CAR STACKERS
automated parking systems

STACK PARKER - V2

Maximum Flexibility

Technical data sheet

- ✓ CE certified
- ✓ Space saving
- ✓ Dependent parking
- ✓ Low maintenance cost
- ✓ Low installation cost
- ✓ Low noise

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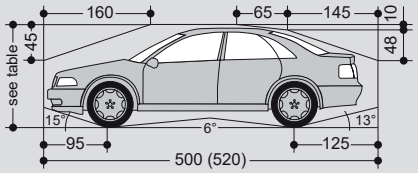
V2 (V2-R)
▶ Stack Parker

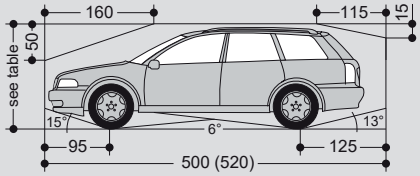
Dimensions

- All dimensions specified are the minimum, finished dimensions.
- Tolerances for the dimensions $^{+3}_{0}$. (1)
- Dimensions are in cm.

Standard passenger car (L)



Standard station wagon (K)



Parking possibilities

Standard passenger cars: Saloon, estate, SUV, Van according to clearance gauge and maximum parking space load.

For countries where snow loads do not have to be taken into account:

	Standard V2	Reinforced V2-R
Width in cm	190 (2)	190 (2)
Weight in kg	2000	2600
Wheel load in kg	500	650

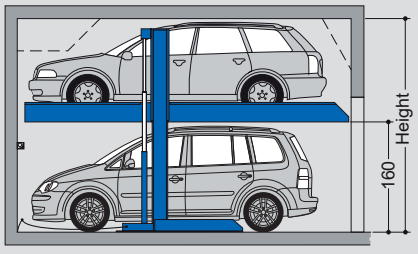
For countries where snow loads have to be taken into account, the parking space on the upper parking space space is reduced according to the following table:

	Standard V2	Reinforced V2-R
Width in cm	190 (2)	190 (2)
Weight in kg	1500	2000
Wheel load in kg	375	500

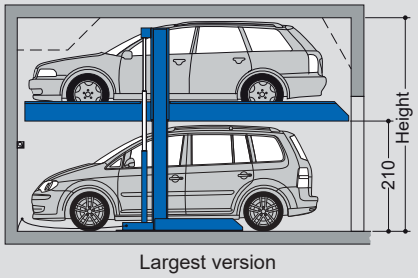
The snow loads apply to a snow height of 20 cm. For greater snow heights, the snow load must be cleared accordingly.

Height dimensions

All height variants can be found on page 2.



Smallest version

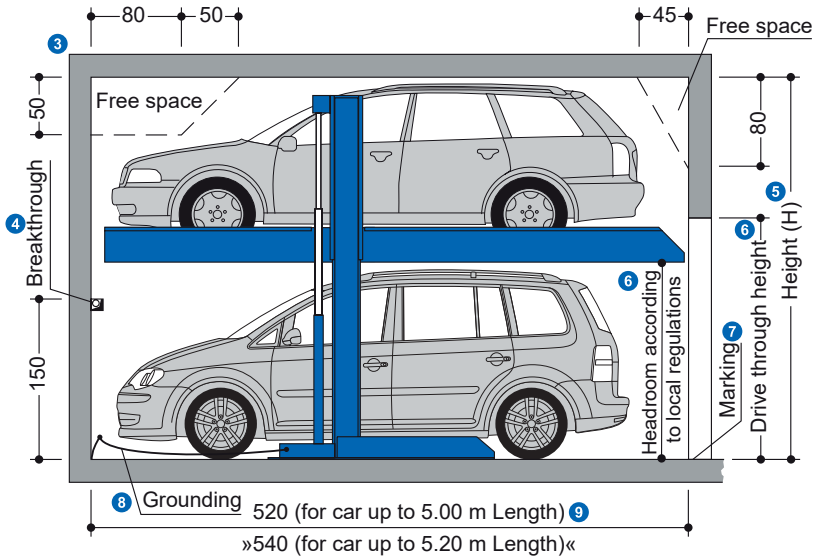


Largest version

▶ Specification

- EB (single platform) = 2 vehicles
- Car heights = 150 cm to 200 cm
- Car length = up to 520 cm
- **V2 (Standard) :** Load capacity = 2000 kg per parking place, Usable platform width up to 270 cm
- **V2-R (Reinforced) :** Load capacity = 2600 kg per parking place, Usable platform width up to 270 cm

▶ Garage without door



Before lowering the platform, the vehicle parked on the lower parking space must be driven off!

▶ Notes

(1) To comply with the minimum finished dimensions, the tolerances according to VOB, Part C (DIN 18330 and 18331) and DIN 18202 must also be considered.
(2) Car width for 230 cm platform width. For the greatest possible ease-of-use, we recommend
a) V2 - platform widths of 250 to 270 cm.
b) V2-R - platform widths of 260 to 270 cm.
(3) Outdoor installation: Three-sided barrier according to DIN EN ISO 13857. Depending on the location, can also be used as a windshield.
(4) For dividing walls: cutting through 10 x 10 cm.
(5) If a higher ceiling height is available, higher cars can be parked.
(6) Must be at least as high as the greatest car height + 5 cm.
(7) In compliance with DIN EN 14010, 10 cm wide yellow-black markings compliant to ISO 3864 must be applied by the customer to the edge of the pit in the entry area to mark the danger zone (see "**Load plan**", page 6).
(8) Grounding of the system to be connected to the central grounding on-site (to be provided by the customer).
(9) ■ 520 cm for vehicle length max. 5.0 m
■ 540 cm for vehicle length max. 5.2 m
Shorter versions are possible on request - observe local regulations on parking space lengths. We recommend a length of 540 cm for comfortable use of your parking space and also to accommodate longer vehicles.

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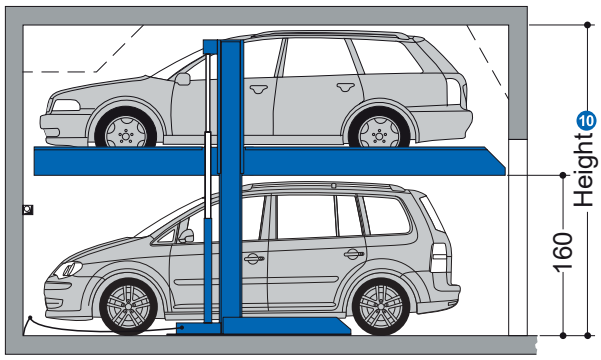
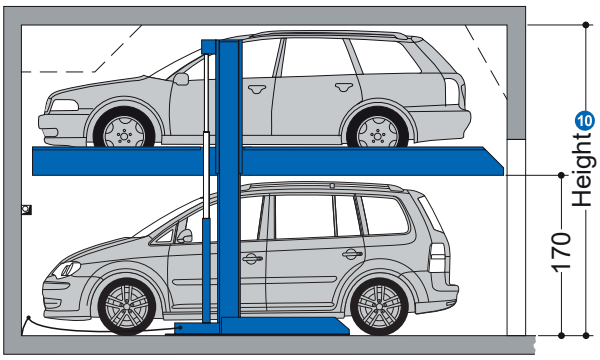
▶ Overview of stack parker varients and building heights

V2-160



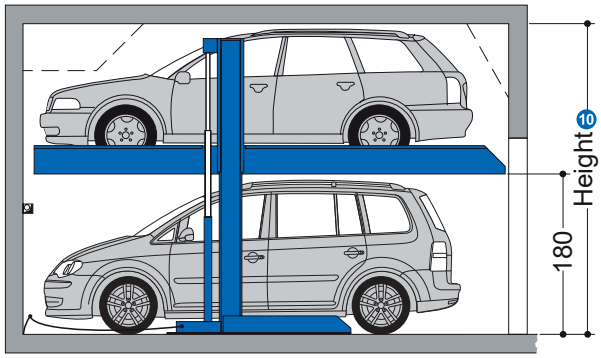
Height	Car height	
	top	below
320	150	150

V2-170



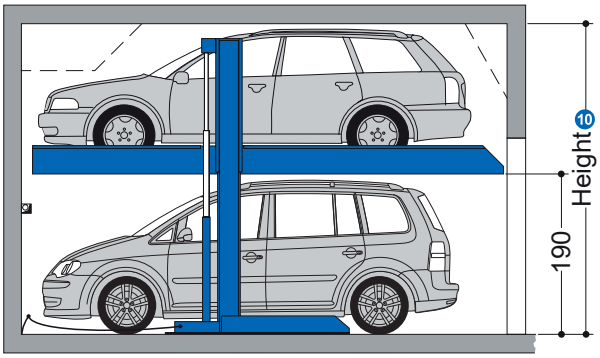
Height	Car height	
	top	below
330	150	160

V2-180



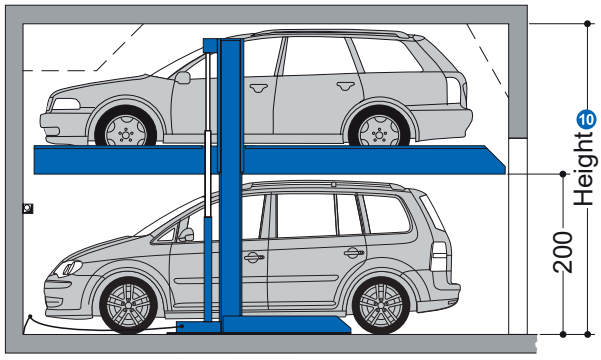
Height	Car height	
	top	below
340	150	170

V2-190



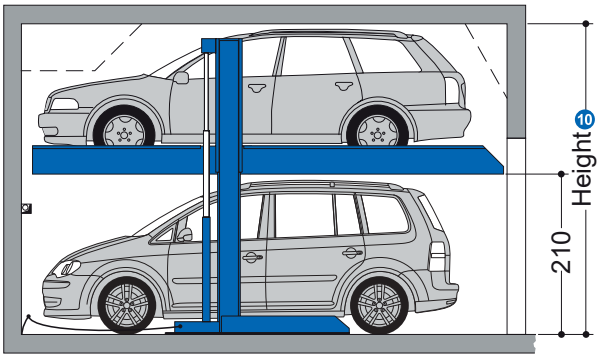
Height	Car height	
	top	below
350	150	180

V2-200



Height	Car height	
	top	below
360	150	190

V2-210



Height	Car height	
	top	below
370	150	200

⑩ If the ceiling height is higher, correspondingly higher vehicles can be parked on the top.

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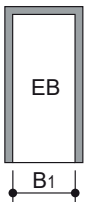
▶ Width dimensions for garage without door

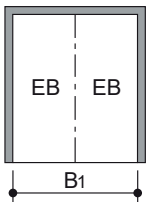
Dividing walls

Single platform (EB)



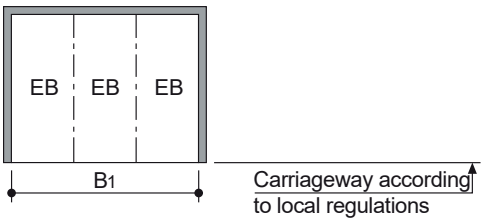
Usable platform width	Garage width **B1**
230	260
240	270
250	280
260	290
270	300

Double arrangement (2 x EB)



Usable platform width	Garage width **B1**
230	520
240	540
250	560
260	580
270	600

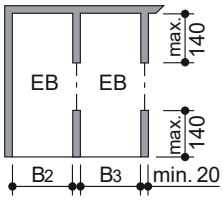
Triple arrangement (3 x EB)



Usable platform width	Garage width **B1**
230	780
240	810
250	840
260	870
270	900

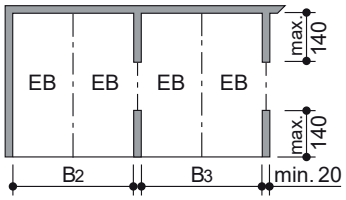
Columns in pit

Single platform (EB)



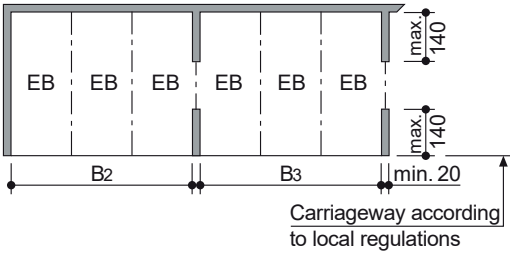
Usable platform width	Garage width	
	B2	**B3**
230	255	245
240	265	255
250	275	265
260	285	275
270	295	285

Double arrangement (2 x EB)



Usable platform width	Garage width	
	B2	**B3**
230	515	510
240	535	530
250	555	550
260	575	570
270	595	590

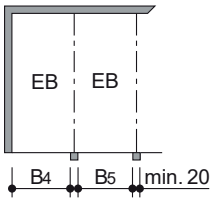
Triple arrangement (3 x EB)



Usable platform width	Garage width	
	B2	**B3**
230	775	770
240	805	800
250	835	830
260	865	860
270	890	890

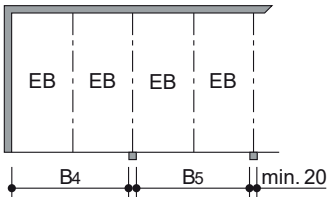
Columns outside pit

Single platform (EB)



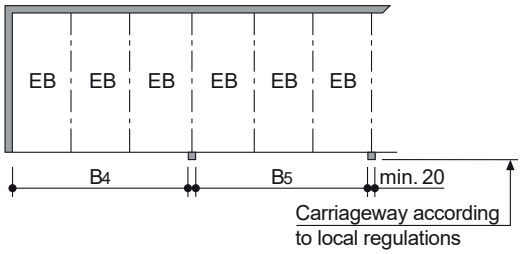
Usable platform width	Garage width	
	B4	**B5**
230	250	240
240	260	250
250	270	260
260	280	270
270	290	280

Double arrangement (2 x EB)



Usable platform width	Garage width	
	B4	**B5**
230	510	500
240	530	520
250	550	540
260	570	560
270	590	580

Triple arrangement (3 x EB)



Usable platform width	Garage width	
	B4	**B5**
230	770	760
240	800	790
250	830	820
260	860	850
270	890	880

HINT : End parking spaces are generally more difficult to drive into. Therefore, we recommend for end parking spaces our wider platforms. Parking on standard width platforms with larger vehicles is difficult. This depends on the type of vehicle, approach and above all on the individual driver´s skill. For maximum comfort, we generally recommend our maximum platform widths of 270 cm for a single platform.

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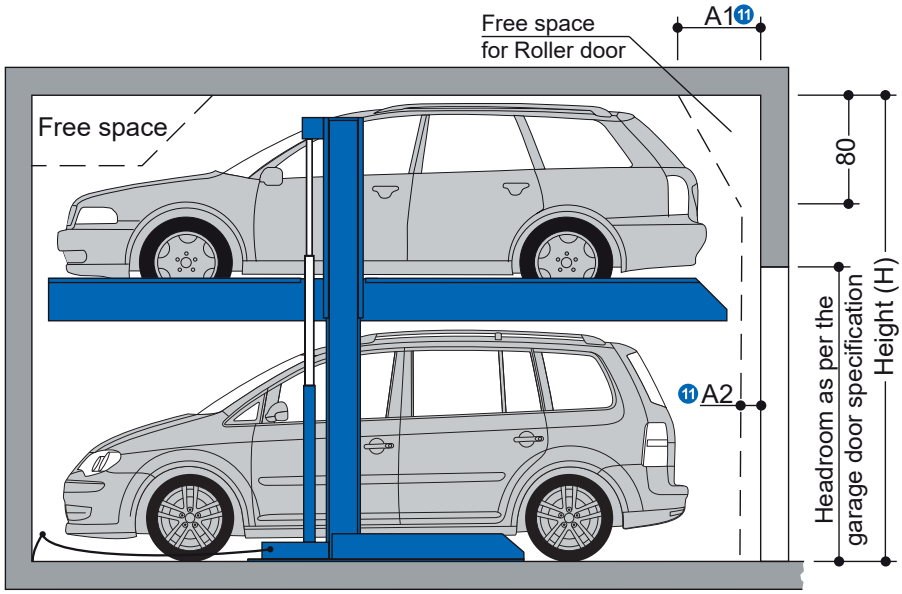
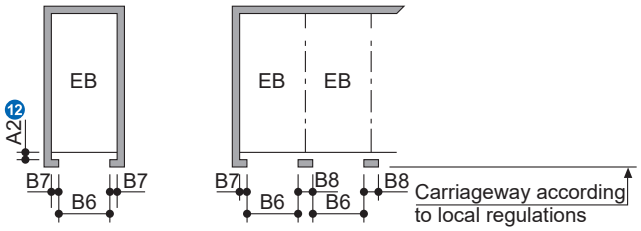
▶ Garage with door



11 Dimensions A1 and A2 must be coordinated with the door supplier.
For all-roller doors, coordination between the door manufacturer and **car stackers d.o.o** is necessary.

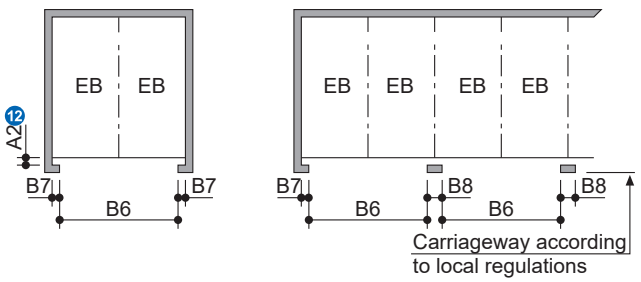
▶ Width dimensions for garage with door

Single platform (EB)



Usable platform width	Door entrance width **B6**	**B7**	**B8**
230	**230**	15	30
240	**240**	15	30
250	**250**	15	30
260	**260**	15	30
270	**270**	15	30

Double arrangement (2 x EB)



Usable platform width	Door entrance width **B6**	**B7**	**B8**
230	**490**	15	30
240	**510**	15	30
250	**530**	15	30
260	**550**	15	30
270	**570**	15	30

12 Dimensions A1 and A2 must be coordinated with the door supplier.
For all-roller doors, coordination between the door manufacturer and **car stackers d.o.o** is necessary.

HINT : End parking spaces are generally more difficult to drive into. Therefore, we recommend for end parking spaces our wider platforms. Parking on standard width platforms with larger vehicles is difficult. This depends on the type of vehicle, approach and above all on the individual driver´s skill. For maximum comfort, we generally recommend our maximum platform widths of 270 cm for a single platform.

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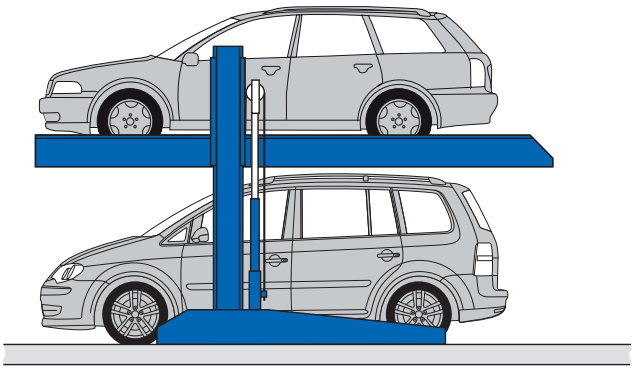
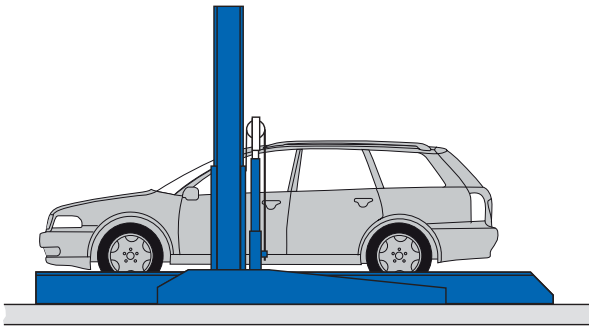
▶ Parking position

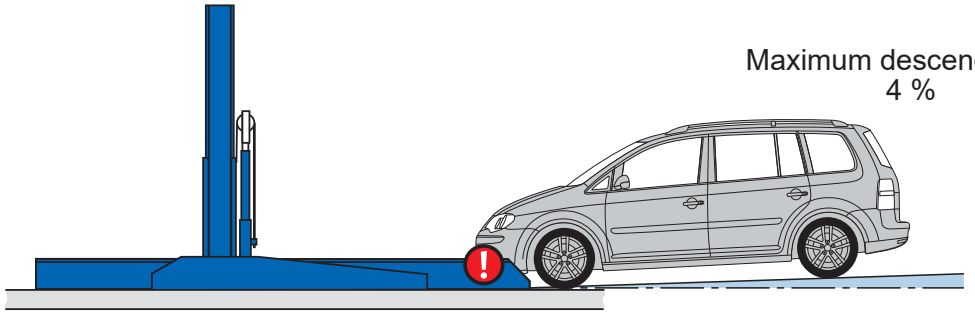
System raised

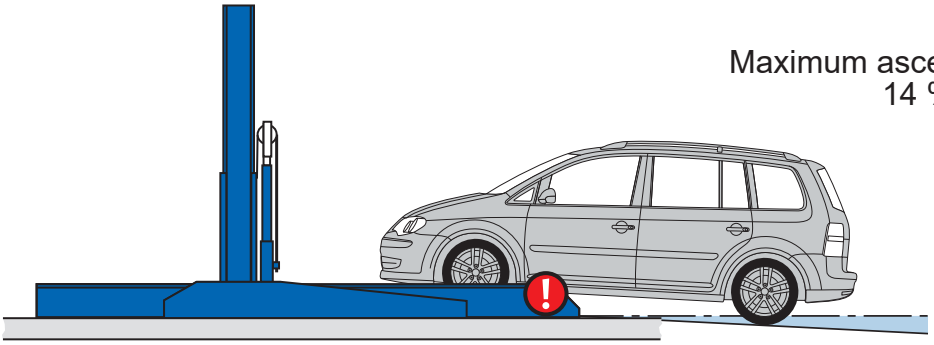


System lowered



▶ Approach

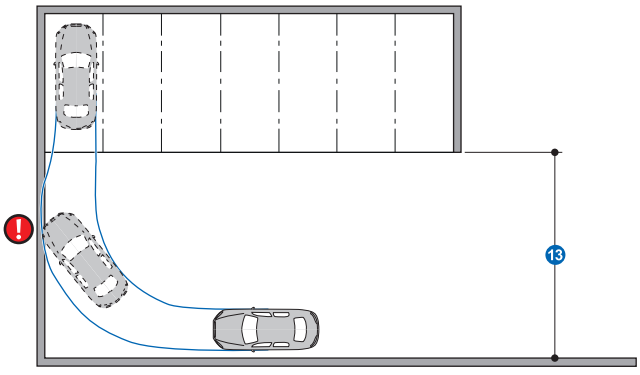




The illustrated maximum approach angles must not be exceeded.

Incorrect approach angles will cause serious maneuvering and positioning problems on the parking system for which the company **car stackers d.o.o** accepts no responsibility.

▶ Wall clearance



We recommend platform widths of a minimum of 250 cm and driving lane widths of 650 cm so that vehicles can comfortably enter and leave the **car stackers**-systems without difficulty

Narrower platforms may impede parking according to the following criteria.

- Driving lane width
- Entrance conditions
- Vehicle dimensions

⑬ Observe minimum driving lane width in accordance with local regulations!

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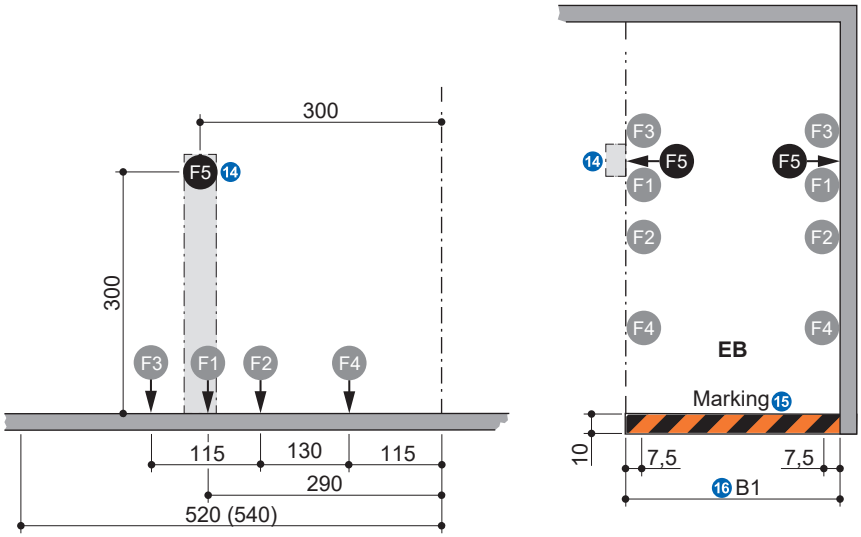
▶ Load plan

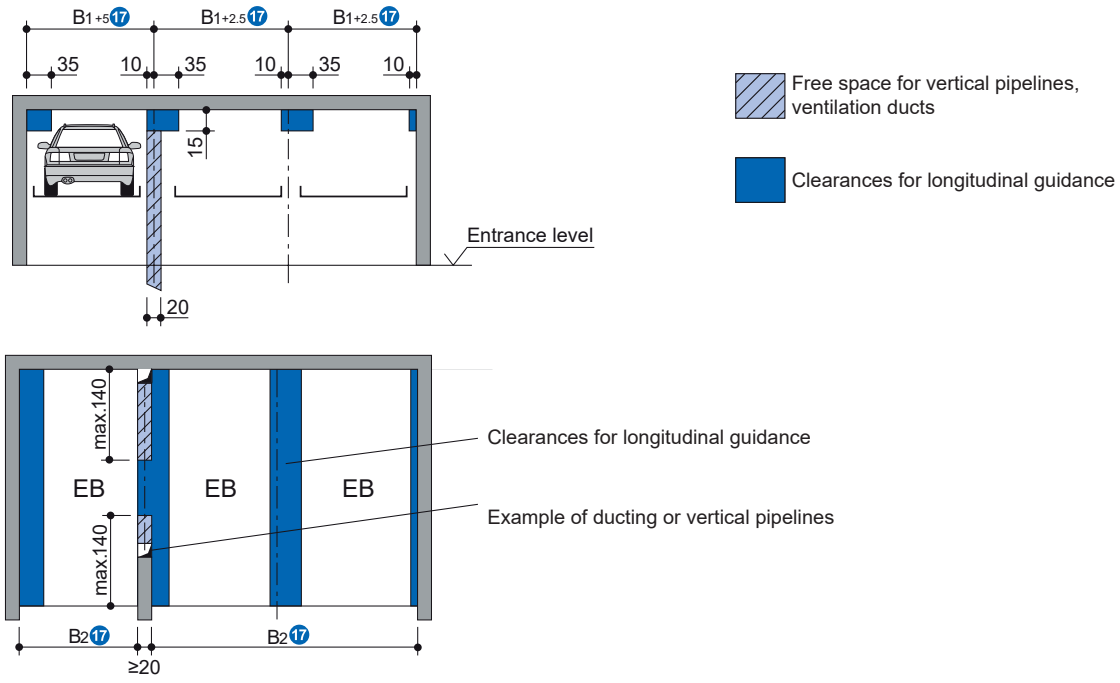
- The stack parker systems are anchored into the ground. The drill hole depth on the floor is approx. 15 cm, and on the walls approx. 12 cm.
- Floor and walls below the drive-in level must be made of concrete (concrete quality min. C20/25)!
- The dimensions of the load-bearing points are approximate. If the exact dimensions are required, please consult **car stackers d.o.o.**



Platform load	Force (kN)				
	F1	**F2**	**F3**	**F4**	**F5**
EB 2000 kg	+30	+0,5	+7,7	±0,8	±1
EB 2600 kg	+36	+0,7	+9,8	±1	±1

14 The system must be supported on both sides. An additional stand may be installed if there are no walls at the sides. A floor area of 50 x 30 cm is required for these standards (concrete quality min. C20/25, drill hole depth approx. 15 cm).
15 Marking in accordance with DIN EN 14010 (illustration colours are not consistent with DIN ISO 3864)
16 Width dimension B1 (see **"Width dimensions for garage with/without door"**, Page 3 and 4)

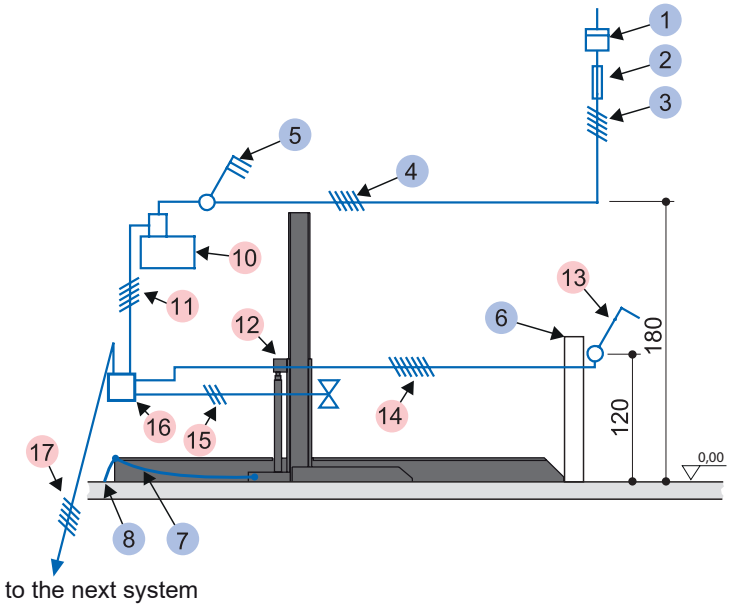
▶ Space for duct installation



HINT : Free spaces apply only to forward parked cars with driver exit on the left side!

17 Dimensions B1 and B2, see **"Width dimensions for garage without door"**, page 3.

▶ Electrical installation



Electrical data to be performed by the customer

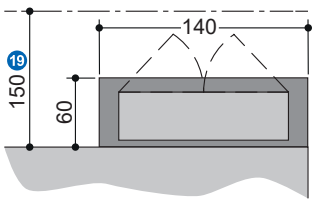
No.	Qty.	Description	Postion	Frequency
1	1	Electricity meter	in the supply line	
2	1	Main fuse: 3 x fuse 16 A (slow) or circuit breaker 3 x 16 A (trigger characteristic K, G or C)	in the supply line	1 per unit
3	1	Supply line 5 x 2.5 mm² (3 PH + N + PE) with marked wire and protective conductor (18)	to main switch	1 per unit
4	1	Supply line 5 x 2.5 mm² (3 PH + N + PE) with marked wire and protective conductor	from main switch to unit	1 per unit
5	1	Lockable main switch	defined at the plan check	1 per unit
6	1	Operating stand		1 per system
7	1	Potential equalization from foundation grounding connection system according to DIN EN 60204		1 per system
8	every 10 m	Foundation earth connector	corner pit floor	
9	2	Empty pipe EN 25 (M25)		1 per system

Electrical data included in delivery of **car stackers d.o.o**

No.	Designation
10	Hydraulic unit 3,0 kW, three phase current, 230/400 V, 50 Hz
11	Control cable 5 x 1.5 mm² with marked wires and protective earth
12	Chain monitoring
13	Operating element
14	Control cable 7 x 1.5 mm² with marked wires and protective earth
15	Control cable 3 x 0.75 mm² (PH+N+PE)
16	Junction box unit
17	Control cable 5 x 1.5 mm² with marked wires and protective earth to next system

(18) If the hydraulic unit is in the cabinet: The customer must provide the cable routing to the foundation of the hydraulic unit.

▶ Detail building construction – foundation hydraulic unit



If the installation of the hydraulic power pack is not possible in adjacent room or building, the hydraulic power pack and the electrical components must be accommodated in a cabinet (at an additional cost).

The cabinet is to be planned in the rear area of the stack parker. For this purpose, a foundation (140 x 60 cm) made of concrete is required (concrete quality min. C20/C25). The cabinet is doweled into the floor. The drill hole depth is approx. 10 cm.

(19) Free space

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▶ Technical hint

Usage area
As a standard, the system is suitable for long-time car parking. Frequent usage of upper parking space (e.g., short-term parking in office buildings or hotels) requires structural modifications to the **car stackers** system. Feel free to contact us for consultation.

Units
Low-noise hydraulic units mounted on Anti-vibration mounting plates are installed. But, we also recommend separating the garage body from the residential building. If it is not possible to install the hydraulic unit in adjacent buildings or rooms, the hydraulic unit and the electrical components must be housed in a cabinet (at an additional cost) (see **"Detail building construction – foundation hydraulic unit"**, page 7).

Railings
If the permissible drop opening is exceeded, railings are to be mounted on the systems. If there are traffic routes next to or behind the installations, railings compliant to DIN EN ISO 13857 must be installed by the customer. Railings must also be in place during construction.

CE certification
The systems offered correspond to DIN EN 14010 and the EC Machinery Directive 2006/42/EG.

Building application documents
According to LBO and GaVo (garage regulations), the **car stackers** systems are subject to approval. Please observe the local rules and regulations.

Available documents
- Wall recess plans
- Maintenance offer/contract
- Declaration of conformity

Environmental conditions
Ambient conditions for the areas around stack parker systems:

- Temperature range -10 °C to +40 °C
- Relative humidity of 50% at a maximum outside temperature of +40 °C.

The lifting and lowering of stack parker systems are calculated at an ambient temperature of +10 °C and with the hydraulic system positioned immediately adjacent to the stack parker. The operating time of stack parker increases at lower ambient temperatures or with longer hydraulic lines.

Care & Protection
To avoid corrosion damage, please follow separate cleaning and care instructions (as per the **"Corrosion protection"** sheet) and ensure that your garage is well ventilated.

Noise protection
Standard noise protection:
As per DIN 4109-1 (Sound insulation in buildings – Part 1: Minimum requirements) - Section 9:
- Maximum noise level in living and sleeping areas 30 dB (A).

Noise created by users are not considered.

The following dimensions are required for adherence to this value:
- Noise protection package in accordance with quote/order (**car stackers d.o.o**).
- Noise insulation dimension of the building structure of minimum weighted sound reduction index, min. R'w = 57 dB (service to be provided by the customer)

Increased noise protection (special agreement):
As per DIN 4109-5 (Sound insulation in buildings - Part 5: Increased requirements) - Section 8:
- Maximum noise pressure level in living and sleeping areas 25 dB (A).

Noise created by users are not considered.

The following dimensions are required for adherence to this value:
- Noise protection package in accordance with quote/order (**car stackers d.o.o**).
- Noise insulation dimension of the building structure of min. R'w = 62 dB (service to be provided by the customer)

HINT : User noises are the noises that can be influenced by individual users of our **car stackers** systems. These are created during the accessing of the platform, slamming of vehicle doors, engine, and brake noise.

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▶ Facilities to be provided by the customer

Safety barriers
During the stack parker construction, in accordance with DIN EN ISO 13857, safety barriers are to be placed immediately in front of, adjacent to, or behind the systems where there are roadways.

Parking space numbering
Parking space numbering, if required.

Building services
Ventilation, fire extinguishing and fire alarm systems, as well as clarification and compliance with the relevant regulatory requirements.

Lighting
The customer must observe local regulations pertaining to the illumination of parking spaces and roadways. In accordance with DIN EN 12464-1 'Light and lighting - Lighting of work places', an illumination level of min. 200 lx is recommended for the parking spaces and operating area of the system.

Warning labels
In accordance with DIN EN 14010, the customer must provide 10 cm wide, yellow/black marking in accordance with DIN ISO 3864 in the access area in front of the contact area of the upper platform edge to identify the hazard area (see **"Load plan"**, Page 6)

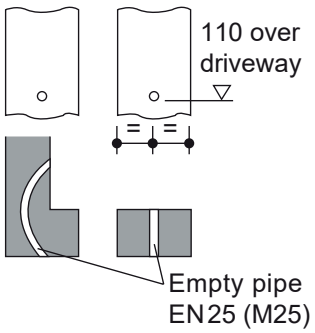
Wall cutout
Any necessary wall cutout according to page 1.

Electrical supply to the main switch / Foundation earth connector
The customer must lay the supply cable to the master switch during assembly. Functional capability can be checked by our engineers on site, in conjunction with the electrical engineer. If this is not possible during assembly for reasons attributable to the customer, the customer must commission an electrical engineer.

The customer must earth the steel structure with a foundation earth connection (earthing distance max. 10 m) and equipotential bonding in accordance with DIN EN 60204 (see **"Electrical installation"**, page 7)

Control panel
Empty conduits and recesses for the operating element (see **"Electrical installation"**, page 7). Consultation with **car stackers d.o.o** is required when using folding doors.

Control panel on plaster



Other services on-site
- Measures for the implementation of water protection regulations
- Measures to comply with fire protection regulations and noise protection in accordance with DIN4109
- Daily update on project photos, if required.
- Foundation grounding if necessary
- All permits and approvals

If the following are not included in the quotation, they will also have to be provided/paid for by the customer:
- Mounting of contactor and terminal box to the wall valve, complete wiring of all elements in accordance with the circuit diagram
- Costs for final technical approval by an authorized body
- Main switch
- Control line from main switch to hydraulic unit
- Railing
- Floor marking

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▶ Description

General description

- **car stackers d.o.o** stack parker system provides parking space for two vehicles on top of the other. The lower vehicle is parked directly on the floor. The lower vehicle must exit the stack parker system before the platform is lowered.
- The height of the platform can be flexibly adjustable (also after installation).
- Increased load capacity to 2600 kg is subsequently possible.
- Dimensions according to the underlying pit, width and height dimensions.
- Access to the parking spaces horizontally (installation tolerance ± 1%).
- Vehicles are positioned on the upper parking space using wheel stops on the right side (adjust according to operating instructions).
- Control via an operating element with automatic reset by means of a master key.
- Operating elements are usually installed in front of the support or on the outside of the door.
- Operating instructions are attached to each operator‘s stand.
- For garages with doors at the front of the parking system, the special dimensional requirements have to be taken into account.

Car Stackers system consisting of:

- 2 Pillars with foundation rails (fixed to the floor)
- 2 Sliding pieces (with sliding guides attached to the pillars)
- 1 Platform
- 1 mechanical synchronization system (for the synchronous operation of the hydraulic cylinders during lifting and lowering)
- 1 Hydraulic cylinder
- Dowels, screws, fasteners, connecting elements etc.
- The platforms/parking spaces are continuously accessible.

Platform consisting of:

- Platform profiles
- Adjustable positioning aids
- Bevelled bumpers
- Lateral beams
- Cross beams
- Screws, nuts, spacer tubes, etc.

Hydraulics consisting of:

- Hydraulic cylinder
- Solenoid valve
- Safety valves
- Hydraulic lines
- Hydraulic fittings
- High-pressure hoses
- Mounting material

Electrical system consisting of:

- Operating element (Emergency-stop, lock, 1 master key per parking space)
- Junction box unit
- Electrical locking device
- Chain monitoring system

Hydraulic unit consisting of:

- Hydraulic unit (low noise, installed onto a console with a rubber-bonded-to-metal mounting)
- Hydraulic oil tank
- Oil filling
- Internal gear pump
- Pump holder
- Coupling
- Three-phase motor (3.0 kW, 230/400 V, 50 Hz)
- Pressure gauge
- Pressure relief valve
- Hydraulic hoses (to reduce noise transmission to the hydraulic pipes)

We reserve the right to change these specifications without notice!

car stackers d.o.o reserves the right, in the course of technical and technological progress, to use newer or different technologies, systems, processes, procedures, or standards than those originally offered and ensure that the customer does not incur any disadvantage.

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