphill or in an inclination, the forward travel mode can be selected without any risk of the truck rolling backwards when the brakes are released. In this case, the motor controller ensures the truck is kept stationary.



Benefit

It is always safe to start the trucks in inclinations. The operator does not risk having the truck roll over his feet.

Feature

When the tiller arm is in the upright position, the parking brake is applied. The arm automatically returns to upright position when it is released.

Benefit

The parking brake is applied as soon as the operator leaves the truck.



Feature

When the arm is pushed down, the parking brake is released.

Benefit

It is always easy to brake the truck.

Feature

When the speed control is released to the neutral position or when the travel direction changes, the motor brake is automatically applied. The amount of motor braking is programmable.

Benefit

This makes truck travel more gentle and reduces brake plate wear. For example, when handling fragile goods, braking can be set to extremely gentle.

Feature

During normal truck travel when the motor is used to brake the truck, energy is regenerated and returned to the battery every time the truck brakes. By converting kinetic energy this way, the motor is basically used as a generator.

Benefit

Regeneration of kinetic energy makes the truck more energy efficient.

Motor and power pack

The S200 trucks feature CESAB Drive control and use AC drive motors and DC pump motors. The reason for using a DC motor for pump operation is primarily to enable use of a less complicated motor controller compared with an AC motor.

Motor controller

All S200 models, except the S208L and S210, have a drive motor and pump motor with integrated motor controller.

Feature

Integrated motor controller – the same controller is used to control both the drive motor and pump motor.

Benefit

This enables reduction of the number of electric components and thus the risk of wear. Additionally, it introduces the possibility of controlling the motor revs.



Feature

Motor controllers with IP 65 classification.

Benefit

The high IP classification of the motor controllers means they are well protected against water and dust penetration.

AC drive motor

The size of the motor depends on the truck:

- The S208L, S210, S212 and S212S use 1.0 kW drive motors.
- The S212L, S214, S214L and S220D use 1.5 kW drive motors

Feature

The drive motor is fixed; it doesn't move when the drive wheel turns. However, as a result of suspension movement of the drive wheel, the motor can move slightly up and down.

Benefit

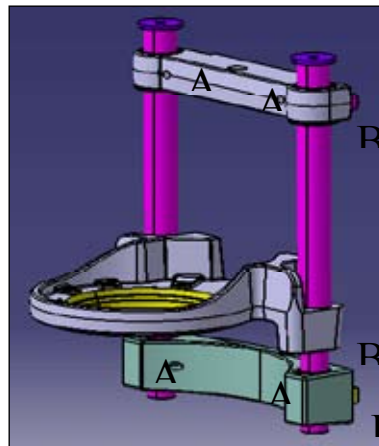
This reduces wear on cables and allows a compact truck design since the space usually used to allow cable twisting has been eliminated.

Benefit

The motor suspension has less wear surfaces. Compared to the predecessors, the number of wear surfaces has been reduced from eight to four.

Feature

Fewer wear surfaces reduces the need for service and maintenance. When service is needed, the procedure is simple thanks to easier access caused by the elimination of obstructing linkages on both sides. This solution also is a quality improvement measure since the risk of undesired play has been further minimised.



Feature

Gear box oil is synthetic with the following features:

- Excellent lubrication properties, even at cold temperatures.
- API GL-5 quality class rating – the oil is estimated to last for 10 000 usage hours.

Benefit

- Thanks to the excellent lubricating properties of the oil, energy loss is reduced improving overall energy consumption.
- Because the oil never needs to be replaced, the gearbox is maintenance-free.

Feature

Unlike a DC motor, an AC motor does not have any carbon brushes.

Benefit

Thanks to no use of carbon brushes that wear out, the service requirements have been reduced.

CESAB Drive control

The CESAB Drive control on the S200 series is a unique combination of contactless controls, CAN bus communication (CAN = Controller Area Network) and AC drive motor.

Feature

Contactless controls

Benefit

High reliability and reduced downtime thanks to the reduced number of moving parts and wear points.

Feature

CAN bus communication – digital communication between different system parts.

Benefit

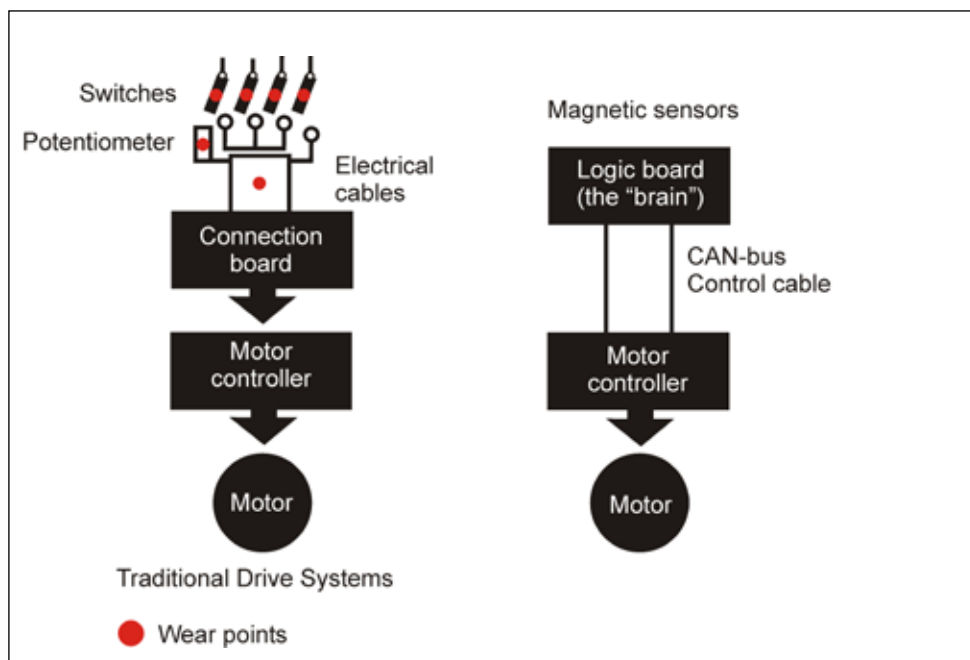
Provides quick, reliable information with few cables.

Feature

Thanks to CESAB Drive control, the trucks are easy to program (please refer to the programming chapter above).

Benefit

The truck can be adapted to the operator's level of experience and preferences, resulting in improved safety and increased production.



Drive wheel

The drive wheel diameter is 230 mm. The S200 truck models have two different drive wheel suspensions. A number of different materials is available, however, all materials cannot be chosen for every truck version.

Drive wheel material

The choice of drive wheel is a matter of balancing price and road holding characteristics. The S212, S212L, S214, S214L and S220D only offer Powerfriction. To meet braking standards and requirements on truck stability while at the same time ensuring the wheel can withstand the stress it is exposed to, a Powerfriction wheel is required on the larger models. S210 and S212S are available with Powerfriction or Topthane, while the S208L offer both of these materials and also Vulkollan and Vulkollan Quartz.

1. Vulkollan

Feature

Vulkollan is a hard-wearing wheel rated for very high loads. It is an ideal choice in heavy-duty applications.

Benefit

Clear benefits are the high loads it can handle and resistance to extreme wear. For trucks that travel long distances with heavy loads and considerable physical exposure, this wheel material is the best choice.

2. Topthane

Feature

This wheel is intended for normal load handling, and has a slightly lower friction coefficient compared to Powerfriction.

Benefit

Topthane wheels provide good grip and offer normal load handling characteristics at a lower price than Powerfriction wheels.

3. Powerfriction

Feature

All models can be ordered with Powerfriction drive wheels. This is a non-marking material with high friction coefficient.

Benefit

Powerfriction provides excellent grip, even on moist surfaces, and has superior wear characteristics. It does not leave marks on floors.

4. Vulkollan Quartz

Feature

This wheel has quartz sand mixed in the tread, causing a sand paper effect that results in slight wear on the surfaces on which the truck travels.

Benefit

Clear benefits are the high loads it can handle and resistance to extreme wear. Thanks largely to the sand in the tread, the wheel has an excellent grip, and this type of wheel is an obvious choice e.g in fishing wharfs and slaughterhouses.

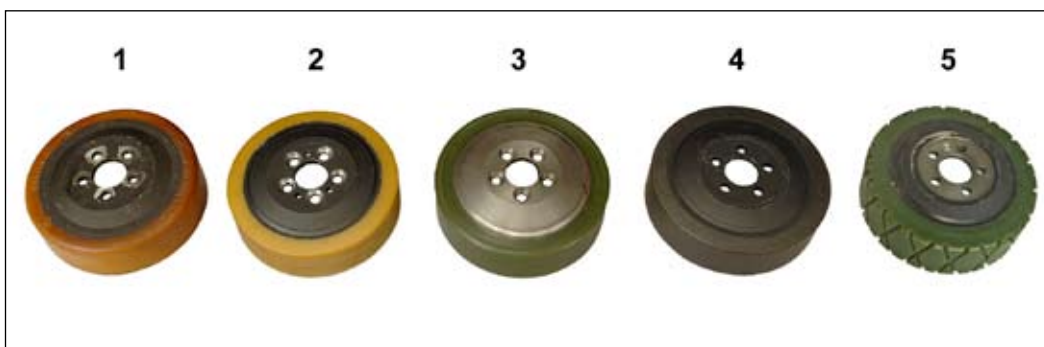
5. Treaded Powerfriction

Feature

Drive wheel for coldstore or wet environments.

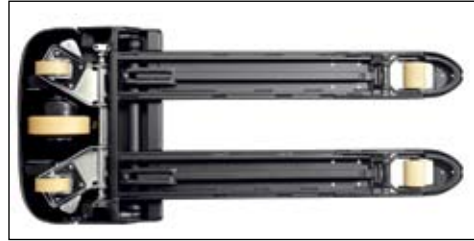
Benefit

Superior grip as tread pushes out the water and maximises contact to the floor.



Drive wheel suspension

On all truck models, except S208L and S212S with fixed drive wheel mounting, the drive wheel is suspended by a spring assembly. Depending on the truck configuration, four different kinds of spring systems are available. For details, please see the Technical information chapter.



Feature

The S200 stackers (except S212S) have a 5-point wheel configuration with the drive wheel in the centre. Thanks to the central placement of the drive wheel, the tiller arm is also centred.

Benefit

Because of the central placement of the drive wheel, the machine does not pitch when the wheel regains its grip after spinning, e.g. on wet floors and ramps. With a drive wheel placed off-centre, considerable lateral movement can occur in these situations. The central placement of the tiller arm makes it easier for inexperienced operators to handle the truck and ensures optimum view to both sides.



Feature

The drive wheel is placed closed to the compression-moulded frame.

Benefit

Thanks to the drive wheel placement and the contour of the lower part of the frame, the truck can easily travel across uneven surfaces and on ramps.

Feature

Suspended drive wheel

Benefit

Optimal drive wheel pressure, resulting in extended drive wheel service life and reduced steering power. In addition, this solution improves stability for high lifts since a considerable part of the lifted weight is distributed on the castor and fork wheels.

Electric components

A general design objective of the S200 series, was to use as few electric components and cables as possible, while remaining parts are optimally protected against dirt, humidity, impacts, etc.

Feature

MQS (Micro Quadlok System) terminals are used throughout. The MQS line is designed to withstand humidity and vibrations. The connector is completely sealed, while the electrical connection is mechanically secured in several ways. MQS terminals are used in the automotive sector by leading manufacturers with positive results.



Benefit

Communication is safe and reliable even in severe use.

Feature

Instead of plastic ties, cables run in cable ducts.

Benefit

This is a quality improvement since all machines are the same without any risk of plastic ties that abrade and wear out cables.

Feature

All contactors are cadmium-free. Cadmium is one of the most toxic heavy metals used in the manufacturing industry today. In humans, this substance primarily causes kidney damage, while in large amounts, it is poisonous to all forms of life.

Benefit

By refraining from use of cadmium, the environment is spared potential spreading of this toxic substance.

Cover

Feature

The cover is made of a highly resistant ABS material and is secured with only two screws.

Benefit

The cover is easy to remove and provides easy access to truck components. This simplifies and speeds up service interventions. The resistant design reduces downtime and eliminates the need for unnecessary repairs.



Chassis

The chassis widths on the different trucks in the S200 series are different. The chassis on all trucks is compression moulded and designed not to catch or knock into obstacles.

Feature

These are the available chassis widths for the various truck models:

- S208L: 726 mm
- S210, S212, S212L, S212S and S220D: 770 mm
- S214 and S214L: 770 and 850 mm

Benefit

Trucks are adapted to the intended application:

- The S208L, often used on lorry beds, similarly to a low-lifter has a narrow chassis for easy manoeuvrability in tight spaces.
- The S208L, S212, S212L, S212S, S220D and S214/L (narrow version), all have a chassis that is more narrow than the short side of a EUR pallet, making them nimble and easy-to-operate in confined areas.
- The S214 and S214L are available with a wide chassis offering high residual capacity during high lifts.

Feature

The castor wheels always swing inside the truck profile.

Benefit

This reduces the risk of foot injuries, while cutting down on damage to the wheels and goods. This is a clear advantage in the case of block stacking.



Feature

The lower part of the frame is compression-moulded.

Benefit

The moulding makes the truck more rigid while it absorbs impacts in an area where it is most needed, thus protecting the various truck functions.

Feature

Floor clearance, i.e. the distance between the floor and bumper, is 35 mm.

Benefit

This short distance protects the operator's feet from being run over by the truck wheels.



Feature

All corners are rounded.

Benefit

This provides excellent manoeuvrability in confined areas and reduces the risk of impact and the truck becoming caught in obstacles.

There is a rubber border is available for S208L. The trucks can be ordered with a rubber border instead of the standard steel border to allow high gradient ramp handling ability. The rubber border is especially suited for applications with high thresholds, curbs and ramps with high gradients. The rubber is strong enough not to compromise the foot protection but when driving over fixed obstacles like high thresholds or high gradient ramps the rubber border will bend.



Feature

A rubber border is available as an alternative to the standard steel border on S208L.

Benefit

The climbing ability of the truck is improved and it is possible to drive over high thresholds and high gradient ramps.



Castor wheels

The castor wheels have a width of 50 mm. On the S208L and S210, the available castor wheel materials are Vulkollan and Polyurethane. On all other truck models, Vulkollan is used as the castor wheel material. Depending on the application, the wheel suspension differs. Discounting the S212S that does not have castor wheels, two different suspension systems are used:

- Suspended castor wheel mounting.
- Fixed castor wheel mounting.

Feature

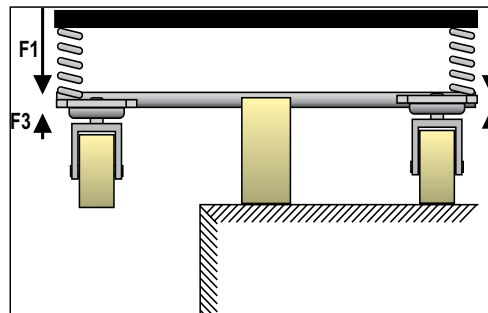
When the truck turns or passes a bump, pressure increases on one castor wheel as a result of compression of the spring. Thanks to the torsion tube, the other spring will compress by an identical amount.

Benefit

The truck remains stable and will never start to rock and travel like a 'walking duck', a classic phenomenon when spring forces do not interact.

Feature

When one castor wheel passes a hole or ends up outside a ramp, the torsion tube prevents the spring from extending more than the spring suspending the wheel resting on the surface.



Benefit

In an extreme case, when one castor wheel for example loses its footing outside a ramp edge, there is no risk the wheel suspension assembly will be knocked apart when the wheel regains its footing. This is because the wheel that has lost its footing and become unloaded remains at the same height as the wheel resting on the ramp/surface. With a conventional wheel design, this kind of situation often causes

damage to the castor wheel mount.

Fixed castor wheel mounting

Apart from the S208L with suspended castor wheel and S212S without castor wheels, all other models in the S200 series have fixed mounting of the castor wheels. This design could be realised thanks to the spring suspension of the drive wheel that enables the truck to travel across bumps.

Feature

Fixed mounting of castor wheels.

Benefit

At high lifts, the fixed mounting of the castor wheels provides additional lateral stability.

Castor wheels

Two wheel materials are available: Vulkollan and Polyurethane.

Feature

Vulkollan is a hard-wearing material with good physical properties. Polyurethane is a slightly cheaper alternative designed for less intensive applications. Polyurethane is an option for the S208L, S210 and S212S. Vulkollan can be selected on all models.

Benefit

For more intensive applications, the castor wheels are always in a wear-proof material that will last longer, while still offering the possibility of selecting a more economical option when required.

Feature

For precise positioning of the forks in pallets, e.g. in racking or other confined areas, the lifting/lowering speed can easily be reduced.

Benefit

This enables fine adjustment and simplifies positioning, reducing the risk of damage to racking and handled goods.



Lifting and lowering

The motor controller regulates lifting movement on all S200 models with the exception of S210 and S208L that use a contactor to control lifting. The contactor serves as a circuit breaker with only two positions, on and off. On trucks with a motor controller to regulate lifting, the motor revs can be controlled, which is why it is possible to outfit them with stepless control of lifting/lowering. However, because all trucks are not supplied with Stepless control of lifting/lowering, the Creep speed feature can be used instead to control lifting and lowering movement and this way control the speed even when stepless control of lifting/lowering is not available. On the S208L and S210, Creep speed only operates with the lowering movement. On all models, the lowering speed is controlled by a proportional valve monitored by the motor controller.

Pump motor

The pump motor design uses a 2.2 kW rated, series-wound DC motor on all truck versions, except S208L that uses a 1.4 kW compound motor.

Feature

The series-wound motor has a characteristics that gives high motor revs even with low load.

Benefit

Ensures high lifting speed also without load.

Feature

IP Class 54 on pump motor.

Benefit

A high IP Class protects against dust and water.



Stepless control with continuously adjustable lifting/lowering control

All models, except S208L and S210, can be optionally fitted with stepless control for the lift and lowering movement. Stepless control comes with an analogue control with continuous adjustment possibility.

Feature

The design with continuous adjustment enables highly precise control of pump motor revs and the proportional valve, which are used to control lifting and lowering movement.



Benefit

This enables gentle, precise positioning of load carrier with no recoil effect.

Feature

The continuous adjustment design of the control requires little effort to operate, while the control is easy to use with both hands.



Benefit

The operator can fully concentrate on the load and fork positioning.

Creep speed for lifting and lowering

Creep speed applied to lifting/lowering movement operates similarly to creep speed during truck travel. To activate the creep lift/lowering speed the operator just needs to make a quick stop in the lifting/lowering movement and then continue. The actual speed used during low-speed operation can be programmed by a service technician. To disengage the mode, simply click the control once more. This feature is available on all models, however on the S210 and S208L it only controls lowering movement, while trucks fitted with stepless control completely lack this feature, since there's no need for it if you can control the lifting/lowering speed steplessly. If required, Creep speed of lifting/lowering movement can be disabled by a service technician.

Switch

For Duplex Tele, Duplex Tele Openview, Duplex Free lift and Triplex Free lift masts all models with elevating support arms, except the double stacker, have a switch positioned at a lift height of between 1300 mm and 2200 mm, depending on mast configuration.

Feature

When the forks reach the switch position, the following occurs:

- If it is a truck with elevating support arms the lifting movement will stop at the switch height if the support arms are not in their lowered position. If the operator tries to continue to lift the forks the support arms will instead be lowered until they are in their bottom position, then the lifting movement of the forks continue.
- The travel speed is reduced to 5 km/h.

Benefit

The operator need not remember whether the support arms are in the raised or lowered position. This consistently assures maximum stability at high lift heights.

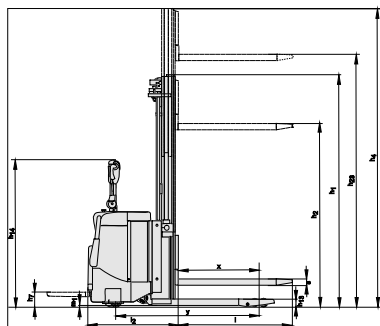
Mast

A number of different mast choices are available for the S200 trucks:

- Mono mast (only S208L)
- Simplex
- Duplex Tele
- Duplex Tele Openview
- Duplex Free lift
- Triplex Free lift

Masts are replaceable and fit different truck versions, however, please note that usually the drive wheel suspension needs to be replaced if a different mast is installed. If this is neglected, drive wheel pressure could be incorrect, endangering truck safety because the standard braking requirements cannot be guaranteed. For more information on the required drive wheel pressure, please refer to the Technical information chapter. Also the machine and rating plates must be replaced.

When selecting a mast, it is important to ensure the truck meets the requirements on both permitted lift height and max. permitted mast height. The maximum permitted mast height is affected e.g. by the height of existing doors and gates at the site. To determine available masts for a given truck, the dimensions below are important:



h_4

h_{23}

h_1

h_2

important:

h_1 = Height of mast, minimum

h_2 = Free lift

h_{23} = Total lift height

h_4 = Height of mast, maximum

A decisive difference between the different masts is the possibility of free-lifting. See the picture below that depicts the differences between the Duplex Tele, Duplex Free lift and Triplex Free lift masts. :



Mono mast

A centrally positioned mast with the chain inside the truck profile. It is suitable for low lift heights where the operator often works close to the truck, e.g. when using it as a work table. Only available on the S208L.

Feature

The mono mast has a closed profile, i.e. the chain runs inside the mast profile.

Benefit

It is easy to move around the mast with a very small risk of crushing injuries.



Simplex

The Simplex mast relies on a single frame. Available on till S210, S212, S212L and S212S.

Feature

The forks travel inside the frame profile.

Benefit

Maximum mast height remains the same even during lifting. A simple solution that suits applications not requiring high lift heights.

Duplex Tele

This mast uses two sections and a centrally located cylinder. Available on S210, S212, S212L, S212S and S220D.

Feature

The Duplex Tele mast has a free-lift range of 76 mm.

Benefit

Because the pallet can be lifted from the floor, it is possible to transport goods horizontally without raising the mast and increasing its minimum height. Especially useful if the site has low ceiling clearance or doorways.



Duplex Tele Openview

This mast uses two mast sections with two cylinders positioned along the sides. Available on S210, S212, S212L, S212S, S214, S214L and S220D. For the S220D there are some limitations: the two low masts (Lh 1700 and 1900 mm) with free-view option can only be selected in combination with the sideways battery change option. The Openview mast with Lh 2100 mm can be ordered with any battery size, but the battery hood needs to be removed to change the battery.

Feature

The Duplex Tele Openview masts are designed with two chains and cylinders placed far apart on the sides.

Benefit

This optimises operator visibility, while rendering fork positioning safe and easy.



Feature

The Duplex Tele Openview masts offer a free-lift range of 76 mm.

Benefit

This enables horizontal transport of goods without raising the mast and increasing its minimum height. Especially useful if the site has low ceiling clearance or doorways.

Duplex Free lift

A two-section mast with maximum free-lift range. Available on S212, S212L, S212S, S214 and S214L.

Feature

The minimum height of the mast only starts to increase when the back of the fork carriage reaches the top of the inner mast section. This means that masts with a higher lift height also have a higher free-lift.



Benefit

The Duplex Free lift mast combines high lift heights with a low mast height. As such, the Free lift mast is suitable for stacking applications in halls with limited ceiling heights, on covered lorries and where the truck must pass through doorways with low clearance.

Feature

Only one centrally placed cylinder and two smaller ones on the sides.

Benefit

Excellent view through the mast.

Triplex Free lift

A three-section mast with maximum free-lift range. Available on S212, S212S, S212L, S214 and S214L.

Feature

The minimum height of the mast only starts to increase when the back of the fork carriage reaches the top of the inner mast section. This means that masts with a higher lift height also have a higher free-lift.



Benefit

The Triplex Free lift mast combines very high lift heights with a very low mast height. Because of this, the Triplex Free lift mast is well suited for stacking applications in halls with limited ceiling heights and operation on covered lorries.

Common features

Feature

These trucks rely on a modular design concept. All masts can be used on all truck versions, but make sure that the drive wheel pressure is correct. There are some exceptions; the mono mast for S208L and the Duplex tele mast for S210. The mono mast can only be used on S208L and the Duplex tele mast for S210 can only be used on machines without elevating support legs.

Benefit

All masts are exchangeable with each other. A clear advantage in rental applications and for long-term service contracts. On one hand, fewer spare parts need to be held in stock, while on the other it is easy to adapt the trucks to specific customer applications.



Feature

Instead of being permanently welded, the masts are mounted with four bolts, except S208L that uses only two bolts.

Benefit

Disassembly of truck and mast is easy, saving time during service interventions.

Feature

Two types of finger guards are available: Plexiglas or grating, however not with mono mast.

Benefit

Freedom in choosing an ideal solution. Plexiglas provides optimal view in environments without reflecting light and where dirt can adhere to the glass surface. In grimy or cold environments, grating is a better solution.

Feature

All hydraulic connectors are quick connectors that do not require screwing action for connection, but can instead be snapped on.

Benefit

Hydraulic quick connectors reduce the risk of leakage and enable quick, easy hose changes. Additionally, they contribute to the compact truck design since space for tools can be eliminated.

Feature

Roller at top and bottom of mast girder, however not on S210 and S208L.

Benefit

Minimised risk of play.

Feature

The rollers are angled without any side guides.

Benefit

The rollers cannot seize, this way reducing wear on the girder.



Feature

Sealed bearing in rollers.

Benefit

Extended service life since wear cannot penetrate bearings. No need for lubrication.

Fork carriage

All bushings and axles used on the fork carriage have a new design. This chapter describes these parts together with the forks and fork wheels.

Forks and support arms

The fork thickness has been standardised to 60 mm on all models, except the S214 and S214L that have 70 mm thick forks to manage heavier loads. The fork width is 180 mm. A wide range of fork configurations with different lengths and widths over forks is available as indicated in the table below. Please note that fork configuration affects residual capacity. For more information, please refer to the capacity charts under Technical information. An FEM 2A fork carriage is used on the S version.

Only the D version has different support arm lengths. This truck is adapted for holding loads also on the support arms. The support arm length always depends on the selected fork length.

The support arms for S212S comes in five widths, 900, 1070, 1220, 1245 or 1300 mm. They are not adjustable.

Feature

Possible fork configurations in terms of length and width over forks (fork length * WOF , Width Over Forks in mm):

Model	Fork configuration, stackers, mm	
S208L	Fork length	1150/1200
	Width over forks	536/550/570/685
S210	Fork length	1000/1150 and 1100 -1800 in steps of 100 mm
	Width over forks	536/570/685
S212	Fork length	1000/1150 and 1100-1800 in steps of 100 mm
	Width over forks	536/570/685
S212L	Fork length	1000/1150
	Width over forks	536/570
S212S	Fork length	1150/1250
	Width over forks	252-800
S214	Fork length	1000/1150 and 1100 -1800 in steps of 100 mm
	Width over forks	536/570/685
S214L	Fork length	1000/1150
	Width over forks	536/570
S220D	Fork length	1150/1200
	Width over forks	536/570

Benefit

The truck can be adapted to handle different load carriers. These are examples of recommended configurations for some of the most common pallets:

- EUR pallet - 570 x 1150 mm forks.
- CHEP pallets - 685 x 1000 mm forks.
- Quarter pallets - 536 x 1150 mm forks.

Feature

Reinforced fork mounting.

Benefit

The reinforced mounting increases fork durability and reduces the risk of cracks in the fork.

Axles and bushings

Because bushings and axles are highly vulnerable parts, new high-quality materials have been developed for the S200 and P200 truck series. The results from truck life cycle tests have been very positive.

Feature

The bushings are made from Teflon-coated composite material.

Benefit

Teflon-coated composite bushings offer extended length of service and do not require lubrication.

Feature

The axles are hardened.

Benefit

This design enables them to withstand any kind of environment and interact optimally with the bushings.

Fork wheels

The fork wheel diameter is 85 mm with two different versions, single wheel or bogie wheel. S220D is an exception and is only offered with bogie wheels.

Feature

The single wheel design relies on one wheel in each fork.



Benefit

The single wheel provides good manoeuvrability and facilitates easy positioning of the forks during long side handling of EUR pallets or handling closed pallets.

Feature

The bogie wheel design features two wheels in each fork.

Benefit

Bogie wheels can more easily climb over uneven surfaces and they can manage heavy loads.

Battery compartments, batteries and charging

When selecting the battery, these aspects should be considered:

- Physical limitations of the battery compartment – information on battery compartment sizes is available in the Technical information chapter.
- Minimum and maximum weight – these weights are indicated in the Technical information chapter. Especially for stackers, the minimum permitted weight is important since it affects truck stability.
- Intended truck application – for low intensity operations, a smaller battery should be chosen, while for higher intensity operations, a larger battery is required.

To obtain maximum usefulness from the battery, it is important to select a charger optimised for the battery and the intended application.

Battery compartment

There are three different battery compartment types:

- The standard compartment with vertical battery replacement. This compartment is available in three sizes: small, medium and large.
- A compartment with sideways battery replacement, relying on rollers at the bottom of the battery compartment. It is only available for the large battery. The height to the rollers is 215 mm.
- A unique battery compartment on the S208L to accommodate a two-piece battery with vertical battery change.



For more information on dimensions and compartment sizes for the various trucks models, please refer to the Technical information chapter and the initial chapter in this guide.

Feature

Selection of different battery compartment sizes is possible (not applicable to S208L). For the larger truck models, battery change to the side is also a possible option (from S212 and up).

Benefit

The truck can be optimised for the intended application. For high-intensive applications, sideways battery replacement is a recommended option.



Feature

All S200-models have a sloping power unit.

Benefit

This way, the operator has an excellent view in the fork direction.



Battery types

Two types of batteries can be used to power the S200 series trucks: Freely ventilated batteries (lead-acid) available in all sizes, and ventilated batteries (GEL batteries). The available valve-regulated batteries are manufactured by Hawker (GEL Evolution) and in medium and large size.

Feature

The customer can choose between different battery types

- Freely ventilated batteries – provide high energy capacity, require maintenance by replenishing water, generate oxy-hydrogen gas during charging, have lower price compared to valve-regulated batteries.
- Valve-regulated batteries – have lower energy capacity compared to freely ventilated batteries, are more expensive, do not require water replenishment, present no risk of leaking electrolyte, generate almost no oxy-hydrogen gas during charging, require a regulated charger (see the chapter on chargers).

Benefit

The customer can choose the battery that is best suited for the application.

- In case the customer puts priority on high energy capacity at a low price, then freely ventilated batteries is the obvious choice.
- If the customer instead wants a battery that does not require special charging rooms and maintenance, the valve-regulated batteries can be recommended.

Battery connector and charging

To charge the battery, disconnect the battery connector and connect it to the battery charger. The battery connector should also be disconnected in the following situations to cut the power supply:

- In the event of an accident.
- In connection with welding work.
- If the truck will not be used for 3 days.



It is a 80 A battery connector. For further instructions on maintenance of the battery and charger as well as change of battery, see Technical information.

Chargers

A wide choice of battery chargers is available on the market. These chargers can largely be divided into two types: Conventional transformer chargers, typically unregulated, and High Frequency (HF) chargers with regulated operation and thus a possibility to control the charging process.

The charger must be adapted to the battery. If GEL batteries are used, a regulated charger suited for GEL battery charging must be used. Additionally, for uninterrupted battery warranty cover, battery manufacturers require that a charger approved by them is used. Lead-acid batteries are not as sensitive in terms of charger selection.

Feature

Different types of chargers provide different characteristics:

- Conventional, unregulated chargers are sensitive to line voltage fluctuations. As a result, the charging duration can vary, however, these chargers are cost-effective.
- HF chargers are not as sensitive to fluctuations in the line voltage, and they are able to carefully control the charging process and as a result the charging duration.

Benefit

The choice of charger best suited for the intended application depends on the following:

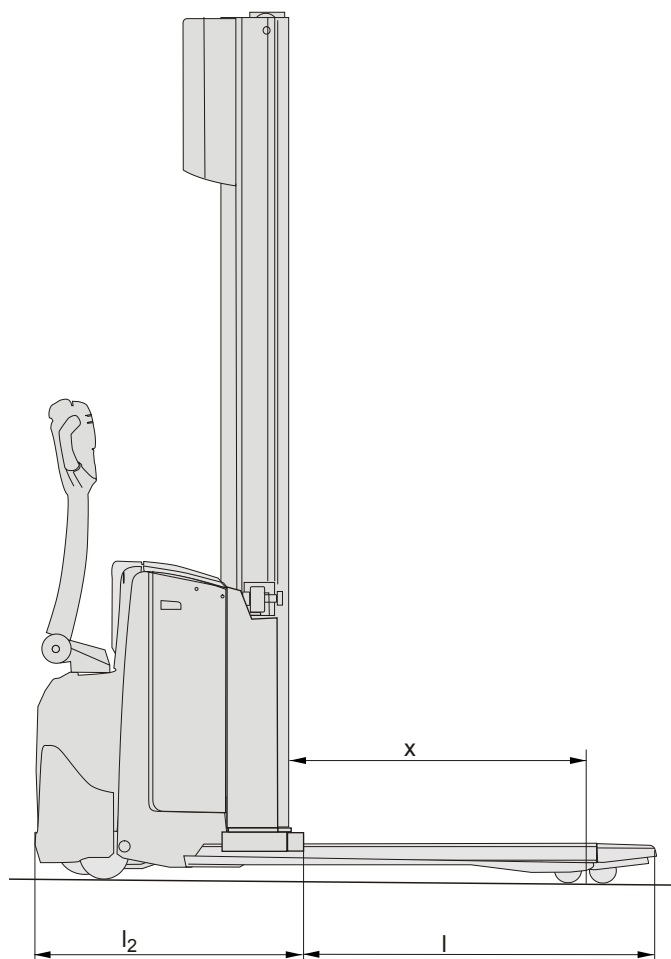
- If cost is a key issue, a conventional charger can be used.
- If the charging duration is decisive (e.g. 8 hours or less), then an HF charger is preferable

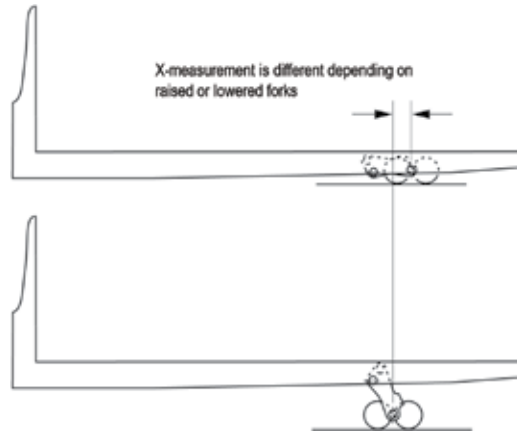
Technical information

Dimensions and performance figures

x measurement

The x measurement is the distance **Back of fork to the fork wheel centre**. For trucks with bogie wheels, it is measured from **Back of fork to fork bogie-wheel centre**. Usually this measurement can be obtained from the Product Information. The x measurement in the Product Information is given for fork length 1150 mm with raised support arms





l measurement

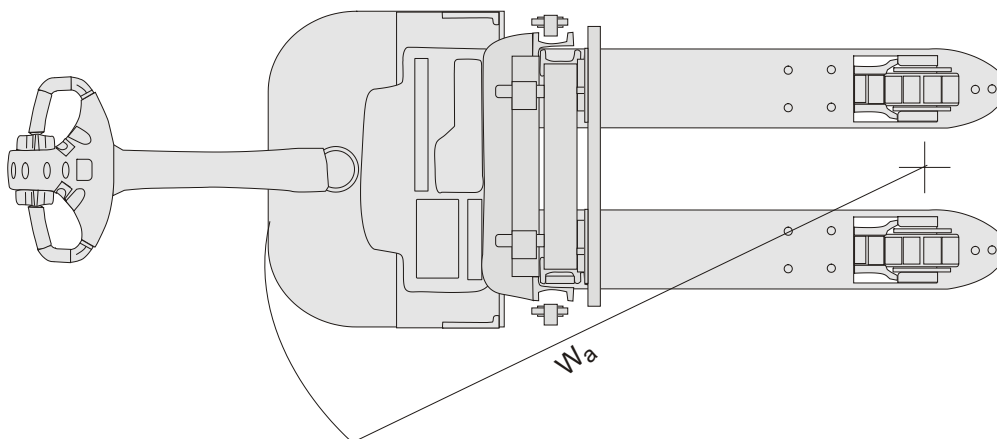
The **l** measurement is the **Total fork length**.

l₂ measurement

The **l₂** measurement is the **Truck length including back of fork**.

W_a, turning radius

The turning radius is the necessary **Distance to rotate the truck around a virtual point called the turning centre**. The Product Information gives the turning radius for forks with length = 1150 mm and raised support arms.



A_{st} – Aisle width requirement

The aisle width requirement can be described as the space required by the truck to pick a pallet from a pallet rack, reverse out into the aisle, turn and proceed down the aisle.

The formula, according to VDI, to calculate the aisle width requirement (in millimetres) is:

Standard:

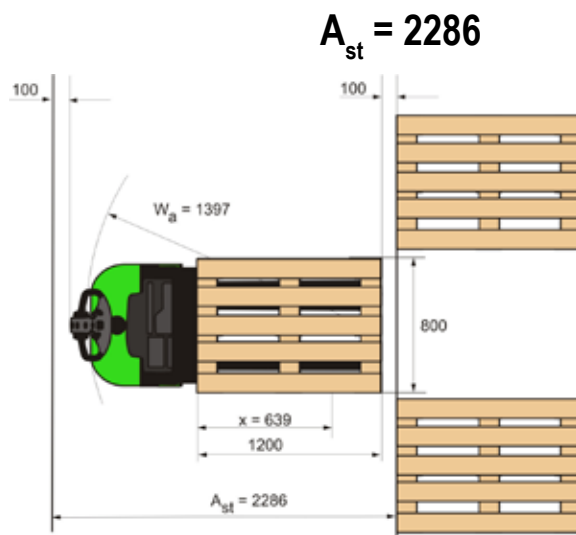
$$A_{st} = W_a + \sqrt{(\text{length of pallet} - x)^2 + \left(\frac{\text{width across pallet}}{2}\right)^2} + 2 \times 100$$

Note: In this formula, the safety distance is always assumed to be 2×100 mm.

Calculating A_{st} according to the standard, S200 range

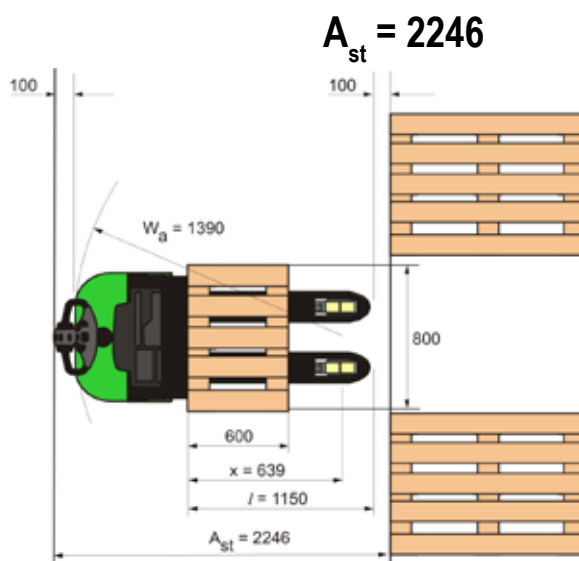
- The values are from the Product information sheet for S212.
800x1200mm short side handling.

Standard: $A_{st} = 1397 + \sqrt{(1200 - 639)^2 + \left(\frac{800}{2}\right)^2} + 2 \times 100$



800x600 longside handling

Standard: $A_{st} = 1397 + \sqrt{(1150 - 639)^2 + \left(\frac{800}{2}\right)^2} + 2 \times 100$



Aisle width requirements

Table valid for:

- S208L: Mono mast Lh 1580 mm
- S210: Duplex Tele Lh 3300 mm
- S212, S212L: Duplex Tele Openview Lh 3300 mm
- S214, S214L: Duplex Tele Openview Lh 3255 mm
- S212S: Duplex Free lift Lh 2655 mm
- S220D: Duplex Tele Lh 2100 mm

Truck	Battery comp.	Wa	Ast	Aisle width for pallets:
S208L	standard	1443	2256	1000x1200 longside handling
	standard	1443	2159	800x1200 shortside handling

Truck	Battery comp.	Wa	Ast	Aisle width for pallets:
S210	small	1340	2231	1000x1200 longside handling
	small	1340	2214	800x1200 shortside handling
	medium	1397	2288	1000x1200 longside handling
	medium	1397	2271	800x1200 shortside handling
	large	1447	2338	1000x1200 longside handling
	large	1447	2321	800x1200 shortside handling

Truck	Battery comp.	Wa	Ast	Aisle width for pallets:
S212	medium	1397	2297	1000x1200 longside handling
	medium	1397	2286	800x1200 shortside handling
	large	1447	2347	1000x1200 longside handling
	large	1447	2336	800x1200 shortside handling
	large sideways	1447	2347	1000x1200 longside handling
	large sideways	1447	2336	800x1200 shortside handling

Truck	Battery comp.	Wa	Ast	Aisle width for pallets:
S214	medium	1397	2297	1000x1200 longside handling
	medium	1397	2286	800x1200 shortside handling
	large	1447	2347	1000x1200 longside handling
	large	1447	2331	800x1200 shortside handling
	large sideways	1447	2347	1000x1200 longside handling
	large sideways	1447	2331	800x1200 shortside handling

Truck	Battery comp.	Wa	Ast	Aisle width for pallets:
S212L	medium	1433	2400	1000x1200 longside handling

Truck	Battery comp.	Wa	Ast	Aisle width for pallets:
	medium	1433	2295	800x1200 shortside handling
	large	1482	2449	1000x1200 longside handling
	large	1482	2344	800x1200 shortside handling
	large sideways	1482	2449	1000x1200 longside handling
	large sideways	1482	2344	800x1200 shortside handling

Truck	Battery comp.	Wa	Ast	Aisle width for pallets:
S214L	medium	1393	2297	1000x1200 longside handling
	medium	1393	2288	800x1200 shortside handling
	large	1443	2347	1000x1200 longside handling
	large	1443	2338	800x1200 shortside handling
	large sideways	1443	2347	1000x1200 longside handling
	large sideways	1443	2338	800x1200 shortside handling

Truck	Battery comp.	Wa	Ast	Aisle width for pallets:
S212S	medium	1353	2292	1000x1200 longside handling
	medium	1353	2300	800x1200 shortside handling
	large	1403	2342	1000x1200 longside handling
	large	1403	2350	800x1200 shortside handling

Truck	Battery comp.	Wa	Ast	Aisle width for pallets:
S220D	medium	1633	2493	1000x1200 longside handling
	medium	1633	2355	800x1200 shortside handling
	large	1683	2498	1000x1200 longside handling
	large	1683	2405	800x1200 shortside handling
	large sideways	1683	2498	1000x1200 longside handling
	large sideways	1683	2405	800x1200 shortside handling

Axle load

Truck type	Mast type	Drive wheel load
S210	All	350
S212	Simplex	350
	Duplex/Triplex	400
S214	All	450
S212L	Simplex	400
	Duplex/Triplex	450
S214L	All	450
S220D	All	570

Wheel Pressure

- Fixed support arms, 570x 1000-1150
- Elevating support arms, 570x 1150
- Wheel pressure for rated load

Model	S210			S210		
Mast	Simplex			Duplex Tele		
Lh (mm)	1700			3300		
Battery compartment	S	M	L	S	M	L
Drive wheel load, kg	350	350	350	350	350	350
Support arm load, kg	1127	1151	1176	1165	1192	1219
Castor wheel load, kg	245	287	323	301	341	374
Machine weight without battery and load	557	568	580	651	663	674
Drive wheel pressure, kg/mm ²	0,20	0,20	0,20	0,20	0,20	0,20
Castor wheel pressure, kg/mm ²	0,25	0,27	0,29	0,28	0,30	0,31
Support arm wheel pressure, boggie (4), kg/mm ²	0,34	0,35	0,35	0,35	0,36	0,36
Support arm wheel, single (2), kg/mm ²	0,43	0,43	0,44	0,44	0,45	0,45

Model	S212		S212		S212	
Mast	Simplex		Dx Tele		Dx Free lift	
Lh (mm)	1700		4150		4150	
Battery compartment	M	L ¹⁾	M	L ¹⁾	M	L ¹⁾
Drive wheel load, kg	400	400	400	400	400	400
Support arm load, kg	1345	1371	1417	1447	1436	1465
Castor wheel load, kg	267	302	336	368	342	373
Machine weight without battery and load	593	604	733	745	759	769
Drive wheel pressure, kg/mm ²	0,22	0,22	0,22	0,22	0,22	0,22
Castor wheel pressure, kg/mm ²	0,26	0,28	0,30	0,32	0,30	0,32
Support arm wheel pressure, boggie (4), kg/mm ²	0,38	0,39	0,40	0,40	0,40	0,40
Support arm wheel, single (2), kg/mm ²	0,57	0,58	0,59	0,60	0,59	0,60

1) Sideways battery change

Model	S212		S212	
Mast	Dx Tele Openview.		Triplex	
Lh (mm)	4150		4500	
Battery compartment	M	L ¹⁾	M	L ¹⁾
Drive wheel load, kg	400	400	400	400
Support arm load, kg	1436	1465	1465	1504
Castor wheel load, kg	342	373	348	379
Machine weight without battery and load	757	769	802	813
Drive wheel pressure, kg/mm ²	0,22	0,22	0,22	0,22
Castor wheel pressure, kg/mm ²	0,30	0,32	0,30	0,32
Support arm wheel pressure, boggie (4), kg/mm ²	0,40	0,40	0,40	0,41
Support arm wheel, single (2), kg/mm ²	0,59	0,60	0,60	0,61

1) For Large and Large sideways battery change

Model	S214		S214		S214	
Mast	Dx Free lift.		Dx Tele Openv..		Tx Free lift	
Lh (mm)	4105		4105		4755	
Battery compartment	M	L ¹⁾	M	L ¹⁾	M	L ¹⁾
Drive wheel load, kg	450	450	450	450	450	450
Support arm load, kg	1625	1657	1626	1657	1673	1704
Castor wheel load, kg	301	332	301	332	313	344
Machine weight without battery and load	758	769	758	769	816	828
Drive wheel pressure, kg/mm ²	0,24	0,24	0,24	0,24	0,24	0,24
Castor wheel pressure, kg/mm ²	0,28	0,30	0,28	0,30	0,29	0,30
Support arm wheel pressure, boggie (4), kg/mm ²	0,43	0,43	0,43	0,43	0,43	0,44
Support arm wheel, single (2), kg/mm ²	0,46	0,64	0,64	0,64	0,64	0,66

1) Sideways battery change

Model	S212L		S212L	
Mast	Simplex		Duplex Tele.	
Lh (mm)	1700		4150	
Battery compartment	M	L ¹⁾	M	L ¹⁾
Drive wheel load, kg	450	450	450	450
Support arm load, kg	1598	1628	1669	1701
Castor wheel load, kg	361	393	431	459
Machine weight without battery and load	589	600	730	741
Drive wheel pressure, kg/mm ²	0,24	0,24	0,24	0,24
Castor wheel pressure, kg/mm ²	0,31	0,33	0,35	0,36
Support arm wheel pressure, boggie (4), kg/mm ²	0,42	0,43	0,43	0,44
Support arm wheel, single (2), kg/mm ²	0,63	0,64	0,65	0,65

1) Sideways battery change

Model	S212L		S212L	
Mast	Triplex		Dx Tele Openview	
Lh (mm)	4500		4150	
Battery compartment	M	L ¹⁾	M	L ¹⁾
Drive wheel load, kg	450	450	450	450
Support arm load, kg	1726	1760	1687	1720
Castor wheel load, kg	442	469	436	465
Machine weight without battery and load	799	810	754	765
Drive wheel pressure, kg/mm ²	0,24	0,24	0,24	0,24
Castor wheel pressure, kg/mm ²	0,35	0,36	0,35	0,36
Support arm wheel, single (2), kg/mm ²	0,66	0,67	0,65	0,66

1) Sideways battery change

Model	S214L		S214L	
Mast	Dx Tele Openview		Triplex	
Lh (mm)	4150		4500	
Battery compartment	M	L ¹⁾	M	L ¹⁾
Drive wheel load, kg	450	450	450	450
Support arm load, kg	1687	1720	1726	1760
Castor wheel load, kg	436	465	442	470
Machine weight without battery and load	754	765	799	810
Drive wheel pressure, kg/mm ²	0,24	0,24	0,24	0,24
Castor wheel pressure, kg/mm ²	0,35	0,36	0,35	0,36
Support arm wheel pressure, boggie (4), kg/mm ²	0,44	0,44	0,44	0,45
Support arm wheel, single (2), kg/mm ²	0,65	0,66	0,66	0,67

1) Sideways battery change

Model	S220D		S220D	
Mast	Duplex Tele		Dx Tele Openview	
Lh (mm)	2100		2100	
Battery compartment	M	L ¹⁾	M	L ¹⁾
Drive wheel load, kg	570	570	570	570
Support arm load, kg	1729	1766	1743	1780
Castor wheel load, kg	570	595	571	595
Machine weight without battery and load	649	660	664	675
Drive wheel pressure, kg/mm ²	0,27	0,27	0,27	0,27
Castor wheel pressure, kg/mm ²	0,41	0,42	0,41	0,42
Support arm wheel pressure, boggie (4), kg/mm ²	0,44	0,45	0,44	0,45
Support arm wheel, single (2), kg/mm ²	0,66	0,67	0,66	0,67

1) Sideways battery change

Model	S212S		S212S		S212S	
Mast	Simplex		Duplex Tele		Dx Tele Openv.	
Lh (mm)	1655		4105		4105	
Battery compartment	M	L	M	L	M	L
Drive wheel load, kg	671	705	734	763	736	766
Support arm load, kg	1479	1511	1563	1594	1584	1615
Machine weight without battery and load	735	746	876	887	900	911
Drive wheel pressure, kg/mm ²	0,30	0,31	0,32	0,32	0,32	0,33
Support arm wheel, single (2), kg/mm ²	0,61	0,61	0,62	0,63	0,62	0,61

Model	S212S		S208L
Mast	Triplex		Mono
Lh (mm)	4455		1580
Battery compartment	M	L	
Drive wheel load, kg	728	757	747
Support arm load, kg	1620	1652	1807
Castor wheel load, kg			150
Machine weight without battery and load	928	939	492
Drive wheel pressure, kg/mm ²	0,32	0,32	0,32
Castor wheel pressure, kg/mm ²			0,19
Support arm wheel pressure, boggie (4), kg/mm ²	0,43	0,43	0,45
Support arm wheel, single (2), kg/mm ²	0,64	0,64	0,68

Fork dimensions

- Fixed support arms, 570x 1000-1150
- Elevating support arms, 570x 1150

Model	S210			S210		
Mast	Simplex			Duplex Tele		
Lh (mm)	1700			3300		
Battery compartment	S	M	L	S	M	L
L ₂ measurement, mm	676	733	783	683	740	790
x-measurement, mm	664	664	664	657	657	657
Drive wheel - front border	150	150	150	150	150	150
Wheel base y, mm	1190	1247	1297	1190	1247	1297
Axle - support arm tip, mm	169	169	169	169	169	169
Back of forks - support arm tip, mm	833	833	833	826	826	826

Model	S212		S212		S212	
Mast	Simplex		Dx Tele		Dx Free lift	
Lh (mm)	1700		4150		4150	
Battery compartment	M	L ¹⁾	M	L ¹⁾	M	L ¹⁾
L ₂ measurement, mm	772	822	750	800	758	808
x-measurement, mm	625	625	647	647	639	639
Drive wheel - front border	150	150	150	150	150	150
Wheel base y, mm	1247	1297	1247	1297	1247	1297
Axle - support arm tip, mm	169	169	169	169	169	169
Back of forks - support arm tip, mm	794	794	816	816	808	808

1) Sideways battery change

Model	S212		S212	
Mast	Dx Tele Openview.		Triplex	
Lh (mm)	4150		4500	
Battery compartment	M	L ¹⁾	M	L ¹⁾
L ₂ measurement, mm	758	808	775	825
x-measurement, mm	639	639	622	622
Drive wheel - front border	150	150	150	150
Wheel base y, mm	1247	1297	1247	1297
Axle - support arm tip, mm	169	169	169	169
Back of forks - support arm tip, mm	808	808	791	791

1) Sideways battery change

Model	S214		S214		S214	
Mast	Dx Free lift.		Dx Tele Openv.		Tx Free lift	
Lh (mm)	4105		4105		4755	
Battery compartment	M	L ¹⁾	M	L ¹⁾	M	L ¹⁾
L ₂ measurement, mm	758	808	758	808	775	825
x-measurement, mm	639	639	639	639	622	622
Drive wheel - front border	150	150	150	150	150	150
Wheel base y, mm	1247	1297	1247	1297	1247	1297
Axle - support arm tip, mm	169	169	169	169	169	169
Back of forks - support arm tip, mm	808	808	808	808	791	791

1) Sideways battery change

Model	S212L		S212L	
Mast	Simplex		Duplex Tele.	
Lh (mm)	1700		4150	
Battery compartment	M	L ¹⁾	M	L ¹⁾
L ₂ measurement, mm	735	785	753	803
x-measurement, mm	717	717	799	699
x-measurement lifted support arms, mm	658	658	640	640
Drive wheel - front border	150	150	150	150
Wheel base y, mm	1302	1352	1302	1352
Wheel base lifted support arms y, mm	1243	1293	1243	1293
Axle - support arm tip, mm	212	212	212	212
Axle - support arm tip lifted support arms, mm	153	153	153	153
Back of forks - support arm tip, mm	870	870	852	852

1) Sideways battery change

Model	S212L		S212L	
Mast	Triplex		Dx Tele Openview	
Lh (mm)	4500		4150	
Battery compartment	M	L ¹⁾	M	L ¹⁾
L ₂ measurement, mm	778	828	761	811
x-measurement, mm	674	674	691	691
x-measurement lifted support arms, mm	615	615	632	632
Drive wheel - front border	150	150	150	150
Wheel base y, mm	1302	1352	1302	1352
Wheel base lifted support arms y, mm	1243	1293	1243	1293
Axle - support arm tip, mm	212	212	212	212
Axle - support arm tip lifted support arms, mm	153	153	153	153
Back of forks - support arm tip, mm	827	827	844	844

1) Sideways battery change

Model	S214L		S214L	
Mast	Dx Tele Openview		Triplex	
Lh (mm)	4150		4500	
Battery compartment	M	L ¹⁾	M	L ¹⁾
L ₂ measurement, mm	761	810	778	828
x-measurement, mm	691	691	674	674
x-measurement lifted support arms, mm	632	632	615	615
Drive wheel - front border	150	150	150	150
Wheel base y, mm	1302	1352	1302	1352
Wheel base lifted support arms y, mm	1243	1352	1243	1293
Axle - support arm tip, mm	212	212	212	212
Axle - support arm tip lifted support arms, mm	153	153	153	153
Back of forks - support arm tip, mm	844	844	827	827

1) Sideways battery change

Model	S220D		S220D	
Mast	Duplex Tele		Dx Tele Openview	
Lh (mm)	2100		2100	
Battery compartment	M	L ¹⁾	M	L ¹⁾
L ₂ measurement, mm	760	760	768	768
x-measurement, mm	932	982	924	974
x-measurement lifted support arms, mm	873	923	865	915
Drive wheel - front border	150	150	150	150
Wheel base y, mm	1542	1592	1542	1592
Wheel base lifted support arms y, mm	1483	1533	1483	1533
Axle - support arm tip, mm	212	212	212	212
Axle - support arm tip lifted support arms, mm	153	153	153	153
Back of forks - support arm tip, mm	1085	1135	1077	1127

1) Sideways battery change

Model	S212S		S212S		S212S	
Mast	Simplex		Duplex Tele		Dx Tele Openv..	
Lh (mm)	1655		4105		4105	
Battery compartment	M	L	M	L	M	L
L ₂ measurement, mm	766	816	784	834	792	842
x-measurement, mm	587	587	569	569	561	561
Drive wheel - front border	150	150	150	150	150	150
Wheel base y, mm	1203	1253	1203	1253	1203	1253
Axle - support arm tip, mm	113	113	113	113	113	113
Back of forks - support arm tip, mm	700	700	682	682	674	674

Model	S212S		S208L
Mast	Triplex		Mono
Lh (mm)	4455		1580
Battery compartment	M	L	
L ₂ measurement, mm	809	859	628
x-measurement, mm	544	544	874
x-measurement lifted support arms, mm			815
Drive wheel - front border	150	150	150
Wheel base y, mm	1203	1253	1352
Wheel base lifted support arms y, mm			1293
Axle - support arm tip, mm	113	113	
Back of forks - support arm tip, mm	657	657	1100

Support arm dimensions

Truck type	Mast	Lift height	Fork length	Battery	X-measure	Supp. arm length
S210	Simplex	1700	1000-1800	S/M/L	664	832
	Duplex	3300	1000-1800	S/M/L	657	825
S212	Simplex	1700	1000-1800	M/L	625	793
	Duplex Tele	4150	1000-1800	M/L	647	815
	Duplex Free lift	4150	1000-1800	M/L	639	807
	Triplex	4500	1000-1800	M/L	622	790
S214	Duplex Tele	4105	1000-1800	M/L	639	807
	Duplex Free lift	4105	1000-1800	M/L	639	807
	Triplex	4755	1000-1800	M/L	622	790
S212L	Simplex	1700	1000-1200	M/L	717	865
	Duplex Tele	4150	1000-1200	M/L	699	847
	Triplex	4500	1000-1200	M/L	674	822
S214L	Duplex Tele	4150	1000-1150	M/L	691	839
	Triplex	4500	1000-1200	M/L	674	822
S220D	Duplex Tele	2100	1000-1200	M	932	1080
	Duplex Tele	2100	1000-1200	L	982	1130
	Duplex Tele Openv.	2100	1000-1200	M	924	1072
	Duplex Tele Openv.	2100	1000-1200	L	974	1122
S212S	Simplex	1655	1000-1200	M/L	587	699
	Duplex	4105	1000-1200	M/L	569	681
	Duplex Tele	4105	1000-1200	M/L	561	673
	Triplex	4455	1000-1150	M/L	544	656
S208L		1580	1150-1200		874	1104

All the dimension given in mm.

Battery weights

S208L (two-piece design)

Batt. compartment	Min. batt. weight kg	Max. batt. weight kg	Capacity Ah	Volt V	Size L*W*H mm
S208L	168	214	180	2 x 12	248 x 258 x 583
S208L	168	214	230	2 x 12	248 x 258 x 583

S210

Batt. compartment	Min. batt. weight kg	Max. batt. weight kg	Capacity Ah	Volt V	Size L*W*H mm
Small	120	165	150	24	651 x 150 x 570
Medium	189	250	225	24	645 x 196 x 570
Large	230	280	300	24	645 x 245 x 570

S212S

Batt. compartment	Min. batt. weight kg	Max. batt. weight kg	Capacity Ah	Volt V	Size L*W*H mm
Medium	189	250	225	24	645 x 196 x 570
Large	230	280	300	24	645 x 245 x 570

S212/S212L

Batt. compartment	Min. batt. weight kg	Max. batt. weight kg	Capacity Ah	Volt V	Size L*W*H mm
Medium	189	250	225	24	645 x 196 x 570
Large	230	280	300	24	645 x 245 x 570
Large, sideways batt. change	209	250	260	24	645 x 245 x 524

S214/S214L

Batt. compartment	Min. batt. weight kg	Max. batt. weight kg	Capacity Ah	Volt V	Size L*W*H mm
Medium	189	250	225	24	645 x 196 x 570
Large	230	280	300	24	645 x 245 x 570
Large, sideways batt. change	209	250	260	24	645 x 245 x 524

S220D

Batt. compartment	Min. batt. weight kg	Max. batt. weight kg	Capacity Ah	Volt V	Size L*W*H mm
Medium	189	250	225	24	645 x 196 x 570
Large	230	280	300	24	645 x 245 x 570
Large, sideways batt. change	209	250	260	24	645 x 245 x 524

Residual capacity

Tables are valid for all battery sizes

S210: Forks 1000 — 1800 mm, chassis width 770 mm, all masts						
Lh (mm)	WOF = 536		WOF = 570		WOF = 685	
	TP = 600 mm	TP = 800 mm	TP = 600 mm	TP = 800 mm	TP = 600 mm	TP = 800 mm
1400	1000	750	1000	750	1000	750
1700	1000	750	1000	750	1000	750
2700	1000	750	1000	750	1000	750
2900	950	710	1000	750	1000	750
3300	750	560	800	600	1000	750
S212: Forks 1000 — 1800 mm, chassis width 770 mm, all mast						
Lh (mm)	WOF = 536		WOF = 570		WOF = 685	
	TP = 600 mm	TP = 800 mm	TP = 600 mm	TP = 800 mm	TP = 600 mm	TP = 800 mm
1400	1200	900	1200	900	1200	900
1700	1200	900	1200	900	1200	900
2700	1200	900	1200	900	1200	900
2900	1150	860	1200	900	1200	900
3300	925	640	950	710	1200	900
3700	725	540	775	580	1000	750
4150	550	410	600	450	775	580
4500	450	335	500	375	625	465
S212L: Forks 1000 — 1800 mm, chassis width 770 mm, all mast (Battery M)						
Lh (mm)	WOF = 536		WOF = 570			
	TP = 600 mm	TP = 800 mm	TP = 600 mm	TP = 800 mm		
1400	1200	900	1200	900		
1700	1200	900	1200	900		
2400	1200	900	1200	900		
2500	1155	865	1200	900		
2700	1075	805	1150	860		
2900	975	730	1025	765		
3300	775	580	825	615		
4150	625	465	675	505		
4150	500	375	550	410		
4500	425	315	475	355		
S212L: Forks 1000 — 1800 mm, chassis width 770 mm, all mast (Battery L or M with platform)						
Lh (mm)	WOF = 536		WOF = 570			
	TP = 600 mm	TP = 800 mm	TP = 600 mm	TP = 800 mm		
2400	1400	1050	1400	1050		
2500	1350	1010	1400	1050		
2600	1200	900	1250	935		
2700	950	710	1000	750		
2900	775	580	825	615		
330	575	450	675	470		
3700	475	335	525	390		
4150	400	330	475	355		
4500	425	315	475	355		

S214: Forks 1000 — 1800 mm, chassis width 850 mm, all mast						
Lh (mm)	WOF = 536		WOF = 570		WOF = 685	
	TP = 600 mm	TP = 800 mm	TP = 600 mm	TP = 800 mm	TP = 600 mm	TP = 800 mm
2655	1400	1050	1400	1050	1400	1050
2855	1350	1010	1400	1050	1400	1050
3255	1075	800	1125	840	1400	1050
3655	875	650	925	690	1200	900
4105	700	525	750	560	925	690
4455	550	410	600	450	800	600
4755	500	375	550	410	700	525

S214L: Forks 1000 — 1800 mm, chassis width 770 mm, all mast (Battery M)						
Lh (mm)	WOF = 536		WOF = 570			
	TP = 600 mm	TP = 800 mm	TP = 600 mm	TP = 800 mm		
2200	1400	1050	1400	1050		
2300	1330	1000	1400	1050		
2450	1235	925	1400	1050		
2500	1200	900	1355	1015		
2555	1165	870	1310	980		
2655	1100	825	1225	915		
2855	1000	750	1100	825		
3255	825	615	875	650		
3655	650	485	700	525		
4105	525	390	575	430		
4455	450	335	500	375		
4755	375	280	425	315		

S214L: Forks 1000 — 1800 mm, chassis width 850 mm, all mast (Battery M)						
Lh (mm)	WOF = 536		WOF = 570			
	TP = 600 mm	TP = 800 mm	TP = 600 mm	TP = 800 mm		
2000	1400	1050	1400	1050		
2300	1400	1050	1400	1050		
2500	1255	940	1400	1050		
2555	1220	910	1355	1015		
2655	1150	860	1275	955		
2855	1050	785	1100	825		
3255	850	635	900	675		
3655	700	525	750	560		
4105	575	430	625	465		
4455	500	375	550	410		
4755	425	315	475	355		

S214L: Forks 1000-1800mm, chassis width 770mm all masts (Battery L or M with platform)						
Lh (mm)	WOF = 536		WOF = 570			
	TP = 600 mm	TP = 800 mm	TP = 600 mm	TP = 800 mm		
2100	1400	1050	1400	1050		
2200	1400	1050	1400	1050		
2300	1400	1050	1400	1050		
2500	1255	940	1400	1050		
2555	1220	910	1355	1015		
2655	1150	860	1275	955		
2855	1050	785	1100	825		
3255	825	615	875	650		
3655	650	485	700	525		
4105	525	390	575	430		
4455	450	335	500	375		
4755	375	280	425	315		
S214L: Forks 1000 — 1800 mm, chassis width 850 mm all masts (Battery L or M with platform)						
Lh (mm)	WOF = 536		WOF = 570			
	TP = 600 mm	TP = 800 mm	TP = 600 mm	TP = 800 mm		
2100	1400	1050	1400	1050		
2200	1400	1050	1400	1050		
2300	1400	1050	1400	1050		
2400	1400	1050	1400	1050		
2500	1300	975	1400	1050		
2555	1260	945	1400	1050		
2655	1175	880	1275	950		
2855	1050	785	1100	825		
3255	850	635	900	675		
3655	700	525	750	560		
4105	575	430	625	465		
4455	500	375	550	410		
4755	425	315	475	355		
S208L: All fork sizes, chassis width 770 mm						
Lh (mm)	WOF = 536		WOF = 570			
	TP = 600 mm	TP = 800 mm	TP = 600 mm	TP = 800 mm		
600	800	600	800	600		
1580	800	600	800	600		
S212S: Forks 1000 — 1800 mm, chassis width 770 mm, mast: Tele Openview and Triplex						
Lh (mm)	WOF max 800 mm					
	LC = 600 mm	LC = 800 mm				
2655	1200	900				
2855	1200	900				
3255	1200	900				
3655	1200	900				
4105	1200	900				
4455	1200	900				
4755	1200	900				

S212S: Forks 1000-1800 mm, chassis width 770 mm, masts: Simplex and Duplex Tele						
Lh (mm)	WOF max 800 mm					
	TP = 600 mm	TP = 800 mm				
1355	1200	900				
1655	1200	900				
2655	1200	900				
2855	1200	900				
3255	1200	900				
3655	900	675				
4105	700	525				
S212S: Forks 1000-1800 mm, chassis width 770 mm, mast: Duplex Free lift						
Lh (mm)	WOF max 800 mm					
	TP = 600 mm	TP = 800 mm				
2655	1200	900				
2855	1200	900				
3255	1200	900				
3655	1200	900				
3905	1200	900				
4105	950	710				
S220D: All forks, chassis width 770 mm, all masts						
Lh (mm)	WOF = 536 mm		WOF = 570 mm			
	TP = 600 mm	TP = 800	TP = 600 mm	TP = 800 mm		
1700	1200	900	1200	900		
1900	1050	785	1150	860		
2100	900	675	1000	750		
S220D: Double stacking						
Lh (mm)	WOF = 536 mm		WOF = 570 mm			
Forks	Max allowed weight on support arms	Min required weight on support arms	Max allowed weight on support arms	Min required weight on support arms		
0	2000	0	2000	0		
100	1900	100	1900	100		
200	1800	200	1800	200		
300	1700	300	1700	300		
400	1600	400	1600	400		
500	1500	500	1500	500		
600	1400	600	1400	600		
700	1300	700	1300	700		
800	—	—	1200	800		

Mast dimensions

Mast	Max. mast height h_4	Min. mast height h_1	Free lift
Mono Lh 600 mm	908	908	600
Mono Lh 1580 mm	1863	1863	1580
Simplex 100 Lh 1400 mm	1825	1825	1400
Simplex 100 Lh 1700 mm	2125	2125	1700
Duplex 100 Lh 2700 mm	3125	1851	166
Duplex 100 Lh 2900 mm	3325	1951	166
Duplex 100 Lh 3300 mm	3725	2151	166
Simplex 120 Lh 1400 mm	1825	1825	1400
Simplex 120 Lh 1700 mm	2125	2125	1700
Duplex 120 Lh 1700 mm	2125	1351	166
Duplex 120 Lh 1900 mm	2325	1451	166
Duplex 120 Lh 2100 mm	2525	1551	166
Duplex 120 Lh 2700 mm	3125	1851	166
Duplex 120 Lh 2900 mm	3325	1951	166
Duplex 120 Lh 3300 mm	3725	2151	166
Duplex 120 Lh 3700 mm	4125	2351	166
Duplex 120 Lh 4150 mm	4575	2576	166
Duplex Tele, Openview 120 Lh 1700 mm	2120	1335	166
Duplex Tele, Openview 120 Lh 1900 mm	2320	1435	166
Duplex Tele, Openview 120 Lh 2100 mm	2520	1535	166
Duplex Tele, Openview 120 Lh 2700 mm	3120	1835	166
Duplex Tele, Openview 120 Lh 2900 mm	3320	1935	166
Duplex Tele, Openview 120 Lh 3300 mm	3720	2135	166
Duplex Tele, Openview 120 Lh 3700 mm	4120	2335	166
Duplex Tele, Openview 120 Lh 4150 mm	4570	2560	166

Mast	Max. mast height h_4	Min. mast height h_1	Free lift
Duplex Free lift 120 Lh 2700 mm	3141	1835	1420
Duplex Free lift 120 Lh 2900 mm	3341	1935	1520
Duplex Free lift 120 Lh 3300 mm	3741	2135	1720
Duplex Free lift 120 Lh 3700 mm	4141	2335	1920
Duplex Free lift 120 Lh 4150 mm	4591	2560	2144
Triplex Free lift 120 Lh 3300 mm	3747	1695	1270
Triplex Free lift 120 Lh 3700 mm	4149	1829	1404
Triplex Free lift 120 Lh 4150 mm	4599	1979	1554
Triplex Free lift 120 Lh 4500 mm	4947	2095	1670
Duplex Tele, Openview 140 Lh 2655 mm	3125	1860	166
Duplex Tele, Openview 140 Lh 2855 mm	3325	1960	166
Duplex Tele, Openview 140 Lh 3255 mm	3725	2160	166
Duplex Tele, Openview 140 Lh 3655 mm	4125	2360	166
Duplex Tele, Openview 140 Lh 4105 mm	4575	2585	166
Duplex Free lift 140 Lh 2655 mm	3141	1835	1374
Duplex Free lift 140 Lh 2855 mm	3341	1935	1474
Duplex Free lift 140 Lh 3255 mm	3741	2135	1674
Duplex Free lift 140 Lh 3655 mm	4141	2335	1874
Duplex Free lift 140 Lh 4105 mm	4591	2560	2099
Triplex Free lift 140 Lh 3255 mm	3747	1695	1224
Triplex Free lift 140 Lh 3655 mm	4149	1829	1358
Triplex Free lift 140 Lh 4105 mm	4599	1979	1508
Triplex Free lift 140 Lh 4455 mm	4947	2095	1624
Triplex Free lift 140 Lh 4755 mm	5247	2195	1724

Battery and charger

Information on Hawker Evolution GEL batteries

Hawker Evolution GEL batteries is the only type of valve-regulated batteries offered for the trucks in the S200 series. Please note the following if selecting a battery of this type for the truck:

- The batteries are intended for low-intensive applications only, where trucks are used one shift per day and no more than six days per week.
- The expected service life is 1,000 charging cycles.
- The batteries should not be dis-charged more than to 70% (to be compared with 80% for freely ventilated batteries).
- Ambient temperature for battery operation is +15°C to +30°C.
- For uninterrupted battery warranty coverage, only charge with Hawker approved chargers with monitoring of the charge cycle.
- Normal charging duration is 12 h.
- Equalising charging is required after each sixth charge cycle. Never leave the truck completely discharged. Fully charged, the truck can be left inoperative for maximum 2 months with equalising charging once every month.

Freely ventilated batteries

Battery charger recommendation table for freely ventilated batteries

Battery size	Unregulated charger, charging duration ≥ 8 h	HF charger (regulated), charging duration ≤ 8 h
150 Ah	30 A	30 Hz
225 Ah	50 A	45 Hz
260 Ah	60 A	45 Hz
300 Ah	60 A	60 Hz

Options

To adapt the truck to customer preferences, a number of options are available.

Battery change from the side

Battery roller bed which enables sideways battery replacement (only for trucks with a large battery compartment). Not available on S208L, S212S and S210.

Feature

The battery rests on a roller bed inside the battery compartment.

Benefit

Changing the battery is quick and easy, resulting in improved productivity since the truck can be fully utilised even for shift operation.



Feature

The battery is secured using an excenter locking system.

Benefit

Changing the battery is quick and easy.



Battery change table

To facilitate battery change from the side, an external battery change table is also available. The height from the floor to the top of the rollers is adjustable. Please note that both the legs and the roller bed can be adjusted. The length and width of the table is 834 x 912 mm..

Feature

The battery change table features a roller bed and can hold two batteries.

Benefit

It enables quick, efficient battery replacement.



Extra battery cables

If several batteries are used, optional battery cables can be ordered.

Feature

Each battery can then have its own cable, always fixed to the battery.



Benefit

Battery replacement is even more quick and easy, since there is no need for disconnecting and reconnecting the cables from one battery to the other.

Battery change cable

A battery change cable is used to connect the battery and truck when changing batteries using a battery change table.

Feature

Length of cable 1100 mm.



Benefit

The length of the cable makes it possible to move the truck to the charged battery when a battery change table is used.

Built-in charger

The charger has a capacity of 30 A. It is self-adjusting and can be used for voltages between 195 V and 264 V AC, 47 to 63 Hz. Freely ventilated batteries up to 320 Ah and valve regulated batteries from 134 to 201 Ah can be charged

Feature

The built-in charger enables battery charging with the truck connected to a wall outlet.

Benefit

This simplifies the charging procedure, especially on sites with only a few trucks. It also is possible to charge the truck in different places in the hall.

Feature

When the truck is charging, this is indicated in the display. During charging, dashes blink to indicate charging progress. When charging is complete, the character display indicates the number of Ah charged into the battery.

Benefit

It is easy to determine when the battery has been fully charged and how much energy has been used in the process.



Feature

The start function is electronically blocked when the truck is charging. If the operator is logged in when the charger is connected to the wall socket, he will be logged out automatically.

Benefit

This prevents unintentional truck travel with the cable connected to the wall socket. This is a highly reliable function since it does not use any mechanical switches prone to wear.

Feature

A service technician must program the size and type of battery. If the battery is replaced, parameters can easily be changed.

Benefit

Optimised charging even if the battery is replaced during the truck's lifetime.

Feature

Any error codes generated by the battery charger are displayed on the display.

Benefit

This simplifies fault diagnosis if required.



Feature

When the built-in charger is used, it is not possible to charge the battery unless the battery cover is opened since the power cord needs to be pulled out from behind the cover.

Benefit

Opening of the cover assures proper ventilation during charging.

Feature

The number of Ah charged into the battery during the past 50 charging instances can be verified. For more information, see the service manual.

Benefit

It is possible to monitor battery care.

Integrated accessories bar

All trucks in the S200 series can be fitted with an optional Accessories bar. This is CESAB's standard solution for mounting a writing holder, plastic film holder, computer terminal, PC, scanner or other electronic equipment required onboard the truck. These options can be mounted with special mounting brackets designed for the Accessories bar.

Feature

The mounting brackets can be used on all CESAB trucks fitted with an Accessories bar. They are easy to install and just as easy to remove.

Benefit

Accessories can easily be moved between different trucks.

Feature

The Accessories bar is a tested and rugged solution.

Benefit

Accessories remain securely in place on the truck even during rough handling.

Feature

The accessories bar can be equipped with an outlet with a 12 V or 24 V power supply. This option cannot be combined with the built-in charger.

Benefit

Enables connection of optional equipment, e.g. a PC.



Automatic height adjustment

The S208L can be fitted with automatic height detection to detect the height of the lifted load using a photocell, although not in combination with accessories bar. When the truck is ordered with automatic height adjustment it will always be equipped with a plexi finger protection. This finger protection is also available without automatic height adjustment.

Feature

Automatic adjustment of the fork height.

Benefit

The work height is optimum at all times. This reduces strain injuries while raising productivity.

Feature

This function can be switched on for upward or downward movement using buttons on the steering handle.

Benefit

The function is very easy to activate.



Feature

The photocell, which detects whether the forks should be lifted or lowered when a layer of goods is removed or added, can be moved along the mast.

Benefit

This way, the operator always has a comfortable work height.



Feature

This automatic feature cannot be used to lower the goods to floor level.

Benefit

This prevents crushing the operator's feet.

Feature

An additional emergency stop switch is available to shut off all truck functions.

Benefit

The extra emergency stop switch enables the operator to immediately cancel the auto function.

**Feature**

This function can only be activated when the tiller arm is in the upright position, and it is cancelled whenever another truck function is used. When this function is active, the yellow indicator in the photocell lights.

Benefit

This reduces the risk of inadvertent activation of the function and forgetting the function is engaged.

Turtle button

The turtle button allows temporary reduction of speed. The default setting for speed reduction is – 50 %, i.e. the travel speed will be reduced to 3 km/h. If necessary, this can be reprogrammed.

Feature

When the turtle button is pressed once, the truck enters the turtle mode and travels at reduced speed. When the button is pressed once more, the truck returns to the standard speed.

Benefit

It is easy to activate and disengage the turtle speed mode. If the truck is used in locations with many people or to handle fragile goods, this is an indispensable option.

Feature

When the truck is in the turtle mode, "SLO" blinks in the character display.

Benefit

The operator can verify the current travel mode at a glance.



Operator platform

For long-distance travel, an operator platform is a useful option. The S200 series offers two different platform types, one with a rubber mat and automatic fold-up and a cold-store version with a checkered plate and also automatic fold-up. The platform is available on all models except S208L. The platform option includes a shorter tiller arm, optimized for platform operation. The minimum/maximum height of the tiller arm in operation mode (h14) is 1055/1235 mm. The platform itself is secured to the truck body using two bolts on each side, and as a result it is easy to replace.

Feature

In the folded up position, the platform is suspended 610 mm above ground, while the chassis has been designed to offer sufficient space for the feet behind the platform.

Benefit

It is easy to lower the platform with the foot, this way promoting easy entry onto the truck.

Feature

The platform is die cast with crossbars for added rigidity and a reinforced circumferential edge.

Benefit

Thanks to this rugged construction, the platform can withstand heavy-duty use.

Feature

The platform is covered with a thick comfort mat with a rugged pattern.

Benefit

The mat reduces vibration and provides high friction, an important issue to prevent slipping.

Feature

The platform is mounted on a rotating axis.

Benefit

To reduce the risk of strain on the operator's knees, legs and back, the rotating axis has a rugged design with excellent damping characteristics.

Feature

The cold-store version of the platform uses a checkered plate.

Benefit

The checkered plate assures good friction even in cold stores and also in foodstuff applications where operators often wear wet or slippery shoes.

Feature

The platform is secured to a frame with rounded corners.

Benefit

The frame offers numerous benefits:

- In case of collisions, it distributes the force of impact evenly to protect the truck chassis.
- The rounded corners ensure maintained manoeuvrability even on trucks with mounted platform.
- It protects the platform securing points when the operator walks alongside the truck.
- The frame acts as a mechanical stopper to protect the rotating axis when the truck travels across bumps or with very heavy operators.

Load support

The optional load support is attached to the back of the forks and is available on all S200 trucks except S208L

Feature

The load support has a height of 1000 mm (from the top of the forks).

Benefit

This added support protects the operator and goods.

Feature

The load support is bolted onto the fork back.

Benefit

The load support can easily be post-fitted.



Hydraulic oil for low temperatures

This is used on trucks operated in cold environments. It allows truck operation in temperatures down to –35 degrees Celsius.

Feature

The oil is designed to withstand low temperatures.

Benefit

The truck's lift and lowering functions can be used even in cold environments.

Coldstore platform

Platform for CESAB S200.

Feature

The coldstore version of the platform uses a checkered plate.

Benefit

The checkered plate assures good friction in cold stores, and in applications where operators often wear wet or slippery shoes.



