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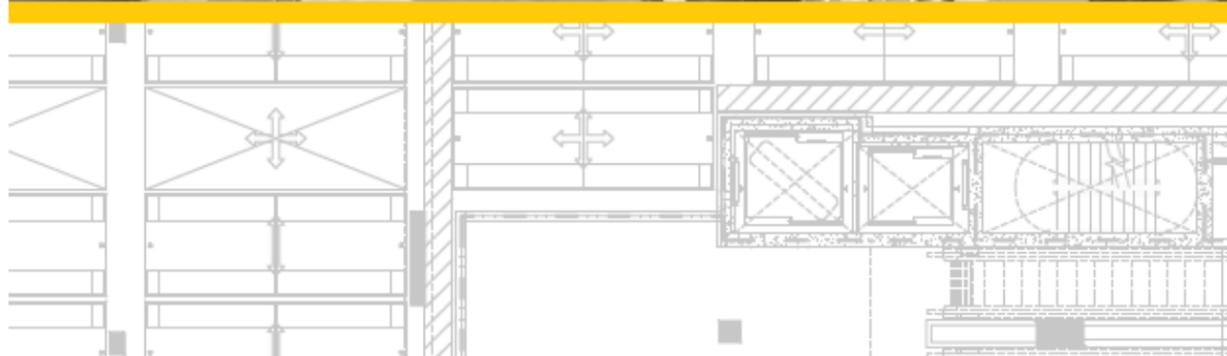
DRAWING INDEX

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11/29/2021

AX-000

U-tron Pace X-Shuttles



- U-tron X-Shuttles are horizontal transporting machines, which move the car laterally on the level, between the Side-lifts and the parking positions
- Multiple shuttles can occupy a level at any time.
- Shuttles can move between levels using the Side-lifts

Building interface

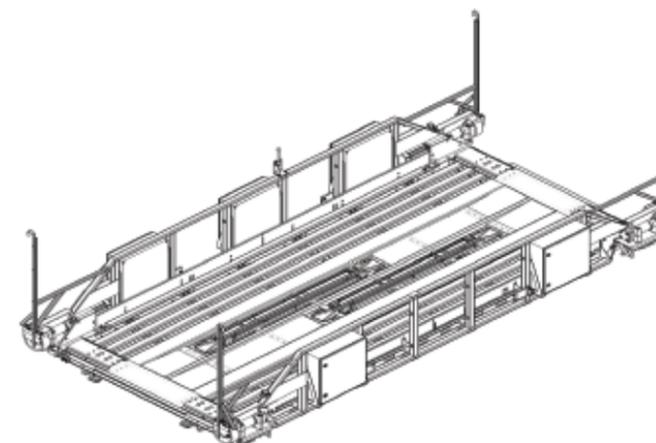
- The shuttles run on steel rails that are installed in the building (embedded in concrete), or are part of the steel structure
- Shuttles are fed from bus-bars (x4) installed on each level on the face of the rails

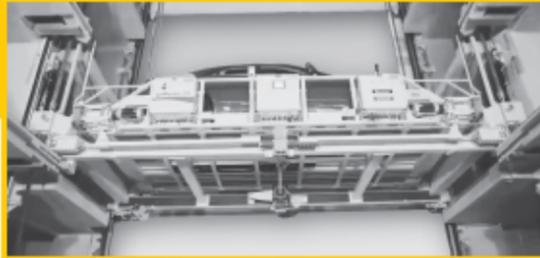
Function

- Each X-Shuttle carries two (2) Z-Shuttles (dollies) which move under the car, grab and raise the tires and move back on the shuttle
- The X-Shuttle moves to the designated position according to space availability
- Movement between levels is achieved via the Side-lifts.
- Adding X-Shuttles to the system increases throughput

Safety

- Shuttles are equipped with anti-collision sensors
- Light curtains ensure car is within shuttle boundaries
- Accurate positioning ensures cars are parked with minimal clearances





General specification

X-shuttle weight - 6,200 lbs.

Max. car weight - 6,600 lbs.

Weight fully loaded - 14,600 lbs.

(including two Z-shuttles)

Max. speed - 5 ft./s

Acceleration - 1.64 ft./s²

Power consumption - 15 kW

(480 V & 208 V variants available)

Travelling options - Concrete (steel embeds)

Rack (steel beam)

Required depth - 10'



Available sizes

- X-shuttles come in three standard sizes which are determined by the size of the vehicles entering the APS (Automated Parking System)
- Vehicles are divided into three classes, according to their size: Class A for Sedan, class B for mid-size SUV, and class C for full-size SUV

Vehicle class	Vehicle length	Internal rails width
Class A	17'-8"	17'-4"
Class B	18'-6"	18'-2"
Class C	19'-0"	18'-8"

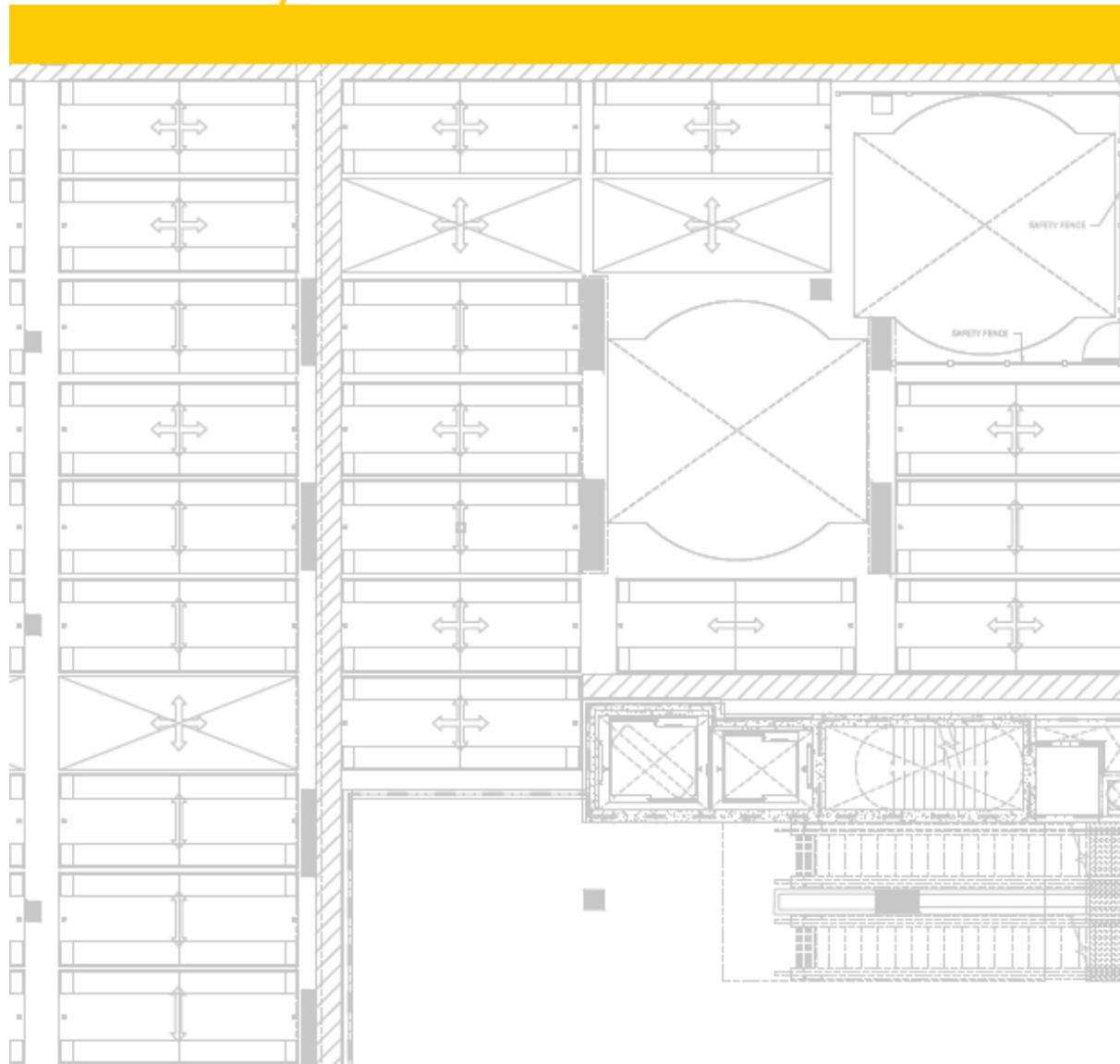
Height class	Vehicle height
Class A	5'-3"
Class B	6'-0"
Class C	6'-6"



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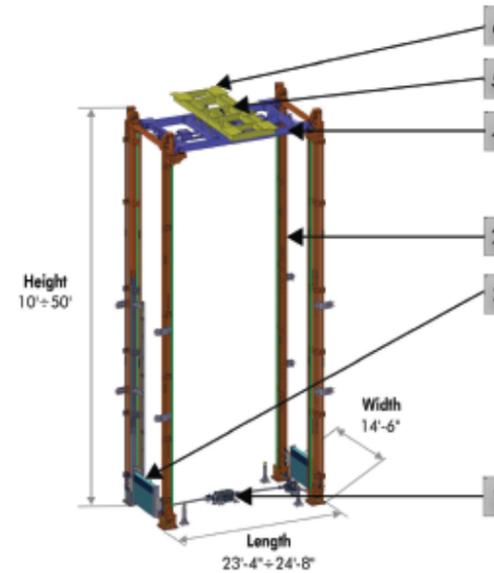
Bay Lift Slide



- U-tron Slide – 4 post lifts are used to transport pallets (all sizes) with or without vehicles between storage levels.
- The lift has two motors located at the bottom, and two counterweights located between each pair of posts.
- A conveyor with a rotating mechanism is installed on the lift, so a car pallet can be transported in or out of the APS (Automated Parking System). The rotating mechanism ensures that the vehicle returns to the driver rotated and facing the exit.

General specification – Lifting Unit	Data
Lift Dimensions	Length: 23'-4" ± 24'-8" (project specific) Pit depth: 5'-6" Width: 14'-6" Height: 10' ± 50" (project specific)
Weight	~14,000 lbs. (project specific)
Lift Platforms (include conveyor)	1800 lbs.
Pallet	6600 lbs.
Load Capacity (Vehicle)	~17,000 lbs. (project specific)
Counterweights (total)	3.28 ft./sec
Lift speed	1.64 ft./sec ²
Lift acceleration	3 RPM
Rotation speed	0.1 rad/sec ²
Angular acceleration	2
Number of motors	30 kW
Power consumption per motor (480V, 3 phase)	75 kW
VFD – Power requirement due to losses	100 kW
Nominal power consumption (with supplementary items)	up to 44' (project specific)
Vertical travel	270°
Rotating travel	
Supplementary items:	
VFD	
Rotating Mechanism	
Conveyor (+ transformer 480V>208V)	
Power supply	
Deck Locks	

- Max load on concrete slab including the lift structure, rotating mechanism, conveyor, pallet and vehicle: ~60,000 lbs. equally distributed on four (4) support posts = ~15,000 lbs. per post.
- Anchoring to concrete floor by welding the base plate to the embedded plate at the bottom of the pit.



Number	Component Description
1	"Y" motion system
2	Four posts
3	Two counterweights
4	Lift platform
5	Rotating mechanism
6	Turning frame



Fully automated parking solutions

Slide Conveyors



U-tron About U-tron Slide Conveyors

U-tron automated parking solutions are designed and constructed to utilize any given volume, optimizing the real estate to achieve the parking capacity within minimum space.

High-density parking is achieved by eliminating ramps and turning radii and eliminating the need for drivers/passengers for walking inside the structure. Our Automated parking solutions are in fact a flexible tool that enables designers to resolve parking challenges even in odd parking shapes.

U-tron Slide is a Conveyor-based Automated Parking system, also referred to as "Matrix" parking system. The system is composed of stationary conveyors performing multi-dimensional movements of vehicles stored on pallets, on a single/multi-level structure.

- U-tron SLIDE is a single/multi-level automatic parking system composed of lifts, conveyors, and entry/exit Bay rooms. U-tron SLIDE is designed to allow for flexible parking arrays on small and challenging sites.
- Cars are stored on pallets which are conveyed in a matrix array, for efficient and fast cycles.
- The conveyor arrays allow multi-path movements which increase the system's redundancy.
- The system is customizable for different vehicle dimensions, based on the available parking footprint.
- The system is designed to maximize the number of parking spaces while minimizing the parking level's footprint.
- Conveyors can be installed both on concrete slabs and on steel rack (designed and provided by U-tron).
- Leveling adjustment capability when installed on uneven concrete floor.
- The system is controlled by a management software and logic controllers. Using U-tron's proprietary control and software, the conveyors can be operated on different levels simultaneously.
- Optional add-ons for U-tron SLIDE project:
 - Pallet Drainage – A water drainage system that drains excess water that has accumulated on the pallets.
 - EV Charging System – An electric vehicle charging system built into some or all of the conveyors (designed and provided by U-tron).

Lateral Conveyor

Lateral conveyors transport the pallet in one axial direction along the short face of the conveyor.

The lateral drive wheels in the lateral conveyor are slightly higher than the longitudinal drive wheels in the longitudinal conveyor, to allow matrix transport of the pallets in both axial directions.

Lateral Conveyor	
Electrical Compatibility	1.5 kW, 3 phase, 400V/208V/480V
Number of motors	1
Pallet transport speed	1.3 ft./s (0.4 m/s)
Anchoring method	Injectable adhesive anchors
Number of anchors	12 anchors; 3/4" (M20) threaded rod
Anchoring embedment	7/8" (22 mm) hole diameter 4" (100 mm) drilling depth
Number of adjustable legs	32
Conveyor weight	1200 lb. (545 kg)
Conveyor length (L)	17'-0" (5175 mm)
Conveyor width (W)	7'-0" (2100 mm)
Conveyor height (ΔH)	Min*: 1'-1 3/4" (350 mm) Max**: 1'-4 1/2" (420 mm)
Conveyor height, with pallet (ΔH)	Min*: 1'-5 1/4" (438 mm) Max**: 1'-8" (508 mm)

* Minimum conveyor height based on the highest point on the floor (uneven concrete).
 ** Maximum conveyor height based on the lowest point on the floor (uneven concrete).



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 SYSTEM TECHNICAL DATA

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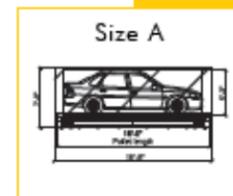
AX-103

Longitudinal Conveyor

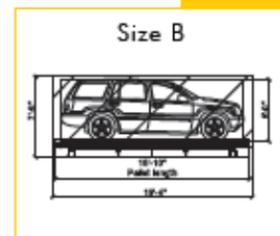
Longitudinal conveyors transport the pallet in one axial direction along the long face of the conveyor. The longitudinal drive wheels in the longitudinal conveyor are slightly lower than the lateral drive wheels in the lateral conveyor, to allow matrix transport of the pallets in both axial directions.

Longitudinal Conveyor	
Electrical Compatibility	1.5 kW, 3 phase, 400V/208V/480V
Number of motors	1
Pallet transport speed	1.3 ft./s (0.4 m/s)
Anchoring method	Injectable adhesive anchors
Number of anchors	4 anchors; 3/4" (M20) threaded rod
Anchoring embedment	7/8" (22 mm) hole diameter 4" (100 mm) drilling depth
Number of adjustable legs	40

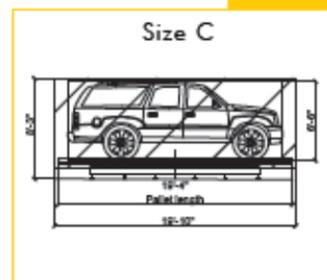
Class A	
Conveyor weight	1435 lb. (650 kg)
Conveyor length (L)	17'-0" (5175 mm)
Conveyor width (W)	6'-2" (1875 mm)
Conveyor height (ΔH)	Min*: 1'-1 1/4" (310 mm) Max** : 1'-2 3/4" (380 mm)
Conveyor height, with pallet (ΔH)	Min*: 1'-3 3/4" (398 mm) Max** : 1'-6 1/4" (468 mm)



Class B	
Conveyor weight	1470 lb. (665 kg)
Conveyor length (L)	17'-7" (5360 mm)
Conveyor width (W)	6'-2" (1875 mm)
Conveyor height (ΔH)	Min*: 1'-1 1/4" (310 mm) Max** : 1'-2 3/4" (380 mm)
Conveyor height, with pallet (ΔH)	Min*: 1'-3 3/4" (398 mm) Max** : 1'-6 1/4" (468 mm)



Class C	
Conveyor weight	1505 lb. (680 kg)
Conveyor length (L)	18'-9" (5715 mm)
Conveyor width (W)	6'-2" (1875 mm)
Conveyor height (ΔH)	Min*: 1'-1 1/4" (310 mm) Max** : 1'-2 3/4" (380 mm)
Conveyor height, with pallet (ΔH)	Min*: 1'-3 3/4" (398 mm) Max** : 1'-6 1/4" (468 mm)



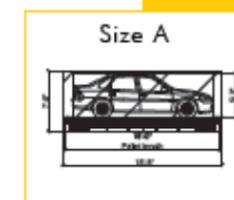
* Minimum conveyor height based on the highest point on the floor (uneven concrete).
** Maximum conveyor height based on the lowest point on the floor (uneven concrete).

Cross Conveyor

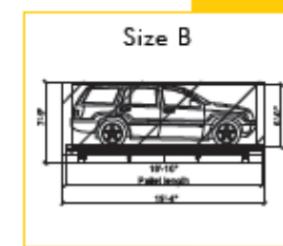
Cross conveyors transport the pallet in both longitudinal and lateral directions. This conveyor type has the ability to change the lateral drive wheels elevation to allow for direction change of the pallet's transportation axial direction.

Cross Conveyor	
Electrical Compatibility	1.5 kW, 3 phase, 400V/208V/480V
Number of motors	4
Pallet transport speed	1.3 ft./s (0.4 m/s)
Anchoring method	Injectable adhesive anchors
Number of anchors	4 anchors; 3/4" (M20) threaded rod
Anchoring embedment	7/8" (22 mm) hole diameter 4" (100 mm) drilling depth
Number of adjustable legs	48

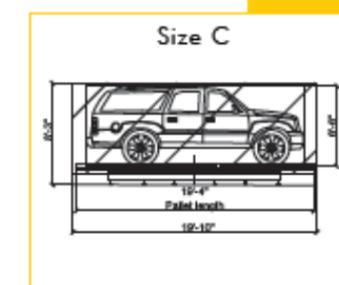
Class A	
Conveyor weight	2795 lb. (1270 kg)
Conveyor length (L)	17'-0" (5175 mm)
Conveyor width (W)	7'-0" (2100 mm)
Conveyor height (ΔH), Lateral	See Lateral Conveyor
Conveyor height (ΔH), Longitudinal	See Longitudinal Conveyor



Class B	
Conveyor weight	2830 lb. (1285 kg)
Conveyor length (L)	17'-7" (5360 mm)
Conveyor width (W)	7'-0" (2100 mm)
Conveyor height (ΔH), Lateral	See Lateral Conveyor
Conveyor height (ΔH), Longitudinal	See Longitudinal Conveyor



Class C	
Conveyor weight	2865 lb. (1300 kg)
Conveyor length (L)	18'-9" (5715 mm)
Conveyor width (W)	7'-0" (2100 mm)
Conveyor height (ΔH), Lateral	See Lateral Conveyor
Conveyor height (ΔH), Longitudinal	See Longitudinal Conveyor



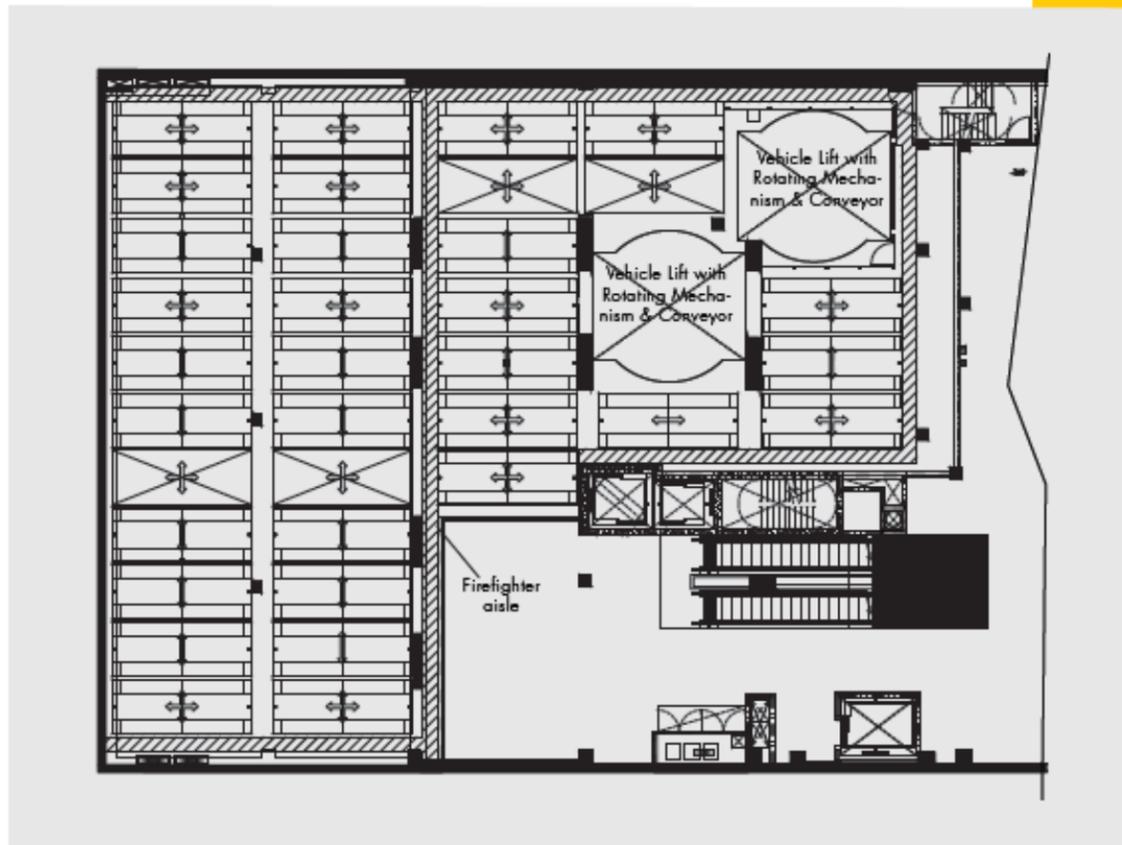
Car Pallets

Pallets come in four standard sizes, which allow vehicles of different sizes to enter the APS (Automated Parking System). The height limit of the vehicles in the APS is determined by several parameters, such as the height of the entrance door to the APS, structure layout, height clearance and the like.

Pallet Class	Conveyor Class	Length	Width
Size A* (IL)	A	17'-1" (5200 mm)	7'-3" (2200 mm)
Size B1	B	18'-0" (5486 mm)	7'-6" (2286 mm)
Size B2	B	18'-0" (5486 mm)	7'-8" (2337 mm)
Size C1	C	18'-10" (5740 mm)	7'-6" (2286 mm)
Size C2	C	18'-10" (5740 mm)	7'-8" (2337 mm)

* Size A (IL) is not EV compliant.

Sample floor layout - plan view - flexible design!



Cross conveyor



Lateral conveyor



Longitudinal conveyor



Pallet example



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