



Starke 3127&3121

Lift & Slide with Underground Car Stacker

> Introduction

The system is semi-automatic puzzle parking type, one of the most space-saving system that parks three cars on top of each other. All parking spaces can be selected and used independently. One level is in pit and another two on above, the middle level is for access. The user slides his IC card or inputs the space number on operation panel to shift spaces vertically or horizontally and then move his space to entry level automatically. Safety gate is optional to protect cars from theft or sabotage.



- Hydraulic driven
- Capacity of each platform is 2100kg or 2700kg
- Platform width up to 2400mm
- Recommended car spaces in each system < 32 vehicles.
- Programed automatic PLC control
- Operation by ID card or buttons
- Galvanized platform plates
- Foundation pit is required
- Combinable with individual BDP-2 system
- High level quality guarantee (German TUV / CE certified)

TUV compliant, which is the most authoritative certification in the world

Certification standard EN14010+A1:2009

Less land space occupied

Hydraulic drive system makes full use of the limited space, especially upper ceiling height and lower pit.

High elevating speed

8-12 meters/minute elevating speed makes platforms move to desired position within half minute, and dramatically reduces users' waiting time.

Low electricity consumption

It's driven by gravity and hydraulic pump is not working when platform descends, so the electricity consumption can be reduced.

Independent structure

The whole structure can be installed independently, there is no need to be reinforced with surrounding walls.

Modularized structure

Modularized structure makes structural parts and transmission parts standard and flexible for various layouts, it could simplify the fabrication and installation.

SUV parking available

The reinforced structure of Starke 3127 allows 2700kg capacity for all platforms with higher available height to accommodate SUVs.

Larger platform usable width

Wider platform allows users to drive cars onto platforms more easily.

Galvanized pallet

Far more beautiful and durable than observed, lifetime more than doubled. Anti-slip corrugated deck protect both vehicle and driver from possible slip and damage.

Leak-proof platforms

Specially bent side rails and galvanized waving plates prevent oil or water from dripping

Platform guiding protection

The innovative guiding system is adopted to make the movement of elevating platforms stable all the way

Zero accident security system

All-new upgraded security system, really reaches zero accident

Anti-falling locking device

Mechanical anti-falling locks hold the elevating platforms in place as protection from falling

Wire ropes and chains protection devices

Wire ropes and chains loosen detection devices ensures the safety in case the transmission system is loosen or broken

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Easy operation

Centralized control panel in front of the system allows users to operate conveniently by code and card.

Adjustable car stopper

The position of car stopper can be adjusted to fit for different wheel bases.

Further strengthened main structure of the equipment

The thickness of the steel plates and the weld joints have been specially increased

Low operation noise

Noise reduction is available on the centralized power unit, and no harm for body health and environment.

Gentle metallic touch, excellent surface finishing

After applying AkzoNobel powder, color saturation, weather resistance and its adhesion are significantly enhanced

Rich color

Great care is taken with the treatment of lacquer face, in order to improve the quality of products on surface looking to the maximum extent

Strong adhesion

The weather resistance of the spray powder has better performance under special technology, which can stand wear and tear

Excellent hydraulic pipeline system

Instead of welded steel tube, the new seamless cold drawn oil tubes are adopted to avoid any block inside of tube due to welding. The oil tubes, joints and fixtures are all updated to make our hydraulic system more sufficient and stable.

Superior chains provided by Korean chain manufacturer

The life span is 20% longer than that of the domestic chains

Galvanized screw bolts based on the European standard

Longer lifetime, much higher corrosion resistance

Hydraulic centralized control

Perfect shared power pack unit solution

Laser cutting + robotic welding

Accurate laser cutting improves the accuracy of the parts, and automated robotic welding makes the weld joints more firm and beautiful

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Specifications

> General

Model	Starke 3127	Starke 3121
Number of levels	3 (-1+2)	3 (-1+2)
Available car weight	2700kg	2100kg
Available car length	5000mm	5000mm
Available car width	1950mm	1950mm
Available car height	1700mm	1550mm
Drive mode	Hydraulic cylinder + wire ropes/chains	Hydraulic cylinder + wire ropes/chains
Control	Omron PLC centralized control system	Omron PLC centralized control system
Operation	Code & ID card	Code & ID card
Elevating speed	8-12m/min	8-12m/min
Sliding speed	7.5m/min	7.5m/min
Power supply	200-450V, 3P, 50/60Hz	200-450V, 3P, 50/60Hz
Finishing	Power coating with Akzo Nobel powder	Power coating with Akzo Nobel powder

> Mechanical & Hydraulic

Model	Starke 3127	Starke 3121
Hydraulic pump	Centralized commercial power unit	Centralized commercial power unit
Pump motor power	5.0Kw	4.0Kw
Pump flow	20L/min	20L/min
Pump working pressure	16MPa	16MPa
Sliding motor power	0.2Kw, 1:60	0.2Kw, 1:60
Cylinder seal	Italian Aston seals	Italian Aston seals
Hydraulic oil	L-HV 46#	L-HV 46#
Oil hose	Galvanized seamless tube	Galvanized seamless tube
Waving plate	Galvanized steel sheet $\delta=2$	Galvanized steel sheet $\delta=2$
Pulley	MC Oily reinforced nylon	MC Oily reinforced nylon
Chain	16A	16A
Wire rope	$\Phi 11$	$\Phi 10$

Safety devices

Design safety factor: the safety factor of transmission system is not less than 7, to make sure all structure and connections are strong and safe enough.

Emergency stop button: the emergency stop button can be activated to stop the system and cut off power supply at once in an emergency.

Chains loosen detection and break protection: any loosen or broken chain will be detected, and the whole system will be stopped and locked at once to protect users, vehicles and products from any accident.

Wire ropes loosen detection and break protection: any loosen or broken wire rope will be detected, and the whole system will be stopped and locked at once to protect users, vehicles and products from any accident.

Operation protection: after emergency stop button is activated, the equipment cannot work until emergency ends.

Over length detection: if a car longer than rated length is parked on the platform, the sensor will stop the system and give the alarm.

Over height detection: if a car higher than rated height is entering, the sensor will stop the system and give the alarm.

Accidental entrance detection: when a person or car is trying to enter into the system in operation, the sensor will stop the system at once and give the alarm.

Adjustable car stopper: the position of car stopper on the platform can be adjusted forwards or backwards according to different car lengths.

Platform buffering, anti-slip, anti-sway and positioning devices: each platform is well protected during movement by multiple nylon-cushions and positioning plates for buffering, anti-slip, anti-sway and positioning.

Anti-falling locks: mechanical anti-falling locks hold the elevating platforms in place as protection from falling.

Alarm lamp: An alarm lamp is blinking to remind the system in operation.

Buzzer: The buzzer will be activated to give the alarm if there is an error of over length, over height, over loading or accidental entrance, etc., as well as error indicator displayed on operation panel.

Motor over loading protection: if the motor is over loading due to some reason, the protection will cut off the power supply at once to protect the motor and cars on the platforms.

Phase failure & anti-phase protection: the control loop will stop the motor working at once if there is phase failure or anti-phase happens.

Over voltage protection: the control loop will cut off power supply at PLC front-end to protect PLC, if over voltage happens.

Positioning & end point limit switches: Positioning limit switches are placed to stop platform moving when the platform reaches desired position; the end point limit switch is an extra protection in case any positioning limit switch fails and the platform keeps moving.

Self-locking protection: if there is an electrical failure or emergency situation, sliding motor can apply the brake, hydraulic pump and valves be locked, and all moving devices stop.

Elevating and sliding interlock protection: the interlock protection always works to prevent elevating movement and sliding movement from simultaneity.

Slide positioning protection: stop blocks are placed on the end of sliding rails to stop platform sliding at desired position.

Under time & overtime protection: in the movement of elevating or sliding, an operation time under or over the given safety time range will be detected by the control system, and the equipment will be stopped and not work until trouble removal by the administrator or authorized person.

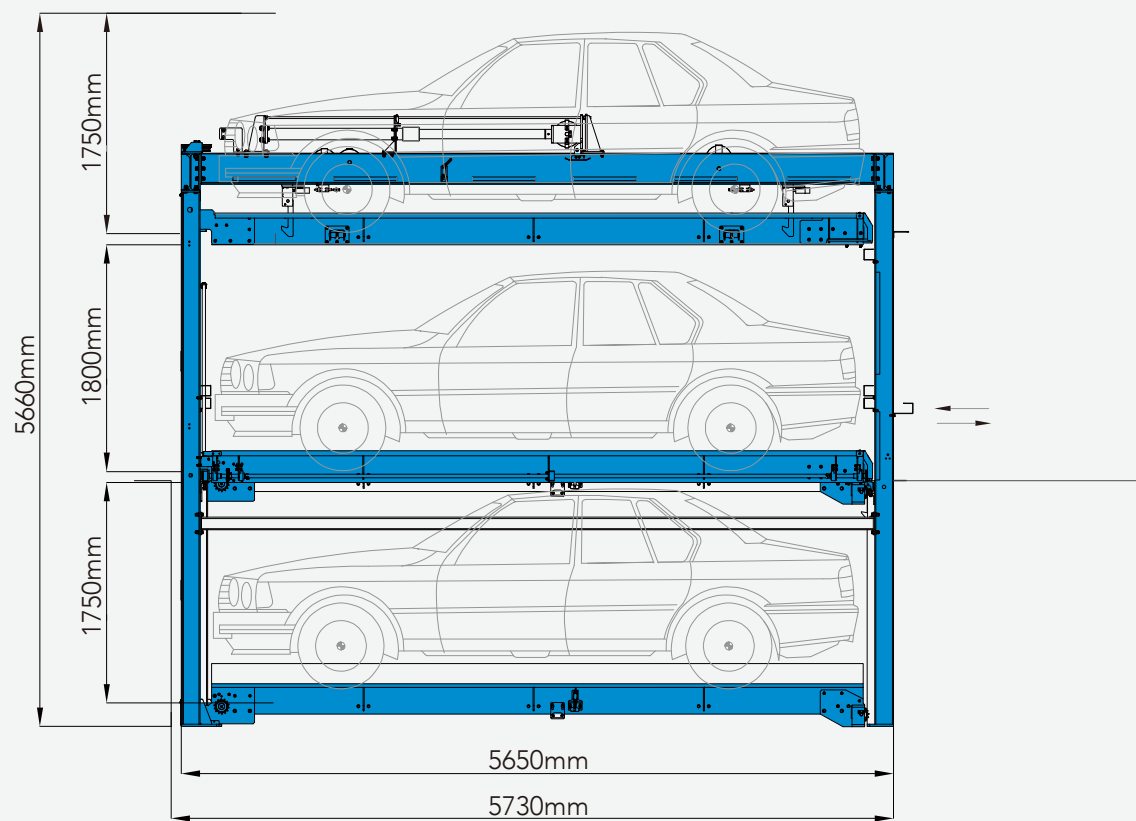
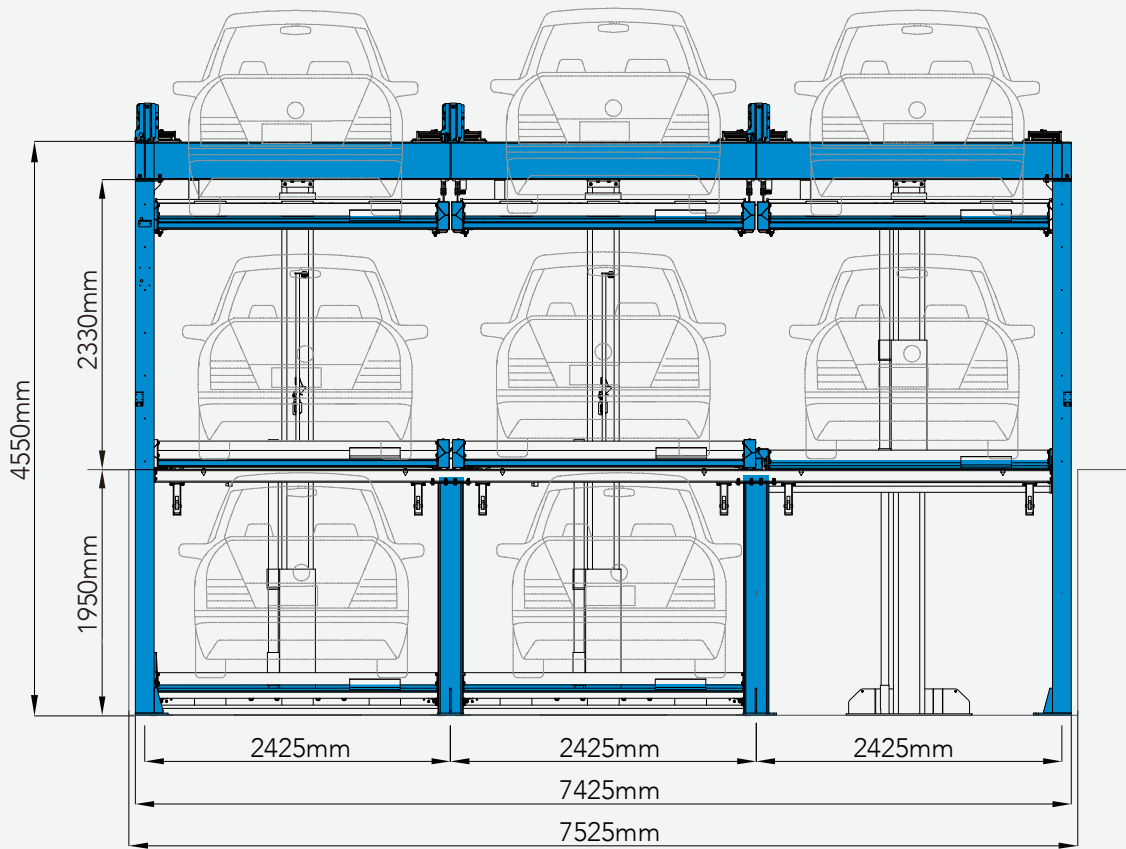
Platform overtravel protection: each platform is elevated by a hydraulic cylinder, which travels in a certain stroke and will prevent platform from unnecessary moving in case limit switches fail.

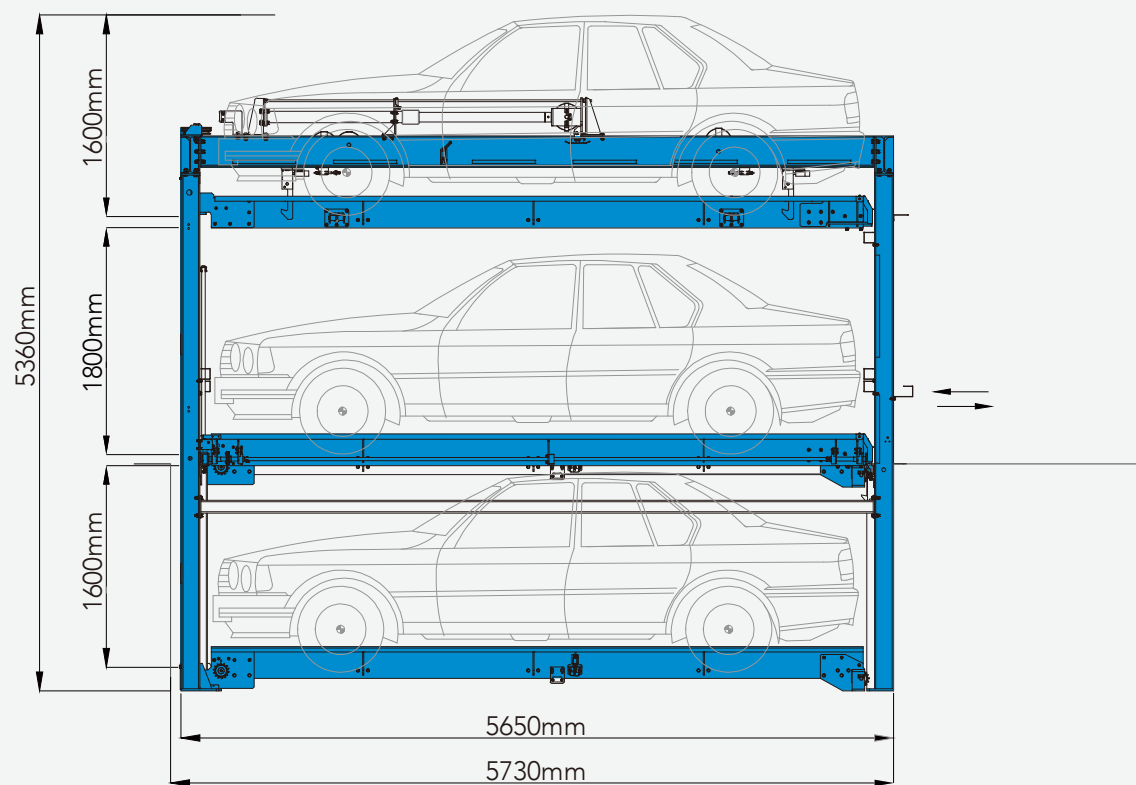
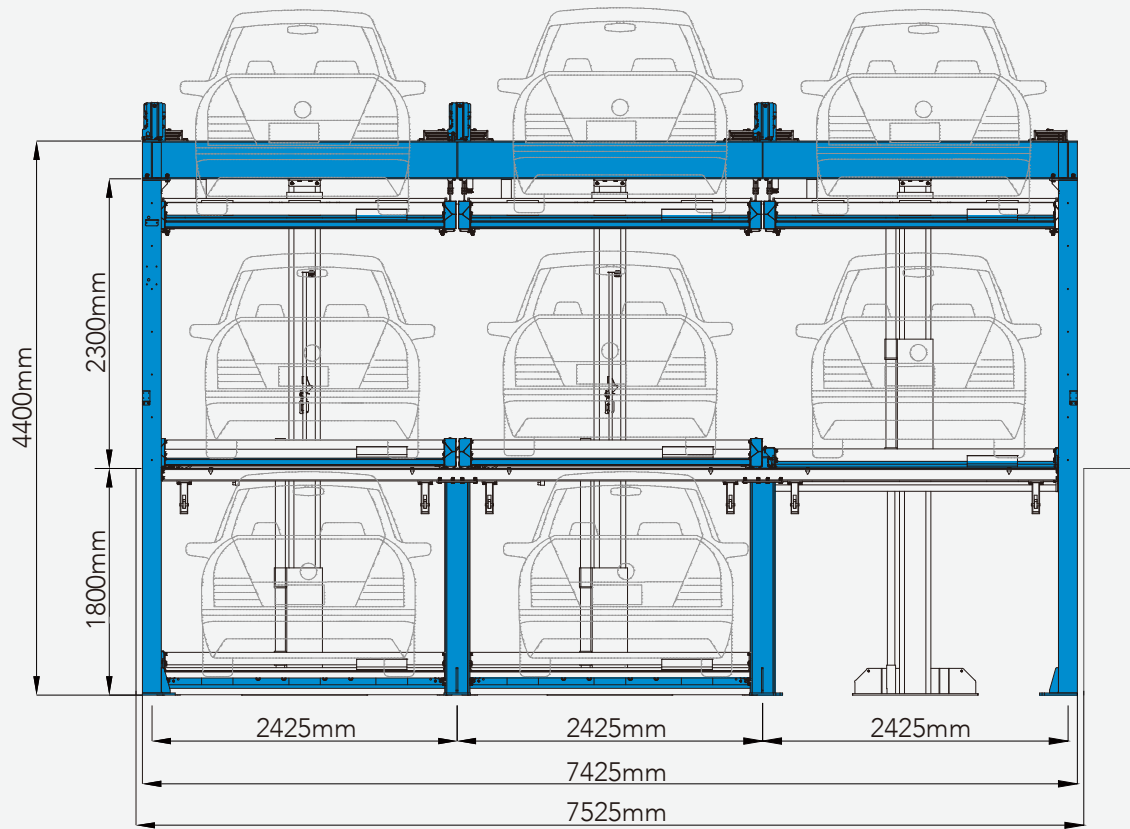
Password safety protection: password is requested to make sure only authorized person can operate the equipment.

Pressure sensor (optional): hydraulic fluid with abnormal pressure (higher or lower than rated pressure range) in oil piping system will be detected, and the system will be stopped and locked at once

Safety gate (optional): Two types of safety gates are optional to secure the parking system, cars and valued items inside, as well as avoiding any accidental entrance.

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Width dimensions

> Platform widths:

2225 mm:

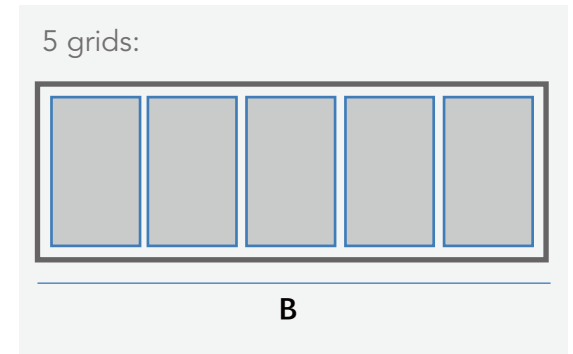
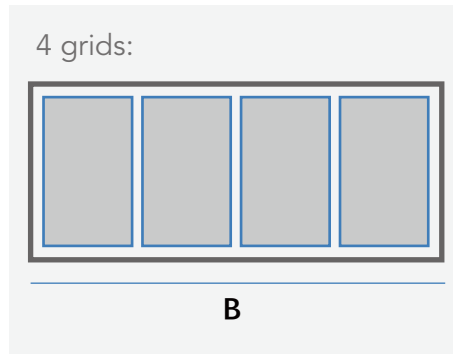
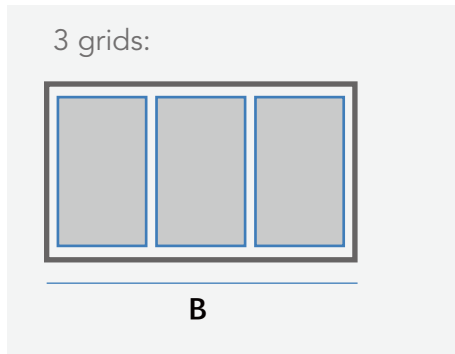
-For 1950 mm vehicle width (without outside mirror)

2300 – 2400 mm:

-For vehicles wider than 2000 mm (without outside mirror)

-For units at the end of the driving aisle

For comfortable parking, entry and exit conditions platform widths upon 2200 mm are recommended. Reduced platform width means reduced parking comfort depending on the vehicle width, vehicle type, individual driving style, access situation of the garage.



* The driving aisle width must comply with local regulations

Space requirements	Clear platform width
B	
7525	2225
7750	2300
8050	2400

Space requirements	Clear platform width
B	
10000	2225
10300	2300
10700	2400

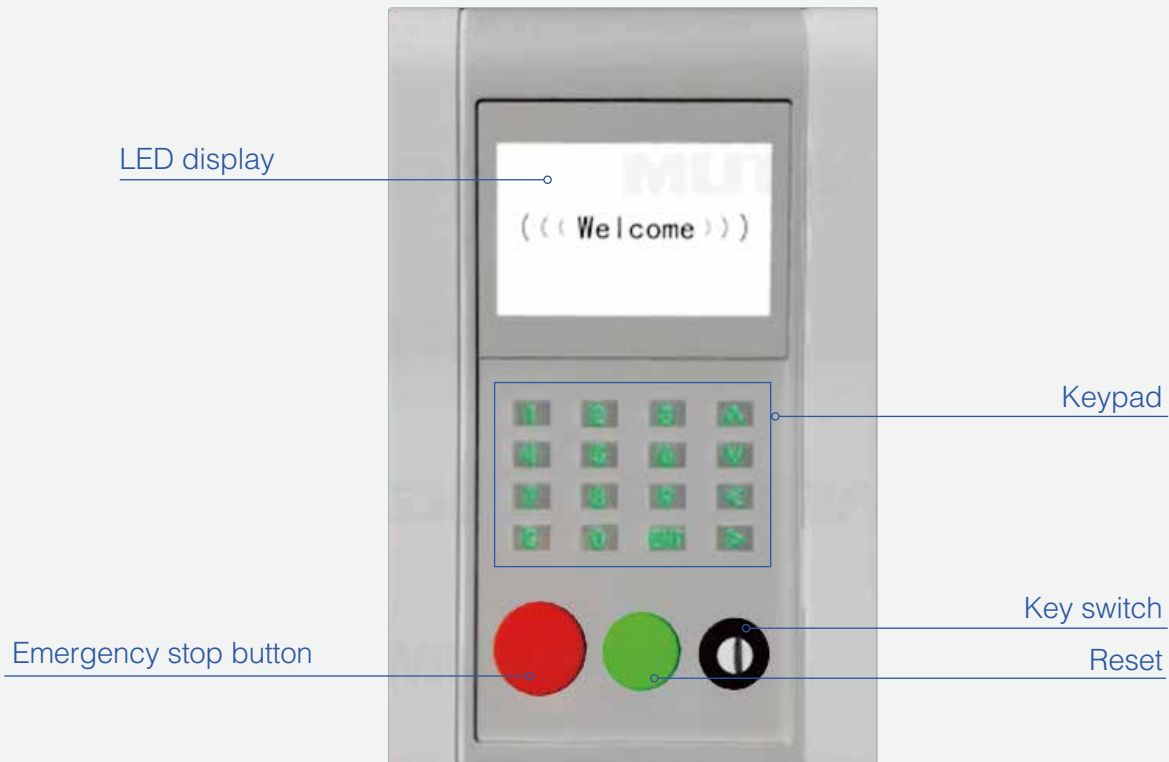
Space requirements	Clear platform width
B	
12425	2225
12800	2300
13300	2400

Operation

> Two ways to operate the system:

1. Code: input the space number of desired platform, then press RUN to start.
2. Card: users can swipe a specific card to get a certain platform down to the entrance level. Each card matches a specific platform.

Operation panel



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):
 - supervisor is essential for all operation of vehicle parking and retrieval
 - performance of technical system adjustments in necessary
 - consultation with Mutrade or local Mutrade partner is mandatory

Garage arrangement

Arrangement starts from 3 grids for 8 cars to maximum 11 grids for 32 cars.
The entrance level parking place row has one place less than the upper and lower level. The platform at the entrance floor level are shifted sideways by one space so that the empty space is above the lower level platform to be lifted, or below the upper level platform to be lowered.

Outdoor installation

For outdoor installation, façade covering at all sides as well as a roof are necessary.

Parking

- Drive the car backward onto the appropriate position of the platform. Collision with the control arm and side beams shall be avoided.
- Put the brake on after vehicle parked on the targeted position to avoid any accidental movement.
- Open the car door carefully to avoid any collision. Pay attention to the waving plates and side beams in case any falling down of person.
- Turning UP to lift the car to the appropriate position, and the platform will be locked automatically.
- Before another vehicle parked under platform, please check and make sure the nether vehicle is lower than platform height, to avoid any damage.

Noise protection

- 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/ m^2
- Solid ceiling above the parking systems with min. $m = 400$ kg/ m^2

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 noise protection:
If increased noise protection must be provided planning has to be confirmed on a project basis by Mutrade.

Drainage

Recommended drainage channels:

- Gutter in the pit center
- Connecting to a gully or drainage pit (500 x 500 x 200 mm)
- Installation of a pump or drainage channel into the sewerage system, to be performed by the customer

Environmental safety:

- Coating of the pit flooring is recommended
- Installation of an oil and / or petrol separator unit between the drainage connection and the main sewerage system is recommended

Temperature

- System operating range: -10 to +40C (with unloading platforms lowering speed is reduced if less than +5C)
- Humidity: 50% at +40C
- In the event of changes to system conditions please consult with Mutrade

Lighting

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

Fire safety

- All the safety requirements and all mandatory equipment (fire extinguisher and fire alarm system, etc.) must be performed by the customer

Railings

Railings mandatory:

- When exceeding the permissible, country-specific construction gaps and opening

Safety fences mandatory:

- When walkways resp. traffic passageways running alongside or behind Parklifts and / or systems positioned along border walls
- Safety fences according to ISO 13857 to be performed by the customer (also during the construction phase)

Maintenance

- Mutrade and all the Mutrade partners abroad provide an installation and customer service network
- Regular, annual maintenance is provided subject to the stipulation of a maintenance agreement

Protection against corrosion

- All operations listed in the Mutrade Cleaning and Maintenance Instructions are to be performed regularly (independently of maintenance operation)
- 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!

Construction alternations 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 progress or due to environmental regulation changes is also hereby reserved