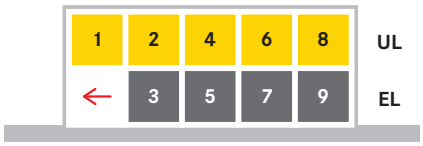
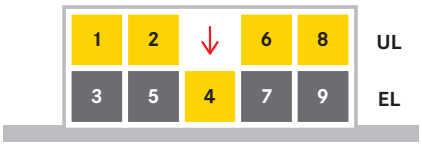
Data Sheet
WÖHR COMBILIFT 551

- **Platform load options:**
  - max. 2000 kg, load per wheel 500 kg
  - max. 2600 kg, load per wheel 650 kg
- **Platforms are in horizontal position to drive on**

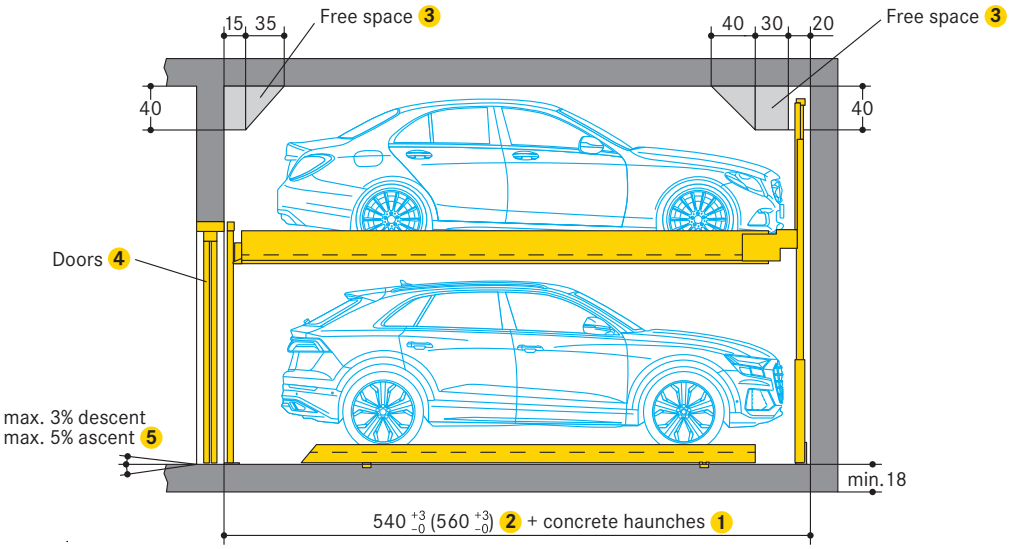


The parking places 3 and 5 are shifted to the left.



UL parking place no. 4 can be lowered.

Length dimensions underground car park (height dimensions see page 2)



1. Channels or undercuts/concrete haunches (performed by the customer):
   - not allowed along the floor-to-wall joints
   - should channels or undercuts be necessary, the system width needs to be reduced or the pit needs to be wider
2. 500 cm vehicle length = 540 cm installation length

   520 cm vehicle length = 560 cm installation length

   Due to the increasing length of vehicles, we recommend an installation length of 560 cm in order to be able to park mid-range models in the future.
3. Free spaces:
   - please ask WÖHR for the dimension sheets
4. Doors (see page 5)
5. For above ground garages with a slope, a drainage channel in the driveway is recommended

Dimensions

- all dimensions specified are the minimum, finished dimensions
- tolerances must be taken into consideration
- all dimensions are given in cm

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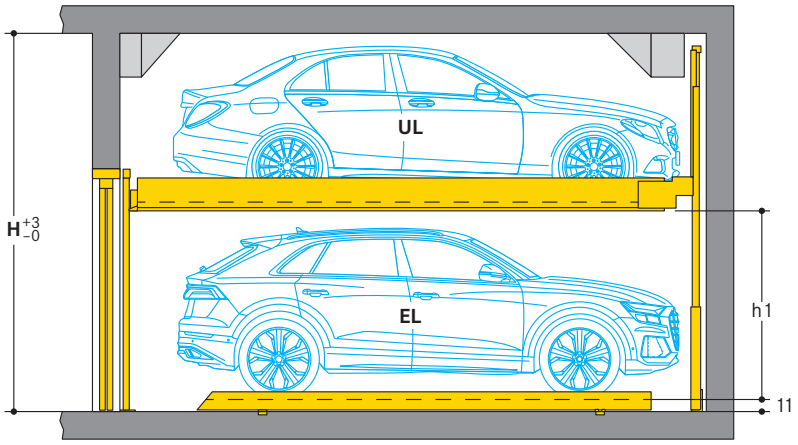
Height dimensions



Type	Height H	Height h1	Vehicle height	
			UL (upper level)	EL (entrance level)
551-180	**380**	**180**	**175**	**175**
551-205	**430**	**205**	**200**	**200**
	405	**205**	**175**	**200**
551-210	**440**	**210**	**205**	**205**
551-170	**360**	**170**	**165**	**165**
	345	**170**	**150**	**165**
551-155	**330**	**155**	**150**	**150**

Passenger car registrations in Germany*

Orientation aid for height dimensions: With a system type from the table above, which for example covers cars up to 175 cm in height, 92.81 % of all cars registered new in 2022 in Germany can be parked.

Height	Examples of models	Passenger car registrations
143,5	Opel Corsa	33,27 % — up to 150 cm*
144,1	VW Passat	
147,3	Audi A8	
161,5	VW ID.5	91,25 % — up to 170 cm*
166,8	BMW iX3	
168,1	Skoda Kodiaq	
171,2	Audi Q7	92,81 % — up to 175 cm*
171,8	Mercedes Benz EQS SUV	
172,7	Volvo XC90	
177,8	Ford Explorer	93,76 % — up to 180 cm*
179,7	Mercedes Benz GLE	
179,7	VW Caddy Kombi	
188,0	VW Amarok	99,27 % — up to 205 cm*
191,4	Land Rover Defender	
193,8	VW ID.Buzz	

* Due to different equipment, vehicles of the same design may have different heights. The maximum heights have been taken into account.
Source: German Federal Motor Transport Authority, 2022 (evaluation for motor vehicles registered in Germany for passenger transport with up to 9 seats).

Decision support for the vehicle height

Choosing the right vehicle height for your project is essentially based on any building regulations, user expectations and building specifications. Criteria can include:

Residential buildings:
Different parking space heights are conceivable and can affect the sales price. For example, lower parking spaces could be provided for higher vehicles. This results in more convenient access to the vehicle. Less high vehicles in the upper parking spaces and thus reduced building height and less enclosed space. The ramp to the underground car park will be less steep or less long. To make it easier to sell and use parking spaces, we recommend that the vehicle heights be the same.

Office buildings:
For this parking concept, we recommend the same vehicle height for all parking spaces. If permanently assigned parking spaces are preferred for parking permittees, different parking space heights could be provided.

Hotels:
Whether city hotel, vacation hotel or vacation apartments: With changing occupancy, all parking spaces should have the same vehicle height. Maximum parking space heights should be selected to allow parking for vehicles with roof-mounted structures, if necessary.

Configuration example residential buildings

Vehicle height UL	**175 cm**
Vehicle height EL	**175 cm**

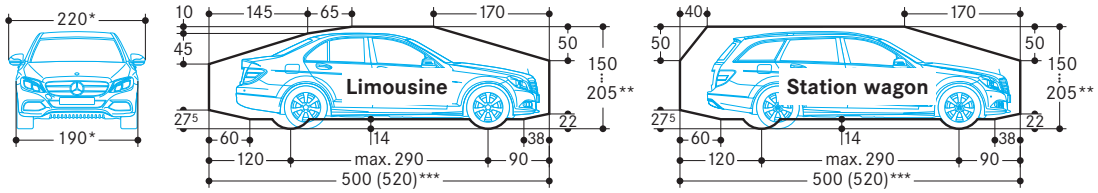
Type	Height	Height	Vehicle height	
	H	h1	UL (upper level)	EL (entrance level)
551-180	**380**	**180**	**175**	**175**

Configuration example office building and hotels

Vehicle height UL	**205 cm**
Vehicle height EL	**205 cm**

Type	Height	Height	Vehicle height	
	H	h1	UL (upper level)	EL (entrance level)
551-210	**440**	**210**	**205**	**205**

Clearance profile (for standard vehicles)



* for a 250 cm platform width

** The overall vehicle height including roof luggage rails an antenna mounts must not exceed the max. vehicle height dimensions specified

*** see page 1

Width dimensions

Platform widths:

250 cm:
– for 190 cm vehicle width (without outside mirror)

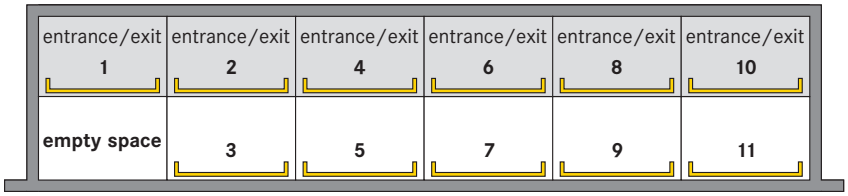
260–270 cm:
– for vehicles wider than 190 cm (without outside mirror)

270 cm:
– for units at the end of the driving aisle

For comfortable parking, entry and exit conditions platform widths of 270 cm are recommended.
Reduced platform width means reduced parking comfort depending on the vehicle width, vehicle type, individual driving style, access situation of the (underground) garage.

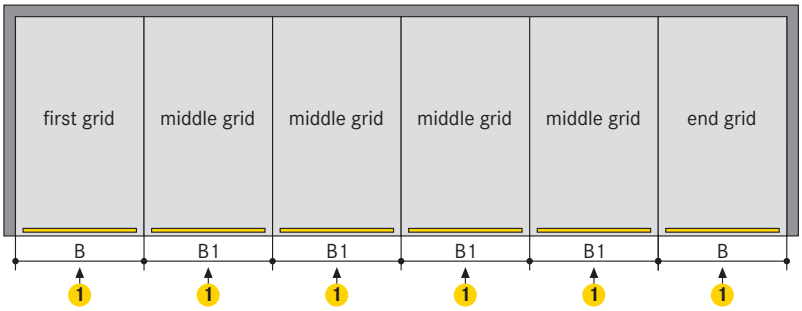
With a 90° arrangement of the parking places, we recommend widening the driving aisle to at least 700 cm or a wall recess (see below).

Width dimensions (underground car park)



UL (upper level) 2

EL (entrance level) 1 2



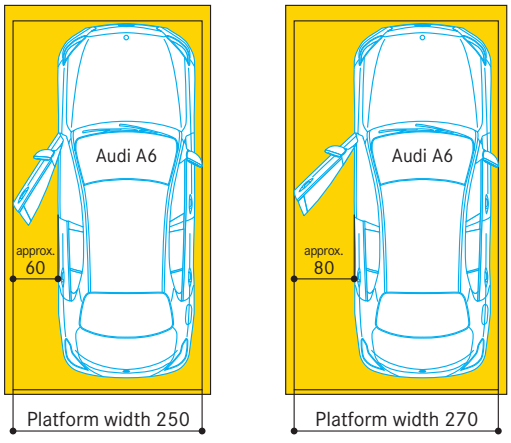
Space requirements		clear platform width upper level	clear platform width entrance level
B	B1		
260	250	230	207
270	260	240	217
280	**270**	**250**	**227**
290	**280**	**260**	**227**
300	**290**	**270**	**227**

1 One entry/exit is required on entrance level (EL) for each grid

2 For a comfortable parking process and comfortable conditions for getting in and out of the car, we recommend platform widths of 270 cm. Smaller platform widths are possible but not recommended (please contact WÖHR).

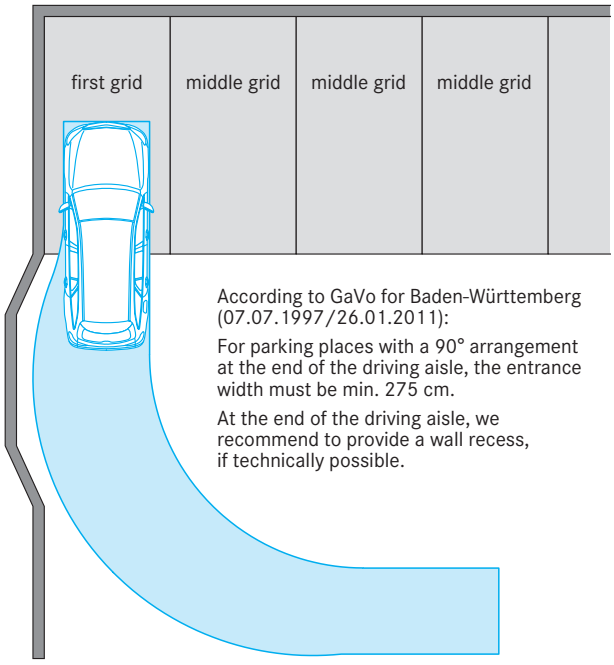
3 It is not possible to combine different platform widths

Door opening dimensions



Depending on the vehicle model and the parking position of the vehicle on the platform, the space for opening the door varies. For comfortable conditions for getting in and out of the car, we recommend platform widths of 270 cm.

Wall recess



According to GaVo for Baden-Württemberg (07.07.1997/26.01.2011):

For parking places with a 90° arrangement at the end of the driving aisle, the entrance width must be min. 275 cm.

At the end of the driving aisle, we recommend to provide a wall recess, if technically possible.

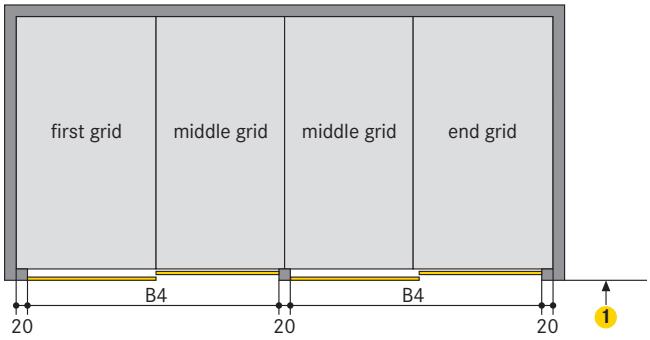
Doors

According to DIN EN 14010 doors are required.

Automatic sliding doors:
- electrical drive
- controls are integrated in the overall system
- electro-mechanically interlocked
- can only be opened when the selected parking place has reached the entry/exit position
- any crash openings are closed in the entrance area

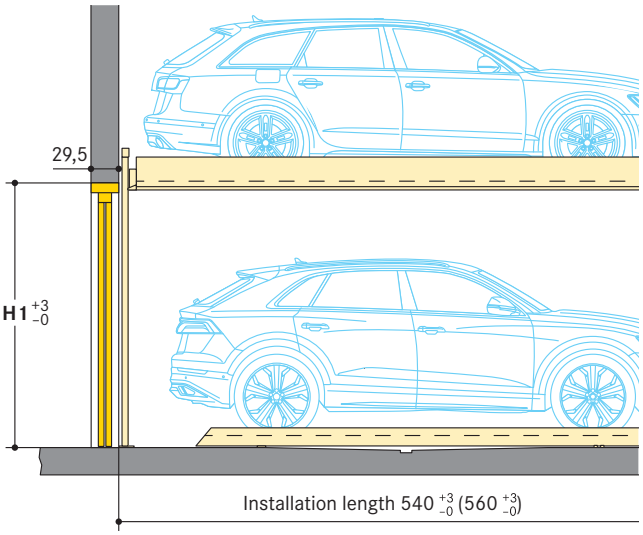
Local requirements for electrical doors regarding the technology, maintenance and revision are not subject of our delivery. These matters have to be observed and carried out by the customer, according to the local regulations.

Sliding doors below the lintel between the building pillars



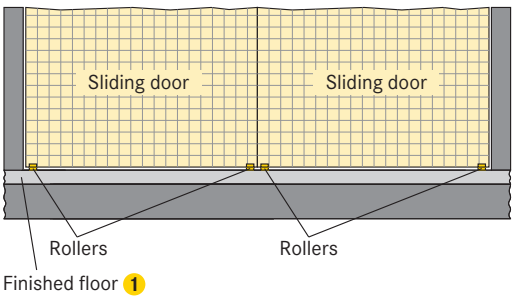
Space requirements B2	clear platform width
480	230
500	240
520	**250**
540	**260**
560	**270**

1 The driving aisle width must comply with local regulations



	Vehicle height EL (entrance level)				
	150	**165**	**175**	**200**	**205**
H1	220	220	220	220	220

Sliding door floor guides



1 Finished floor:
- compliant to DIN 18353,
- floor evenness compliant to DIN 18202, table 3, line 3

2 Floor guide section:
- base plate with plastic rollers
- fixed on the floor with adhesive anchor (M8 internal screw thread)
- borehole depth approx. 9 cm
- in the event that floor filling needs to be laid into the door section to the purpose of reaching the required floor evenness, the borehole depth needs to be increased by the thickness of the floor fill (max. 4 cm)

3 If the driving aisle is made of concrete blocks, asphalt etc., the concrete slab in the door area must be min. 29,5 cm wide

Evenness tolerances

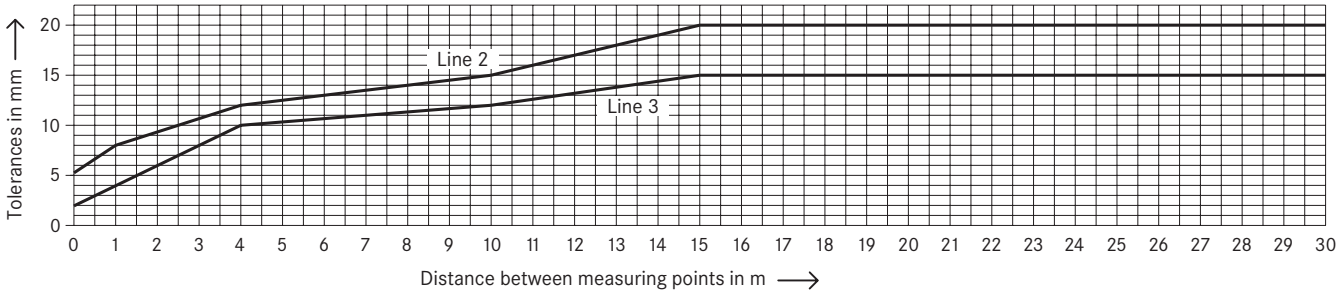
According to DIN EN 14010, the safety clearance between the outer lower edges of the parking platforms and the garage floor must not exceed 2 cm.

In order to comply with the requirement and to obtain the necessary floor level, the tolerances of the evenness of the finished floor cannot be exceeded according to DIN 18202, table 3, line 3. Therefore, exact levelling of the floor by the customer is essential.

Abstract from DIN 18202, table 3

Column	1	2	3	4	5	6
		Vertical measurements as limits in mm with measuring points distances in m to*				
Line	Reference	0,1	1	4	10	15
2	Unfinished to surface of covers, subconcrete and subsoils for higher demands, e.g. as foundation for cast plaster floor, industrial soils, paving tiles and slabstone paving, compound floor paving. Finished surfaces for minor purposes, e.g. warehouses, cellars	5	8	12	15	20
3	Finished grounds, e.g. floor pavement serving as foundation for coverings. Coverings, tile coverings, PVC flooring and glued coverings.	2	4	10	12	15

* Intermediate values are to be taken out the diagram and must be rounded-off to mm.



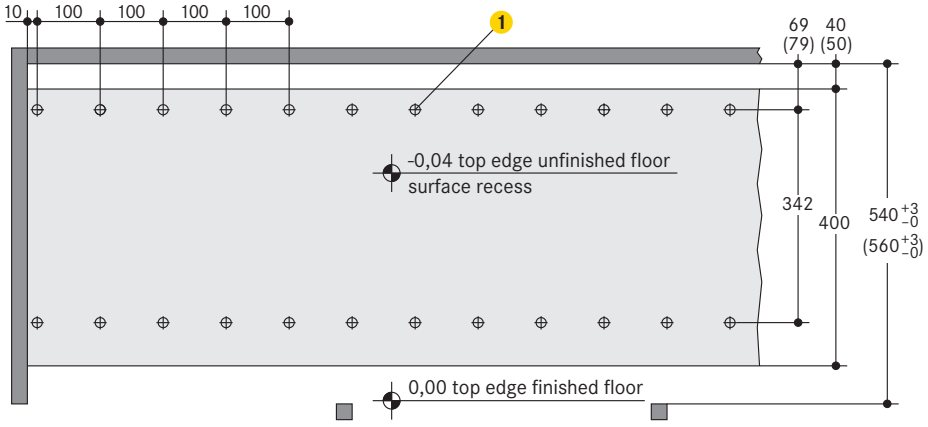
Check points

The evenness of a surface is checked independently of its position and slope by bore hole gauges between two check points on the surface. WÖHR normally make a random test using single measurements in case of obviously inaccurate surfaces.

For uniform examination of the evenness of the ground surface the following points are defined as measuring and check points:

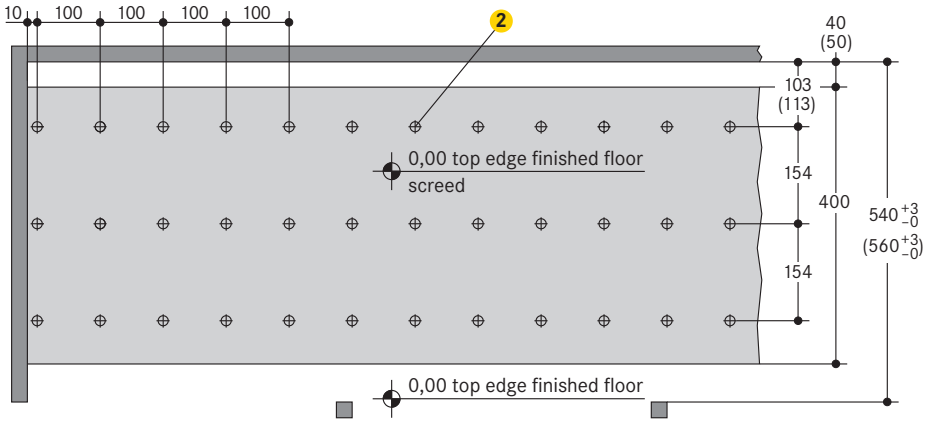
a) for surface recess.
b) for finished floor.

a) Layout for surface recess width 4 m



1 Measuring points at 100 cm points for checking the unevenness acc. to DIN 18202, table 3, line 2, or acc. diagram

b) Layout for finished floor after placing floor pavement



2 Measuring points at 100 cm points for checking the unevenness acc. to DIN 18202, table 3, line 3, or acc. diagram

Track and floor construction | Drainage

Track load due to a moving traffic load per roller:
- for platform load 2000 kg max. 6 kN
- for platform load 2600 kg max. 10 kN

The evenness of the unfinished floor must be carried out in accordance with DIN 18202, Table 3, line 2.

The levelling rails are installed after checking the unfinished floor from the highest point.

The underlining and fixing of the levelling rails occurs at the intended fixing points.

For the laying of the running and levelling rails a meter tear is to be attached permanently for every railway track provided by the customer.

The screed is to be peeled off by the client on height of the levelling rails.

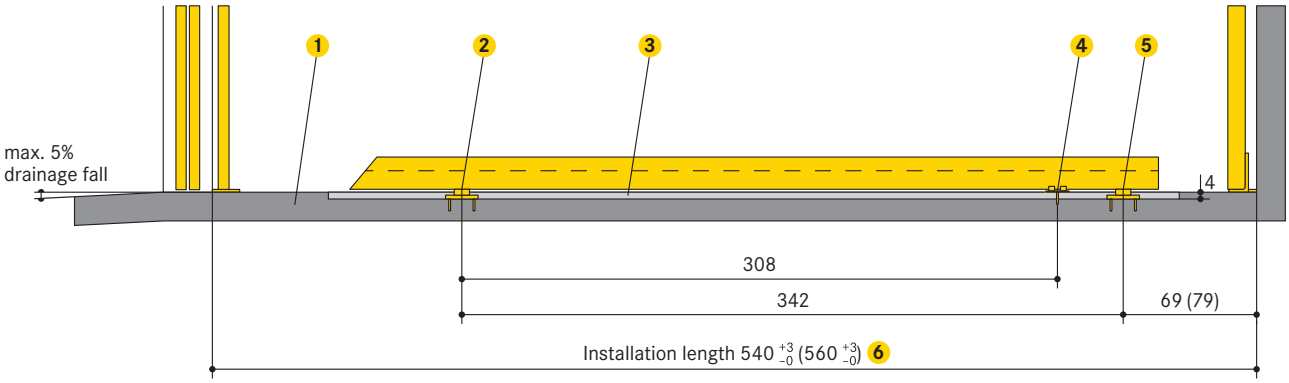
Do not use mastic asphalt.

The running and guide rails are fastened after placement of the screed with bolts.

Evenness according to DIN 18202, table 3, line 3.

In the area of the railway track no expansion gap or building dividing gaps are allowed.

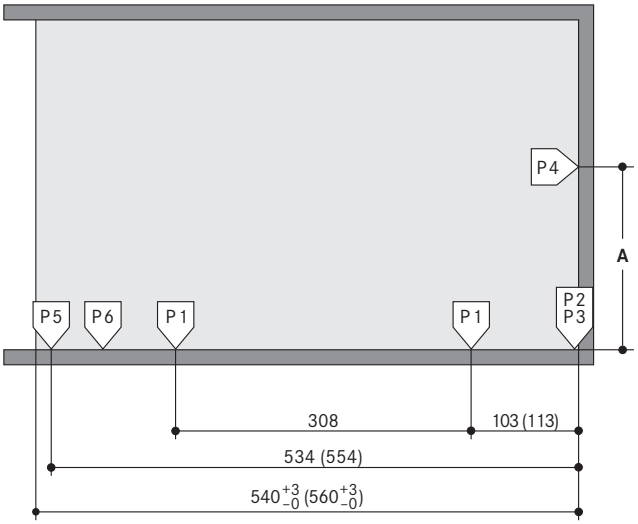
Due to the technical requirements there is no drainage fall allowed in the area of the system.



1. Unfinished floor
2. Running and levelling rail
3. Finished floor acc. to DIN 18202, table 3, line 3
   4 cm screed
4. Running and guide rail
5. Levelling rail
6. In this area no drainage fall in cross or longitudinal direction is allowed

Static calculations and construction works requirement

Section



Type	A
552-155	178
552-170	193
552-180	203
552-205	228
552-210	233

551 (2000 kg)	
P1	+ 6,0 kN*
P2	– 10,0 kN
P3	+ 25,0 kN
P4	± 1,0 kN
P5	+ 9,0 kN – 7,0 kN
P6	± 1,0 kN

551 (2600 kg)	
P1	+ 10,0 kN*
P2	– 12,0 kN
P3	+ 41,0 kN
P4	± 5,0 kN
P5	+ 12,0 kN – 10,0 kN
P6	± 3,0 kN

*specified load bearing data includes the vehicle weight

Fixing of the system frames to the floor slab:
- using base plates (approx. 350 cm²)
- using adhesive anchor bolts
- hole depth to 12–14 cm
- bottom plate in concrete
- thickness of bottom plate min. 18 cm

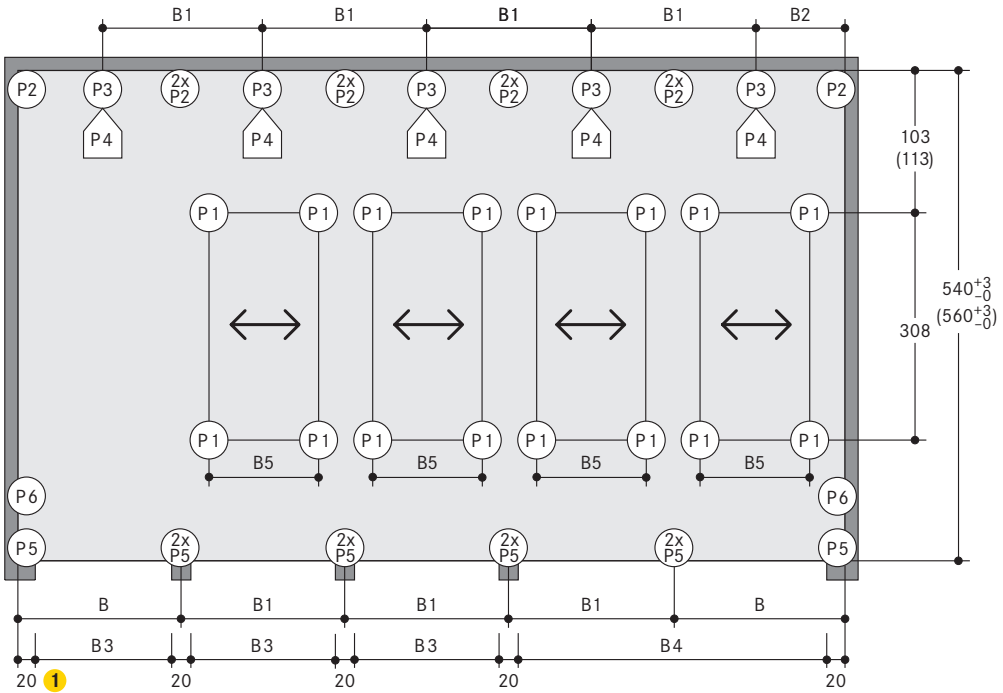
Fixing of the system frames to the walls:
- with walls plates (approx. 30 cm²)
- using adhesive anchor bolts
- hole depth to 12–14 cm
- front drive-in wall and rear wall in concrete
- perfectly flat wall surfaces
- without protruding sections such as border edgings, pipes and tubes, etc.
- thickness of walls min. 18 cm

Concrete quality grade:
- compliant to the static requirements of the construction
- min. C20/25 grade (for dowel fastening)

Frame bearing points:
- the specified lengths are expressed as mean value
- for the exact data, specific TÜV-tested data sheets are available

Door widths/widths of columns:
- please contact WÖHR
- grid width (250/260/270/280/290) must be observed

Ground plan

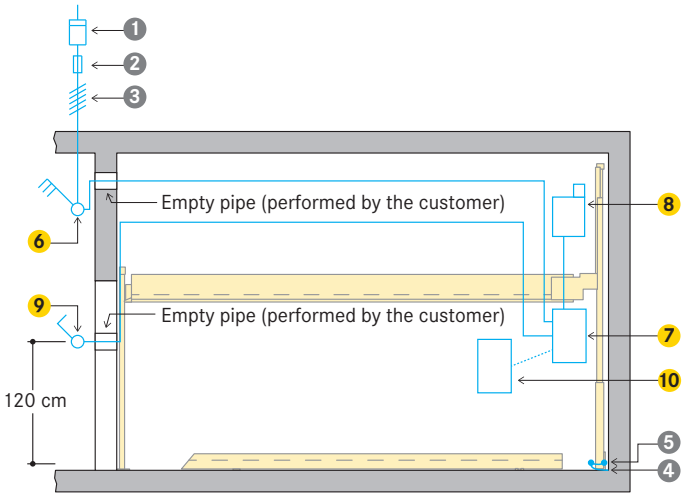


Space requirements B	B1	B2	B3	B4	clear platform width entrance level B5	clear platform width upper level
260	250	135	230	480	207	230
270	260	140	240	500	217	240
280	**270**	**145**	**250**	**520**	**227**	**250**
290	**280**	**150**	**260**	**540**	**227**	**260**
300	**290**	**155**	**270**	**560**	**227**	**270**

1 If the width of the pillars is more than 20 cm, than the width of the drive through will be reduced accordingly to the above mentioned width dimensions (B and B1). In order to avoid this, we recommend to extend the measures between the pillars (B3 and B4) accordingly. Please contact WÖHR.

Electrical specifications

Installation diagram



Cabling preparation to be performed by the customer:

- up to the main switch to be in place prior to starting the installation operations
- connection to the main switch during installation
- clockwise rotating field must be applied
- system functional check testing can be performed by WÖHR together with the electrician provided by the customer
- if requested at a later date, functional check testing can be performed by WÖHR at extra-cost

Grounding and potential equalisation (to be performed by the customer):

- compliant to DIN EN 60204
- connections required every 10 metres

To be performed by the customer

Item	Quantity	Description				Position
1	1 piece	Power meter			In the feed cable	
2	1 piece	Fuse protection or automatic circuit breaker:*			In the feed cable	1 x per system
		Motor	**Starting current**	**Fuse protection**	**Platform load**	
		3,0 kW	24 A	3 x 16 A (11 kW)	2000 kg/2600 kg	
3	Based on site conditions	Compliant to local power supply regulations 3 phases + N + PE* 230/400 V, 50 Hz			Feed cables to main switch including connection	1 x per system
4	Every 10 m	Grounding and potential equalisation lead-out connection			Along floor edges/rear wall	
5	1 piece	Grounding and potential equalisation compliant to DIN EN 60204			From lead-out connection to system	1 x per system

* Compliant to DIN VDE 0100 sections 410 and 430 (no permanent load) 3 phases + N+ PE (three phase current)

Scope of delivery by WÖHR (unless otherwise specified in the order)

Item	Description
6	Lockable main switch
7	Main switch cabinet for grid 1–4
8	Hydraulic power pack 3.0 kW with three-phase motor. Ready-wired switching cabinet with motor safety contactor
9	Operating device
10	Extra switch cabinet for grid 5–8

Notes and directions

Scope of application

- suitable for residential buildings, office buildings and business premises, hotels
- only for long-term users that have been instructed on how to use the system
- for frequently changing users (e.g. for office, hotel and business premises or similar):
  - performance of technical system adjustments is necessary
  - please consult with WÖHR

Function

- one empty space per unit on entrance level
- platforms on entrance level are moved sideways
- platforms on the upper level are lowered to the empty space on the entrance level

Numbering of the parking places

- empty space on the entrance level on the left

1 –	2 3	4 5	6 7	8 9

- the numbering for each unit starts with 1
- different numbering of parking places is possible at extra cost (software changes are necessary)

Hydraulic power pack

Arrangement of the hydraulic power pack:
– within the unit

Noise protection

Basis is the German DIN 4109 “Noise protection in buildings”.

With the following conditions required 30 dB (A) in rooms can be provided:

- noise protection package from our accessory
- insulation figure of the construction of min. $R'_W = 57$ dB
- walls which are bordering the parking systems must be done as single wall and deflection resistant with min. m’= 300 kg/m²
- solid ceiling above the parking systems with min. m’= 400 kg/m²

At differing constructional conditions additional sound absorbing measures are to be provided by the customer.

The best results are reached by separated sole plates from the construction.

Increased sound insulation (separate agreement):

It is based on VDI 4100 „Sound insulation in building construction“ Assessment and proposals for increased sound insulation.

Under the following conditions, 25 dB (A) can be complied with in living spaces and bedrooms:

- sound insulation package according to offer/order
- Sound insulation value of the building structure of min. $R'_W = 62$ dB (to be performed by the customer)

Note:
User noises are not subject to the requirements (see VDI 4100, Scope - Notes). User noises are basically noises that can be individually influenced by the user of the parking systems (e.g. driving on the platform, closing of vehicle doors, engine and brake noises).

Temperature

- system operating range: +5° bis +40°C (with unloaded platforms and low temperatures, a reduced lowering speed is to be expected)
- humidity: 50 % at +40° C
- if use in deviating temperature ranges is planned, constructive adjustments may be necessary (please consult with WÖHR)

Conformity examination (TÜV)

- voluntary conformity assessment by the TÜV SÜD

The parking systems are compliant to:
- EC Machinery Directive 2006/42/EC
- DIN EN 14010
- Specification VDMA 15423

Switch cabinet

Arrangement of the switch cabinet:
– within the unit

Lighting

- sufficient lighting of the driving aisle and of the parking places must be performed by the customer

Fire safety

- all fire safety requirements and all mandatory equipment (fire extinguisher and fire alarm systems, etc.) must be performed by the customer
- WÖHR will provide documents on attachment points and clearances for sprinklers on request

Railings

If walkways are arranged directly to the side or behind the systems, railings have to be provided by the customer acc. to local requirements, height min. 200 cm – this is applicable during the construction phase too.

Maintenance

- WÖHR and all the WÖHR partners abroad provide an installation and customer service network
- regular, annual maintenance is provided subject to the stipulation of a maintenance agreement
- local requirements for electrical doors regarding the technology, maintenance and revision are not subject of our delivery. These matters have to be observed and carried out by the customer, according to the local regulations.

Prevention of corrosion damage

- all operations listed in the WÖHR Cleaning and Maintenance Instructions are to be performed regularly (independently of maintenance operations)
- zinc-plated parts, components and platforms are to be kept clean of dirt, road-salt and any other debris (due to corrosion hazards)
- always keep the garage well ventilated and deaerated

Surface protection

- please consider the information on surface protection!

Tender specification

- please consider the specifications!

Parking Place-Profile

- please consider the product information Parking Place-Profile!

Electromobility

- please consider the product information power supply!
- depending on the position of the charging point on the electric vehicle, collision points with protruding plugs and charging cables can occur

Sliding doors and Operating concepts

- please consider the product information Sliding doors and Operating concepts!

Construction formalities

- the documentation necessary for construction permit applications is provided by WÖHR on demand

Construction alterations and/or modifications

- the right to construction or model modifications and/or variations is hereby reserved
- the right to any subsequent part modification and/or variation and amendments in procedures and standards due to technical and engineering progresses or due to environmental regulation changes is also hereby reserved