

PRODUCT DATA

DIMENSIONS, TECHNICAL INFORMATION AND PERFORMANCE
SPECIFICATION

kvario 8000








PARK
& SMILE

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Explanation of symbols

-  Maximum 5 parking levels
Platforms accessible horizontally.
-  max. load per parking space in kg.
Upweighting over 2000 kg possible with surcharge (see "Vehicle data", page 4).
-  Parking space load can be subsequently upweighted (see "Vehicle data", page 4).
-  Traversable and can be combined with other kVario systems as a KombiSystem.
-  The systems provided are consistent with DIN EN 14010, the VDMA 15423 specification and the EC Machinery Directive 2006/42/EC.

Dimensions and tolerances



All dimensions specified in drawings and tables are given in cm.
All dimensions and minimum final dimensions.
Tolerance for dimensions +3/-0 cm.
In order to adhere to the minimum final dimensions, the tolerances in accordance with the German Construction Tendering and Contract Regulations [VOB], Part C (DIN 18330 and 18331) and DIN 18202 must also be taken into account.

Function diagram with standard designation



As standard, parking spaces are labelled by row, grid and level.

- The first number stands for the row
- The middle two numbers stand for the grid
- The last number stands for the level: 1=UF 4 | 2=UF 3 | 3=UF 2 | 4=UF 1 | 5=GF | 6=LF 1 | 7=LF 2 | 8=LF 3 | 9=LF 4

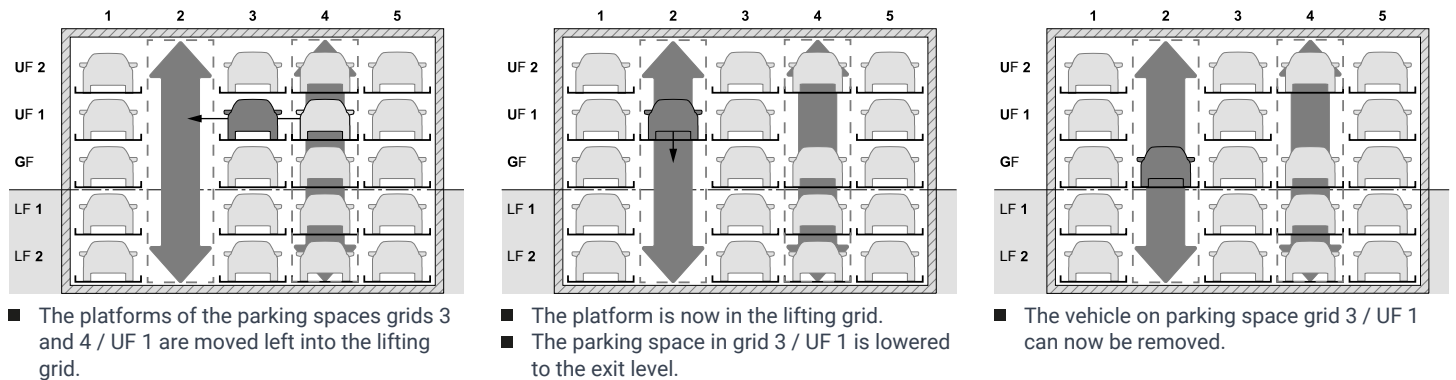
In the example, parking space 1033 is the parking space in row: 1, grid: 3, level: UF 2.

Arrangement of the rows and grids (see "Arrangement of grids – KombiSystem", page 9).

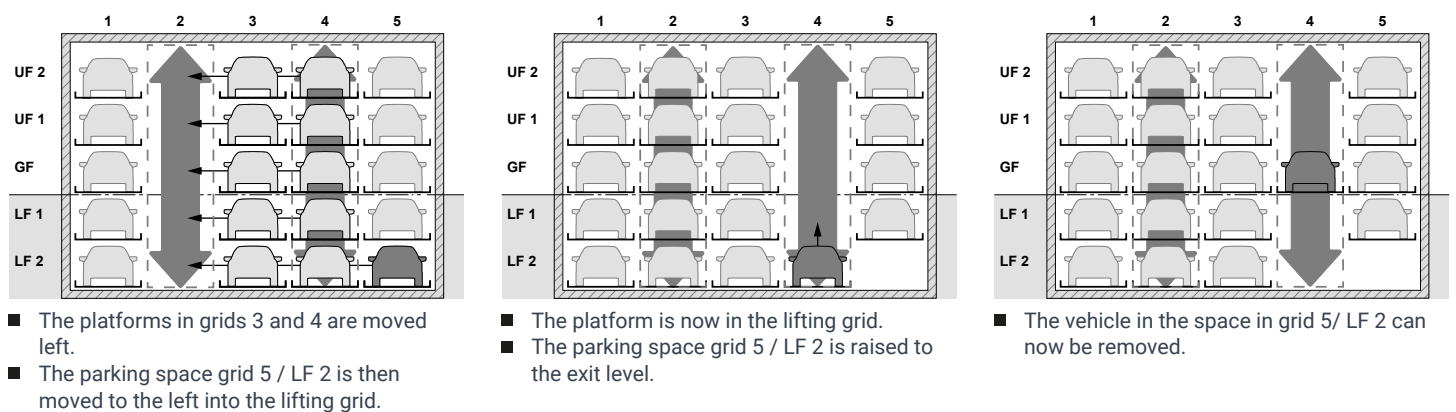
Examples:

- Selection of the parking space via the control panel; all doors must be closed.
- Representation of parking spaces in a row.

Vehicle in 1st upper floor (UF 1) of grid 3 - parking space 1034



Vehicle in the 2nd lower floor (LF 2) of grid 5 - parking space 1057



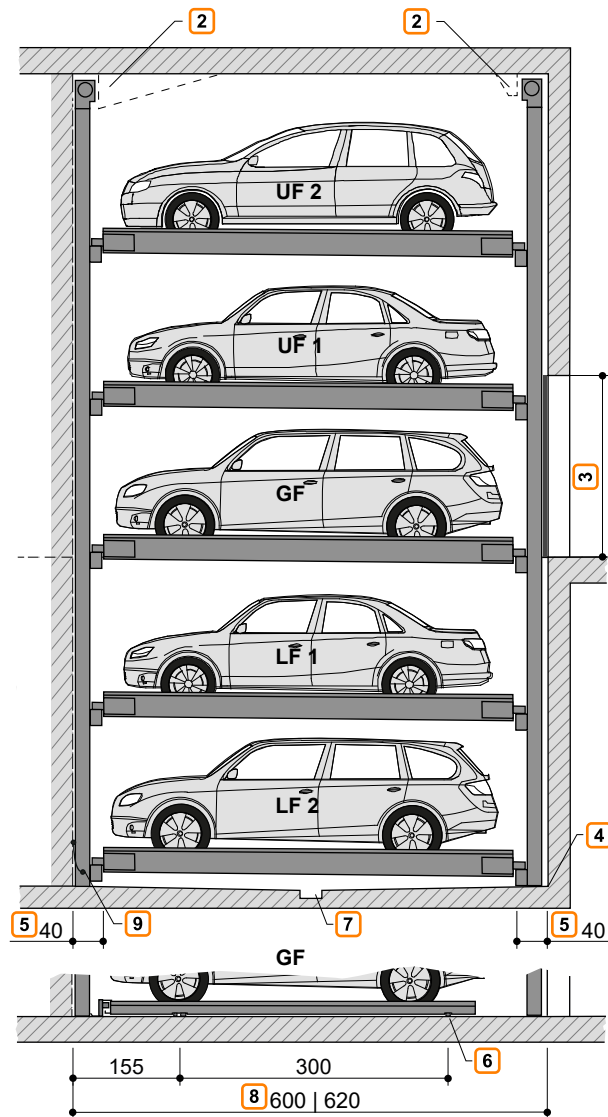
System overview

Levels	System kVario ¹										
	8140	8130	8120	8230	8220	8320	8310	8300	8410	8400	8500
	1▲ 4▼	1▲ 3▼	1▲ 2▼	2▲ 3▼	2▲ 2▼	3▲ 2▼	3▲ 1▼	3▲ 0▼	4▲ 1▼	4▲ 0▼	5▲ 0▼
UF 4											
UF 3											
UF 2											
UF 1											
GF											
LF 1											
LF 2											
LF 3											
LF 4											

¹ Detailed description (see "Type overview", page 7)

Overview of building configuration

Building configuration 3 ▲ | 2 ▼ 1



- 1 Maximum 5 parking levels Other versions (see "Type overview", page 7).
- 2 Clearance for customer installations – consultation with KLAUS Multiparking required.
- 3 Clear height in accordance with local regulations. Maximum vehicle height + 10 cm.
- 4 No fillets/haunches are permitted at the transition from the pit floor to the walls. If fillets/haunches are required, the systems must be narrower or the pits wider.
- 5 These areas must be horizontal and at the same level throughout the pit.
- 6 The tolerances for evenness of the roadway (floor) must be adhered to in accordance with DIN 18202, Table 3, row 3.(see "Detail of building configuration - rail system", page 11).
- 7 Slope with water collection channel (see "Drainage", page 16).
- 8 ■ 600 cm for vehicles up to 5.0 m long
■ 620 cm for vehicles up to 5.2 m long
Shorter versions are possible on request - observe local regulations on parking space lengths.
We recommend a minimum pit length of 620 cm for comfortable use of your parking space and increasingly longer vehicles.
- 9 Equipotential bonding from the foundation earth connection to the system (on site).



If fire-extinguishing systems are required, the customer must ensure that sufficient clearance is provided.

Vehicle data

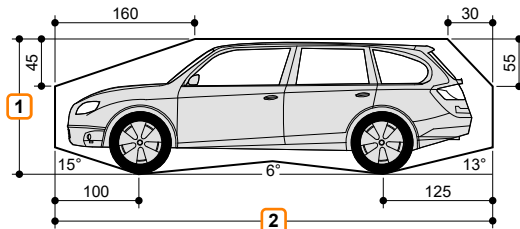
Parking options

Series vehicles:
saloon, estate, SUV, van in accordance with clearance gauge and maximum parking space load.

	UF GF LF 3	
Weight 4	2000 kg	3000 kg
Wheel load	500 kg	750 kg

- 1 Vehicle height (see "Overview of system types and ceiling heights", page 5)
- 2 Vehicle length (see "Overview of building configuration", page 4)
- 3 UF = upper floor| GF = ground floor| LF = lower floor
- 4 Individual space loads can also be subsequently upweighted to 3000 kg.

Clearance gauge



Vehicle width 190 cm with platform width 230 cm.
Correspondingly wider vehicles can be parked with wider platforms.

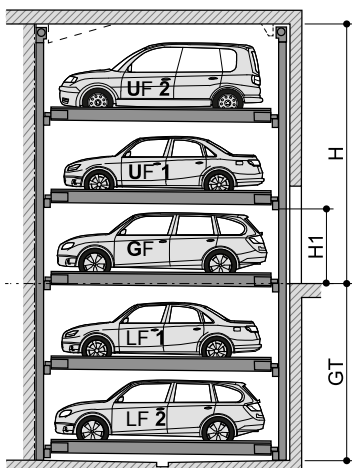
Overview of system types and ceiling heights



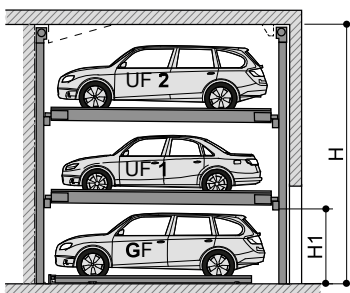
Each level in the parking system is designed for the same vehicle height. Different vehicle height combinations are possible in consultation with KLAUS Multiparking.

In the design, UF and LF levels can be freely combined. A minimum of 3 levels must be selected, but no more than 5 levels. The combination 2▲ | 1▼ is covered by out parking system TrendVario 6300.

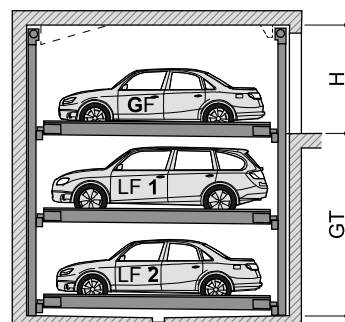
Building configuration with LF / UF



Building configuration without LF



Building configuration with LF



Vehicle height GF	H1
200	210
205	215
210	220

GT: Pit depth

H: Ceiling height

H1: Headroom

		Without pit GF min. 2.0 m Vehicle height								
	Levels	170 1	175 1	180 1	185 1	190 1	195 1	200	205	210
H	with 4 UF	1000	1020	1040	1060	1080	1100	1120	1145	1170
	with 3 UF	810	825	840	855	870	885	900	920	940
	with 2 UF	620	630	640	650	660	670	680	695	710
	with 1 UF	430	435	440	445	450	455	460	470	480
	GF									
H - Ceiling height										

1 With level design 1▲ | x▼ vehicle height GF: 200 cm

		Without upper floor GF min. 2.0 m Vehicle height								
	Levels	170 1	175 1	180 1	185 1	190 1	195 1	200	205	210
GT	GF	235	235	235	235	235	235	235	240	245
	with 1 LF	215	220	225	230	235	240	245	250	255
	with 2 LF	405	415	425	435	445	455	465	475	485
	with 3 LF	595	610	625	640	655	670	685	700	715
	with 4 LF	780	800	820	840	860	880	900	920	940
H - Ceiling height										

1 With level design 1▲ | x▼ vehicle height GF: 200 cm

		With pit With upper floor GF min. 2.0 m Vehicle height								
	Levels	170 1	175 1	180 1	185 1	190 1	195 1	200	205	210
H	with 3 UF	800	815	830	850	865	880	895	915	935
	with 2 UF	615	625	635	645	655	665	675	690	705
	with 1 UF	425	430	435	440	445	450	455	465	475
	GF									
GT	with 1 LF	215	220	225	230	235	240	245	250	255
	with 2 LF	405	415	425	435	445	455	465	475	485
	with 3 LF	595	610	625	640	655	670	685	700	715
H - Ceiling height										

1 With level design 1▲ | x▼ vehicle height GF: 200 cm

Example configuration



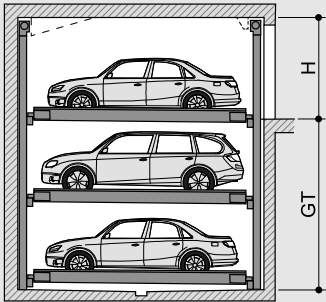
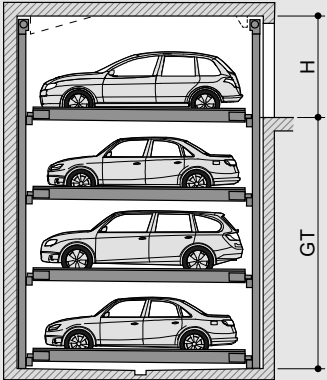
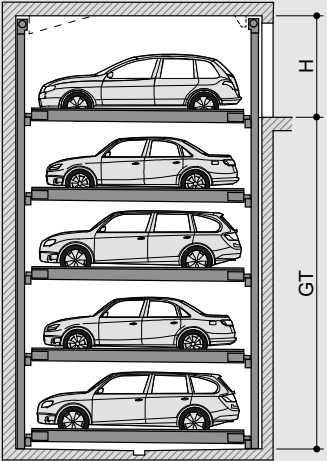
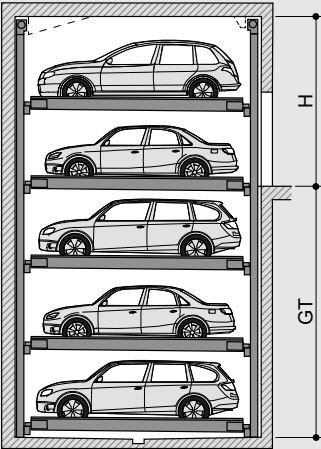
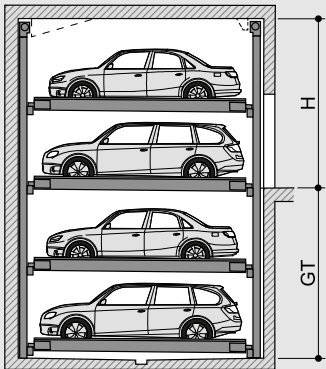
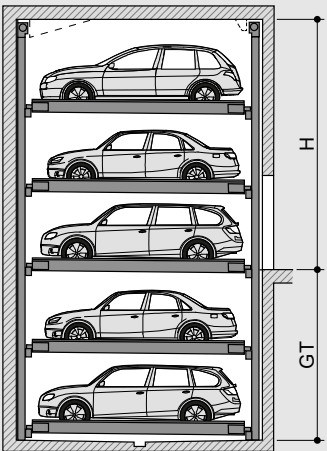
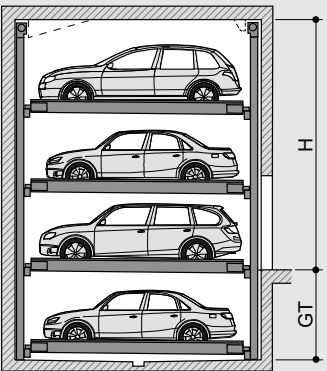
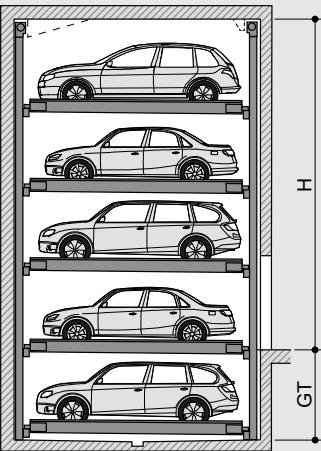
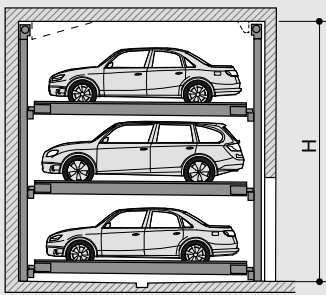
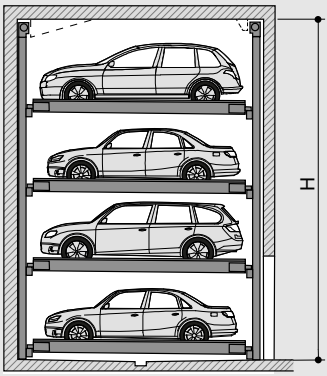
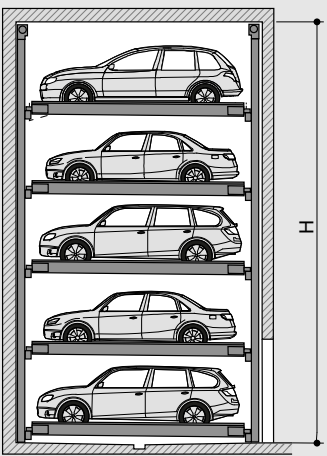
Example: Vehicle height UF | GF | LF 200 cm, Level design 2▲ | 2▼

Deck height: 455 cm

Pit depth: 465 cm

	Levels	Vehicle height UF GF LF								
		170 1	175 1	180 1	185 1	190 1	195 1	200	205	210
H	with 3 UF	800	815	830	850	865	880	895	915	935
	with 2 UF	615	625	635	645	655	665	675	690	705
	with 1 UF	425	430	435	440	445	450	455	465	475
	GF									
GT	with 1 LF	215	220	225	230	235	240	245	250	255
	with 2 LF	405	415	425	435	445	455	465	475	485
	with 3 LF	595	610	625	640	655	670	685	700	715
H - Ceiling height										

Type overview

	kVario 8120 1 ▲ 2 ▼	kVario 8130 1 ▲ 3 ▼	kVario 8140 1 ▲ 4 ▼	kVario 8230 2 ▲ 3 ▼
with pit				
	kVario 8220 2 ▲ 2 ▼	kVario 8320 3 ▲ 2 ▼	kVario 8310 3 ▲ 1 ▼	kVario 8410 3 ▲ 2 ▼
with pit				
	kVario 8300 3 ▲ 0 ▼	kVario 8400 4 ▲ 0 ▼	kVario 8500 5 ▲ 0 ▼	
without pit				

Width dimensions

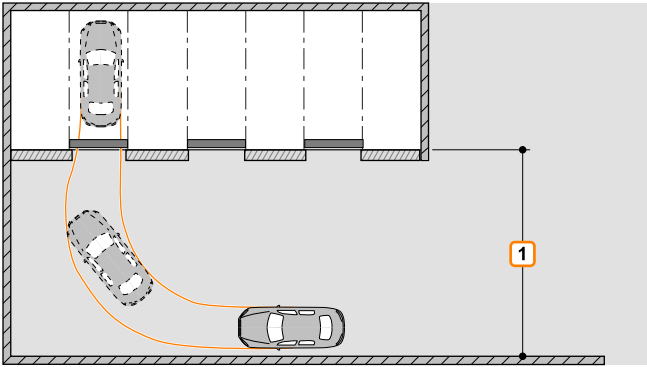


We recommend platform widths of minimum 250 cm and driving lane widths of 650 cm in order that vehicles can comfortably access the Multiparking system and enter and leave without difficulty.

Narrower platforms may impede parking according to the following criteria.

- Driving lane width
- Entrance conditions
- Vehicle dimensions

1 Observe minimum driving lane width in accordance with local regulations.



For commercial use of doors with electrical drive systems, an inspection log is required in accordance with ASR A1.7 'Technical rules for workplaces' in Germany. The door must be inspected by an expert before commissioning and annually thereafter and the result entered in the inspection log. The inspection must be carried out independently of maintenance. Observe local regulations on operation of electrical doors.

Width dimension with door

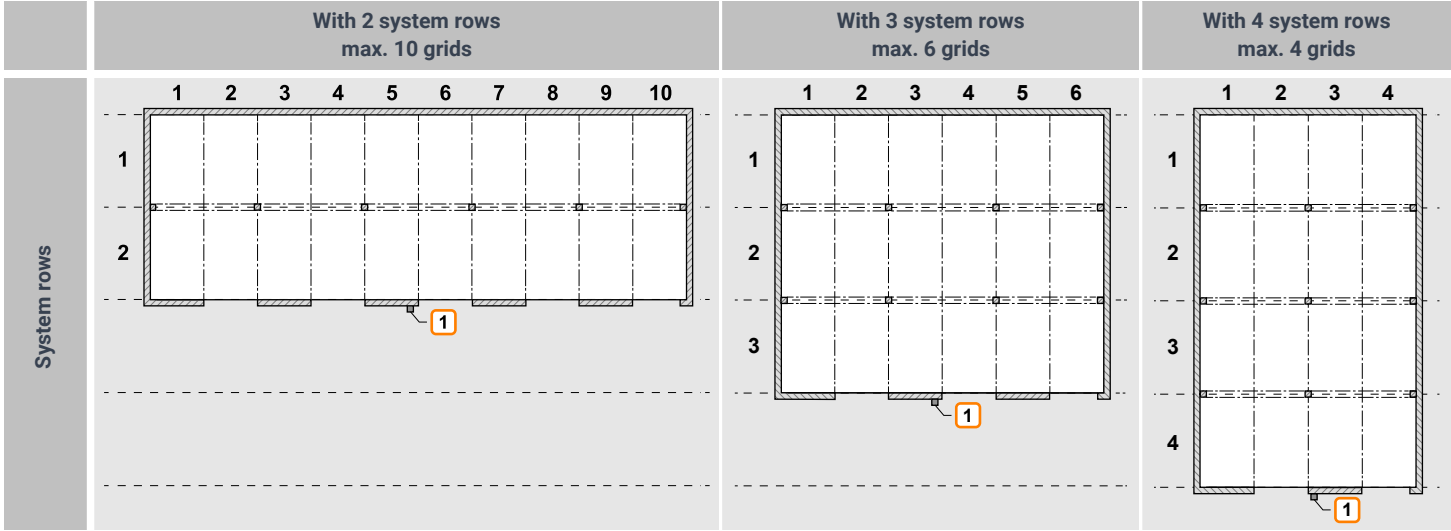
	1 door	2 doors	Door per 2 grids		
Walls outside the pit					
	Clear platform width	RB 1	B1	B2	B3
Width dimensions	230	250	280	230	270
	240	260	290	240	280
	250	270	300	250	290
	260	280	310	260	300
	270	290	320	270	310

- 1** RB = grid width. These dimensions **must** be adhered to.
- 2** If walls are replaced by supports or carriers, the openings must be closed by DIN EN ISO 13857 compliant customer-provided barriers to ensure the safety of the parking system. This may be requested from KLAUS Multiparking for a surcharge.

Arrangement of grids – KombiSystem



With single row kVario park systems up to 12 grids are possible (see "Maximum number of parking spaces", page 9). When planning multi-row park kVario systems, consultation with KLAUS Multiparking is required.



1 Control panel: For a single row park system with more than ten grids, use of two controls panels is required to improve clarity and ease of use.

Maximum number of parking spaces



KLAUS Multiparking recommends limiting the size of the system to no more than 50 parking spaces for the following reasons:

- Power - otherwise the connected electrical power will be very high
- Waiting times - increase in access time during peak user times

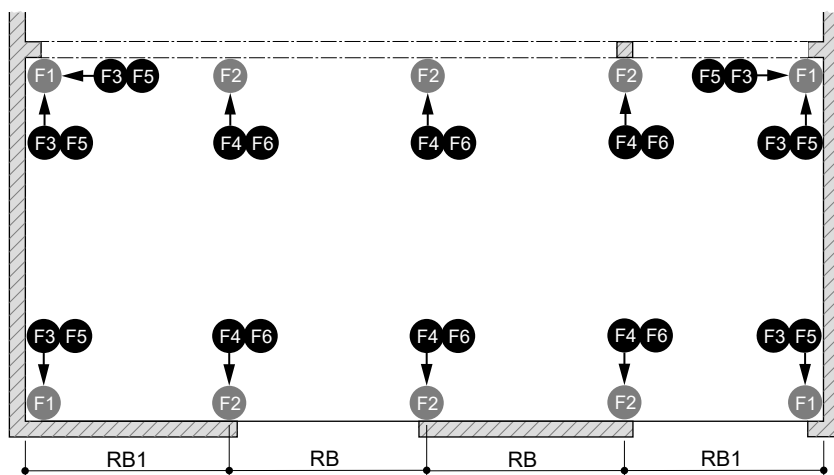
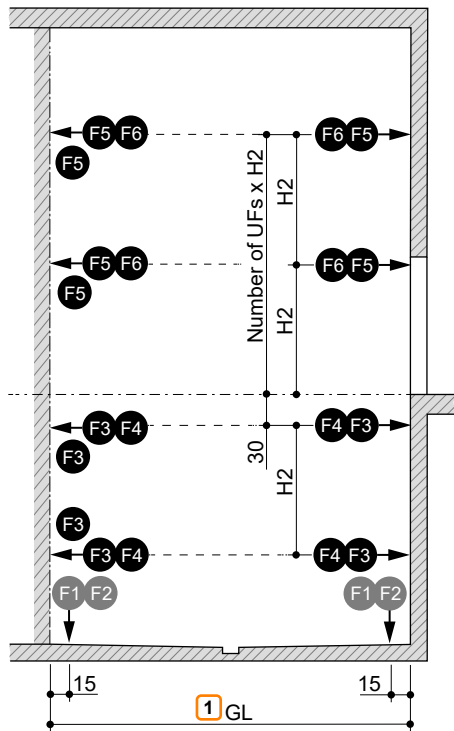
Levels	Grid										
	2	3	4	5	6	7	8	9	10	11	12
3	3	6	9	12	15	18	21	24	27	30	33
4	4	8	12	16	20	24	28	32	36	40	44
5	5	10	15	20	25	30	35	40	45	50	55
	Maximum number of parking spaces per row 1										

1 With multi-row systems (KombiSystem), the number of parking spaces of the individual systems must be added together.

Loading schedule



The systems are dowelled into the ground. The drill hole depth in the floor plate is approx. 15 cm, in the walls approx. 12 cm.
 The floor plate and walls must be from concrete (quality min. C20/25).
 The dimensions for the bearing points have been rounded. If the precise figures are required, please consult KLAUS Multiparking.



Parking space load		F1	F2	F3 ³	F4 ³	F5	F6
3 Parking levels	2000 kg	+ 27.0 kN	+ 54.0 kN	± 2.9 kN	± 5.8 kN	± 0.5 kN	± 1.0 kN
	3000 kg	+ 34.5 kN	+ 69.0 kN	± 3.1 kN	± 6.2 kN	± 1.0 kN	± 2.0 kN
4 Parking levels	2000 kg	+ 36.0 kN	+ 72.0 kN	± 2.9 kN	± 5.8 kN	± 0.5 kN	± 1.0 kN
	3000 kg	+ 45.5 kN	+ 91.0 kN	± 3.1 kN	± 6.2 kN	± 1.0 kN	± 2.0 kN
5 Parking levels	2000 kg	+ 44.0 kN	+ 88.0 kN	± 2.9 kN	± 5.8 kN	± 0.5 kN	± 1.0 kN
	3000 kg	+ 56.5 kN	+ 113.0 kN	± 3.1 kN	± 6.2 kN	± 1.0 kN	± 2.0 kN

Max. vehicle height	H2
175	205
180	210
185	215
190	220
195	225
200	230
205	235
210	240

+ = Compressive forces
 - = Tensile forces

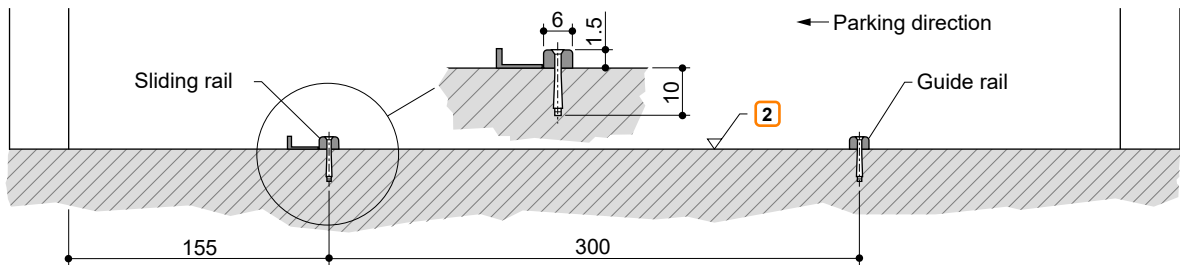
- ¹ GL = building length (see "Overview of building configuration", page 4).
² RB = grid width. These dimensions **must** be adhered to. (see "Width dimension with door", page 8).
³ Not necessary for 0 LF (see "Overview of system types and ceiling heights", page 5).

Detail of building configuration - rail system



- Rail load due to a moving traffic load:
- With parking space load 2000 kg: 6.5 kN per wheel
 - With parking space load 3000 kg: 9.0 kN per wheel

Laying on finished floor ¹



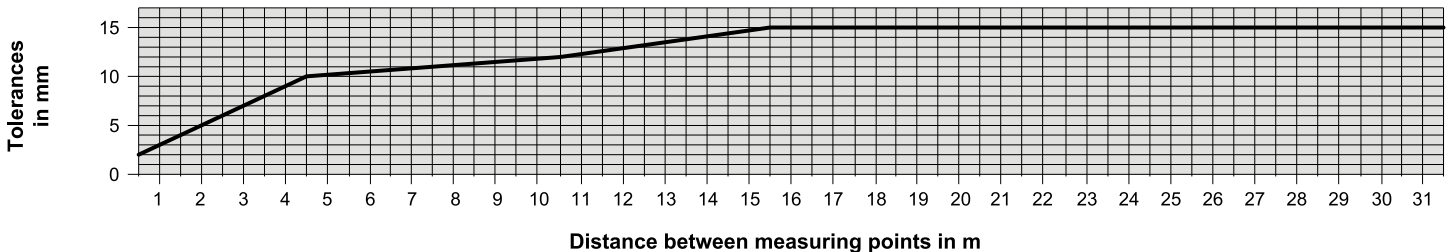
- ¹ The tolerances for evenness of the roadway (floor) must be adhered to in accordance with DIN 18202, Table 3, row 3. There must be no building joints or expansion joints in the area around the rail system.
- ² Upper edge finished floor

Evenness tolerance – extract from DIN 18202, Table 3



The safety clearance between the outer lower edges of the ParkBoard and the floor must not exceed 2 cm. To comply with the requirement in DIN EN 14010 and to reach the requisite floor evenness, the evenness of the finished floor in accordance with DIN 18202, Table 3, row 3 must not be exceeded. The customer does not, therefore, need to level the floor.

Row	Reference	Inside micrometer as limit values in mm with measuring point distances in m to ¹				
		0.1	1	4	10	15
3	Finished floors, e.g. screeds as floor screeds, screeds for floor coverings, floor coverings, tile coverings, levelled and glued coverings	2	4	10	12	15

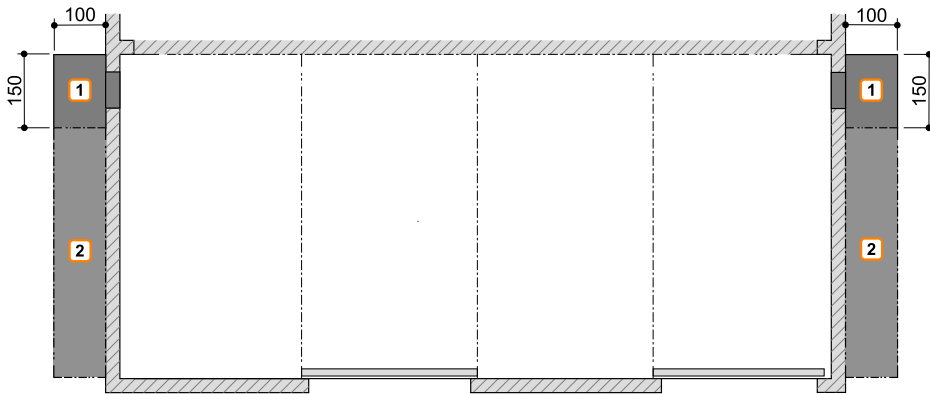


- ¹ Intermediate values can be found in the diagram and should be rounded up.

Detail of building configuration - maintenance access



For maintenance of the parking system, the customer must provide maintenance access to the sides via stairs or ladders to all levels. The maintenance accesses to the parking system must be secured by the customer – consultation with KLAUS Multiparking required.

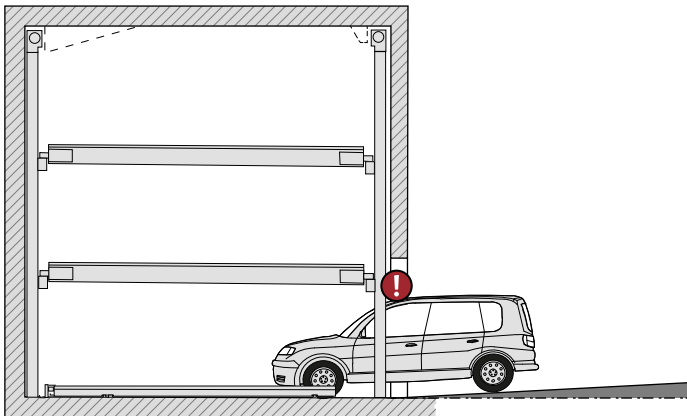


- 1 On site maintenance access
- 2 Maintenance access alternative position

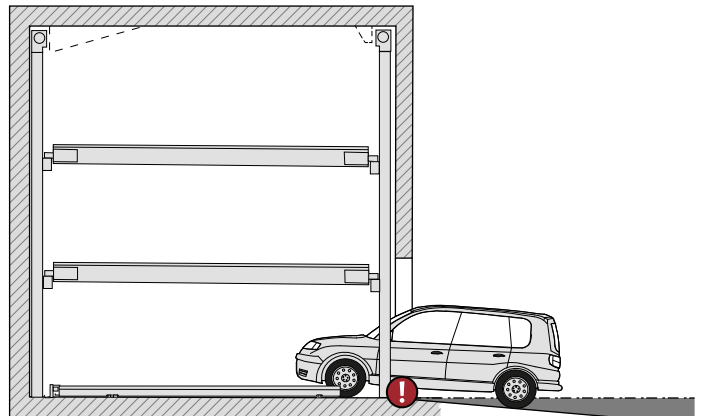
Access incline



The maximum access inclines specified in the symbol sketch must not be exceeded. Improper configuration can lead to extreme difficulty accessing the system, for which KLAUS Multiparking cannot be held liable. Where above-ground garages are on a slope, provision of a drainage gutter in the access is recommended.



max. 3% slope



max. 5% gradient

Electrical installation

Switch cabinet and master switch

It must be possible to access the switch cabinet without danger. The lockable master switch must be positioned so that the entire entry area of the parking system can be surveyed.

Control panel with emergency-stop

- Attachment at a clear point (e.g. pillar).
 - Secured against external operation
- If required, an empty pipe EN 50 (M50) with a pulling wire must be provided on site for the supply line to the control panel.

Supply cable to master switch

Supply cable min. 5 x 10 mm² (3 PH+N+PE) to switch cabinet with pre-fuse 3 x 40 A (slow blow) or circuit breaker 3 x 40 A (trip characteristic K or D) to be provided by the customer

National and local laws and regulations regarding electrical energy supply must be observed (see *"Supply cable to master switch - foundation earth", page 16*).

Planning information

KLAUS Multiparking must be consulted for the specification of the following components.

- Switch cabinet – position and size
- Master switch – position
- Control panel – position and number
- Mobile Internet Box - position and cable route to the main control cabinet

Internet connection - Mobile Internet Box

The internet connection is part of the parking system and is provided by KLAUS Multiparking GmbH.

The **Mobile Internet Box** from KLAUS Multiparking GmbH is installed for this purpose.

Further Information is available in the technical specification **TS Mobile Internet Box**.

Technical information

Usage area

The system is suitable for a fixed group of users as standard. Where users change (e.g. short-term parking in office buildings or hotels), structural modifications to the Multiparking system are required. Please request a consultation if required.

Parking space designation

Please consult the function diagram for the standard designation of the parking spaces (see *"Function diagram with standard designation", page 3*). Alternative designations are possible with a surcharge.

Please note the following specifications:

- As standard, the empty grid (first lifting grid) is situated on the left.
- Any alternative designations must be notified 8 to 10 weeks before delivery.

Ambient conditions

Ambient conditions for the areas around Multiparking systems: Temperature range -10 to +40° C. Relative humidity 50 % for a maximum outside temperature of +40° C. If ascent/descent times are specified, these relate to an ambient temperature of +10° C.

Seismic conditions

Local seismic conditions may require special precautions such as strutting. Please contact KLAUS Multiparking for seismic reports and advice.

Building application documents

Multiparking systems generally require approval. Please observe local regulations and stipulations.

Care

To prevent corrosion damage, please observe our special cleaning and care instructions and ensure that your garage is well ventilated.

Corrosion protection

Our coating system was designed in accordance with DIN EN ISO 12944-5 Appendix A, Paint systems for corrosivity category C3. The powder coating was checked in accordance with DIN EN ISO 12944-6 and compliance with the requirements verified in test series. Zinc coatings are in accordance with DIN EN ISO 1461 and DIN EN 10346.

Electrically driven doors

For commercial use of doors with electrical drive systems, an annual inspection is required in accordance with ASR A1.7 'Technical rules for workplaces' in Germany. We urgently recommend concluding a maintenance contact as these services are included for the complete system.

CE conformity

The systems provided are consistent with DIN EN 14010, the VDMA 15423 specification and the EC Machinery Directive 2006/42/EC.

Noise protection

In accordance with DIN 4109-1 Noise protection in high-rise - Section 9: Maximum sound pressure level in living and sleeping areas 30 dB (A). User noise is not subject to the requirements.

The following dimensions are required for adherence to this value:

- Noise protection package in accordance with quote/order (KLAUS Multiparking)
- Sound insulation dimension of the building structure of min. R'_w = 57 dB (service to be provided by the customer)

Note:

User noise is noise that can be influenced individually by the user of our Multiparking systems. This includes, e.g., accessing the platform, the slamming of vehicle doors, engine and brake noise.

Performance specification

Description

Multiparking system for independent parking of vehicles above and next to each another.

The system can be driven through and can be combined with other kVario parking systems.

Dimensions in accordance with the underlying pit, width and height dimensions.

Access to the parking spaces horizontally (installation tolerance $\pm 1\%$).

An access road must be provided over the entire width of the parking system (minimum driving lane width in accordance with local regulations).

The parking spaces are arranged on up to 5 levels one above the other. Vehicles park on stable steel platforms.

Each second grid is configured as a lifting grid. This also includes the access.

The grids in between are stowing grids, these stowing grids can only move the parking spaces sideways. There are no parking spaces in the first lifting grid.

The parking space is inserted from the side into this empty grid from a stowing grid so that the parking space can either be lowered, if it is an upper level parking space, or raised, if it is a lower floor parking space, to the entrance level. Consequently, two grids on three levels with three parking spaces is the smallest unit for this parking system.

Vehicle positioning in any parking space by positioning aid mounted on one side (to be adjusted in accordance with the operating instructions).

For safety reasons, the movement operation of the platforms always takes place behind locked doors.

All requisite safety equipment is integrated into the system. This essentially comprises a chain monitoring system, locking rails for the upper and lower platforms and locked doors. The doors can only be opened when the selected parking space has reached its parking position and all fall openings are secure.

Steel frame comprising:

- Supports (arranged in rows)
- Crossbeams and lengthways beams
- Sliding rails for the sideways moving platforms

Platform comprising:

- Platform profiles
- Adjustable positioning aid
- Chamfered ramp
- Side beams
- Crossbeams
- Screws, nuts, washers, spacers, etc.

Lifting equipment for platforms comprising:

- Gear motor
- Chain wheels
- Chains
- Limit switches

Drive unit of the sideways moving platforms:

- Gear motor with chain wheel
- Chains
- Sliding and guide rollers (low-noise)

Control:

- Central control point (control panel with emergency-stop) for selecting the desired parking space
- The electrical wiring from the system cabinet is provided by the supplier

Sliding doors - standard:

Size

Dimensions adjusted to the underlying widths and height dimensions.

The door consists of one door leaf.

Frame

- Frame structure with two vertical centre rungs and one horizontal centre rung from extruded aluminium profiles (anodised, coating thickness approx. 20 μm).

Door filling

Aluminium perforated plate

- Thickness 1.5 mm, RV 8-14 E6/EV1, anodised, coating thickness approximately 20 μm
- Ventilation cross-section of the filling approx. 30%

Plain aluminium sheet

- Thickness 2 mm, E6/EV1, anodised, coating thickness approximately 20 μm

Wire mesh

- Thickness 3 mm, machine width 12 mm x 12 mm, V2A

Sliding rails

- The ceiling sliding rail of the doors is attached to the ceiling and the floor sliding rail to the steel frame of the system.

Door actuation

- Electrical drive system by means of electric motor, above the door frame. For safety reasons, the movement operation of the platforms always takes place behind locked doors. An electrical signal generator is used to query the positions 'door open' and 'door closed'.

Please note:

Door apertures (at the side, covers over the sliding rails, etc.) and door suspensions are not included with the standard configuration but can be supplied as special equipment with a surcharge.

Services to be provided by the customer

Barriers

Barriers that may be required in accordance with DIN EN ISO 13857 to secure the pits where there are roadways immediately in front of, adjacent to or behind the systems. This also applies during the construction stage.

Parking space numbering

Parking space numbering, if required.

Building services systems

Any lighting, ventilation, fire-extinguishing and fire-alarm systems that may be required, plus clarification and compliance with corresponding official documentation.

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. A floating contact can be provided for actuation of parking space lighting provided by the customer.

Drainage

Functional drainage of the pit must be provided by means of, for example, a water collection channel towards the centre that is connected to the sewer system or a pump sump. The channel may contain a lateral slope, but not in the other pit areas (lengthways slope is already provided by the building dimensions). In the interests of environmental protection, we recommend coating the pit floor. Oil and/or fuel separators should be installed in accordance with local regulations.

Floor structure – rails

Floor structure in accordance with the details on the product data sheet (see "Detail of building configuration - rail system", page 11).

Recesses, tolerances for evenness of the roadway must be adhered to in accordance with DIN 18202, Table 3, row 3.
Lining for the rail system by means of cement screed over the entire length.
Laying the screed

Strip foundations

Due to structural conditions, the customer must erect an accessible platform when constructing strip foundations, level with the upper edge of the strip foundation.

Wall openings

Wall openings, if required.

Supply cable to master switch - foundation earth

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 electronics engineer. If this is not possible during assembly for reasons attributable to the customer, the customer must commission an electronics 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.

Door apertures

Door apertures, if required. This may be requested from KLAUS Multiparking for a surcharge.

Maintenance access

Two separate maintenance accesses via stairs or ladders with secured opening through to the parking system on each level is required on site (see "Detail of building configuration - maintenance access", page 12). For row systems, it may be sufficient if one row is equipped with maintenance accesses, although this depends on the project.

Subject to technical changes

In the course of technical progress, KLAUS Multiparking shall be entitled to use newer or different technologies, systems, processes or standards to provide the services than initially offered, provided that this does not disadvantage the customer in any way.

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