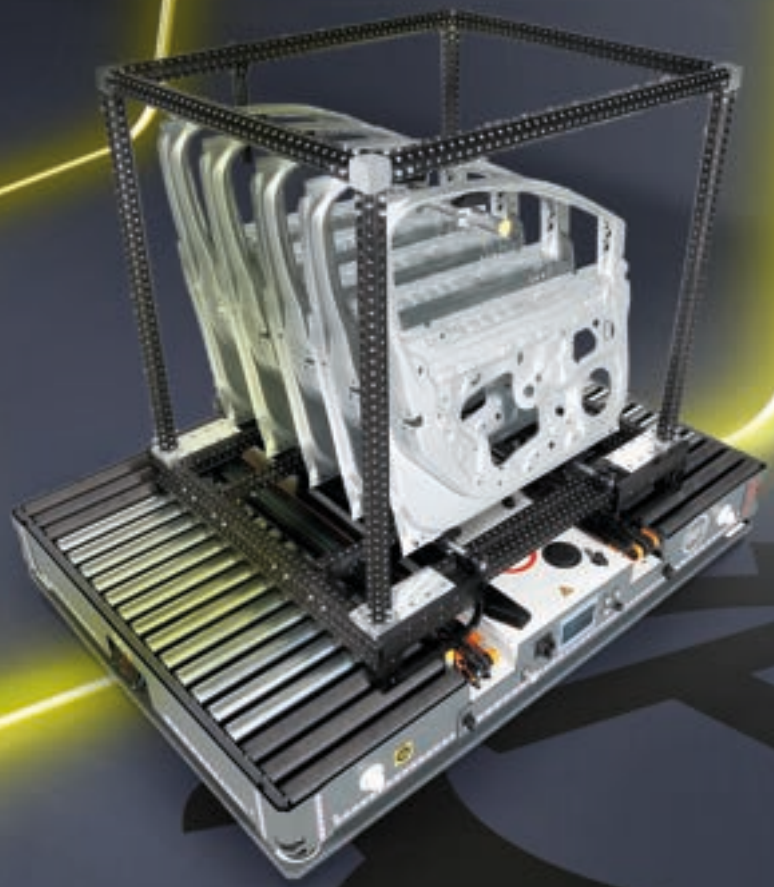
AUTONOMOUS TRANSPORTING



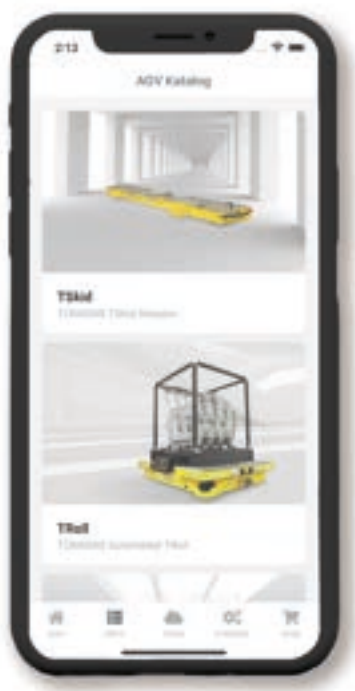
Transportieren
Transporting

TÜNKERS®
Ingenuity in series.

The new TÜNKERS-App

With the new TÜNKERS app you always have access to our complete range of automated guided vehicles and solutions for automation technology.

The app is easy to use and offers a variety of useful features such as an augmented reality viewer, a cataloge page scanner as well as access to the TÜNKERS hardware cloud, which allows you to view current data, data sheets as well as maintenance documents. Download the TÜNKERS app now.



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Inspiring technologies that span generations

TÜNKERS is a German family-owned company with many subsidiaries worldwide. We are a global player in automation technology. Together with our 1500 employees worldwide, we are driven by our joy of inventing, designing, and producing serial products.

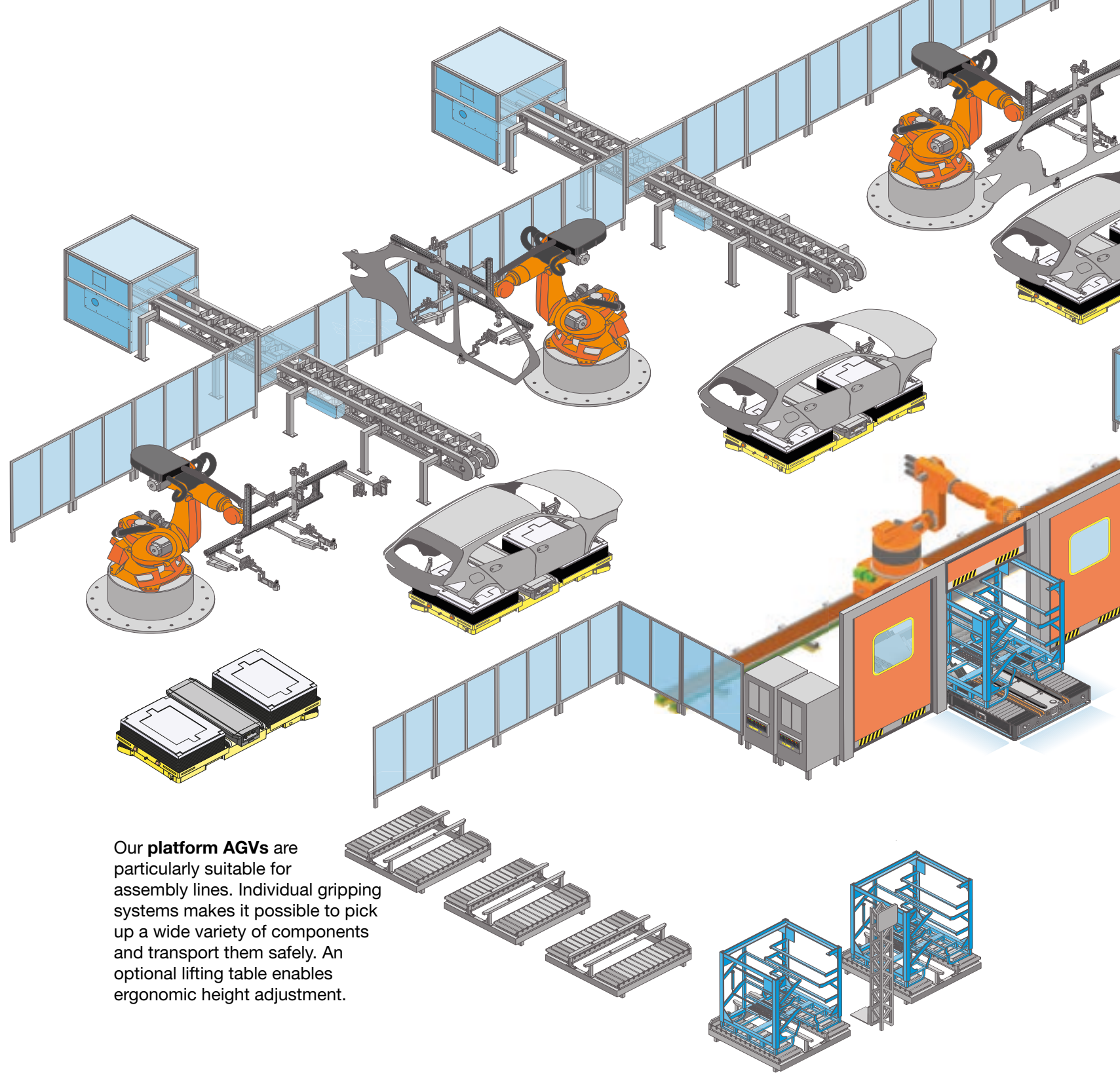
We have taken the next big step towards the future by entering the market for Automated Guided Vehicle (AGV).

The Automated Guided Vehicle are placed in the „Transporting" module of our 9 modules of the automation.

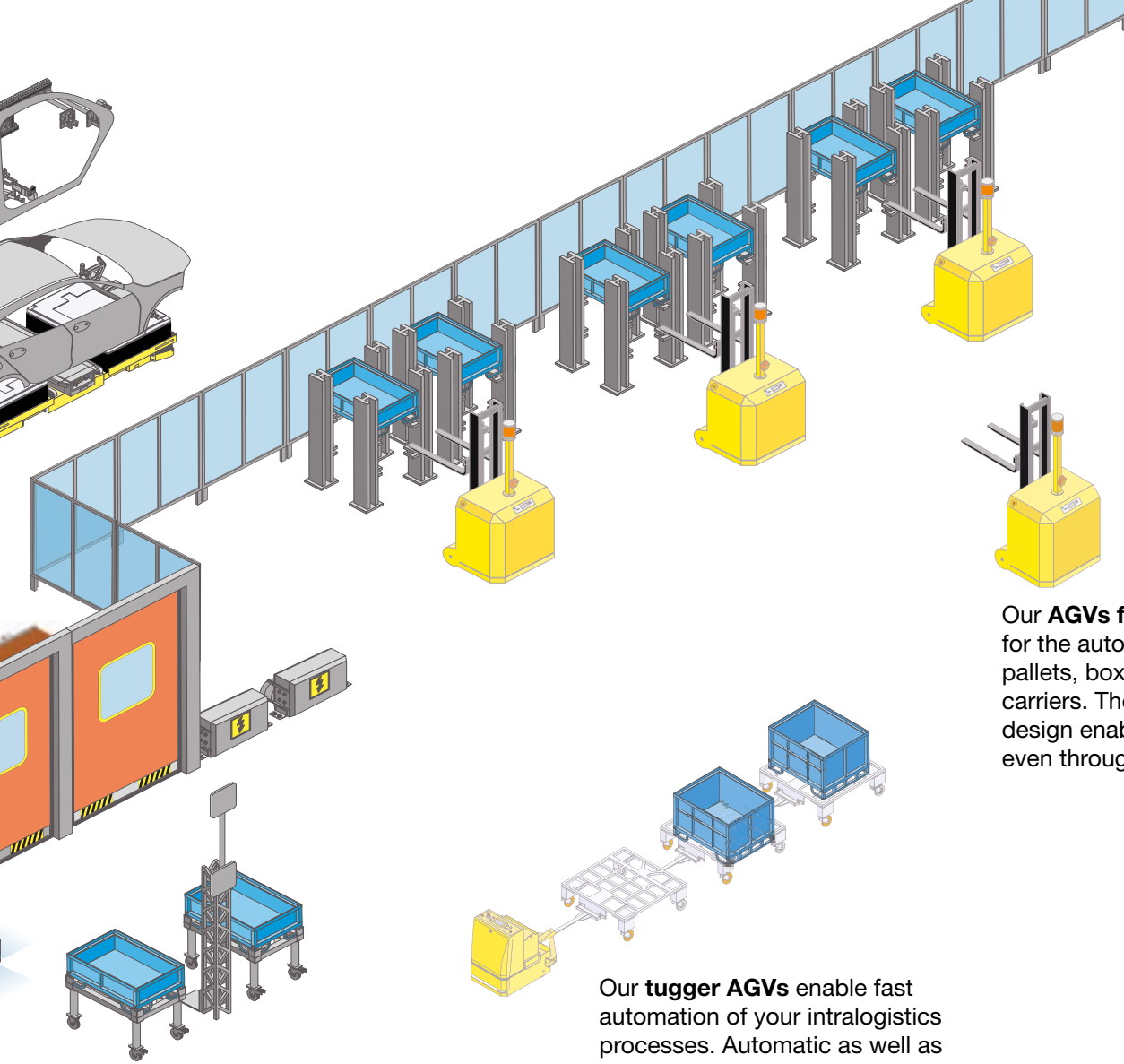
Our vehicles are characterised by cutting-edge technology and precision. The high flexibility of our systems enables us to realise a process according to your wishes.

Our serial production in Ratingen with a production capacity of up to 1000 vehicles per year and shift puts us in the optimal position for the future.

Do you want to use Automated Guided Vehicle in your projects as well? Contact us! We will be happy to advise and support you.

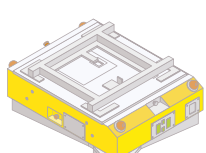


Our **platform AGVs** are particularly suitable for assembly lines. Individual gripping systems makes it possible to pick up a wide variety of components and transport them safely. An optional lifting table enables ergonomic height adjustment.

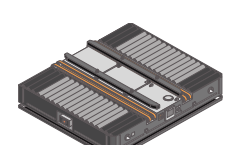


Our **AGVs forklifts** are optimised for the autonomous transport of pallets, boxes, and special load carriers. The robust and compact design enables safe navigation even through narrow aisles.

Our **tugger AGVs** enable fast automation of your intralogistics processes. Automatic as well as manual coupling is possible.



Our **Cart AGVs** are characterised by their high flexibility. Modular expansion is possible by using the 9 TÜNKERS automation modules.



Our **roller conveyor AGVs** are optimally suited for the transport of racks and special load carriers.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High-end AGVs

Modern AGVs are turning increasingly complex. They record navigation data via cutting-edge safety scanners or camera systems.

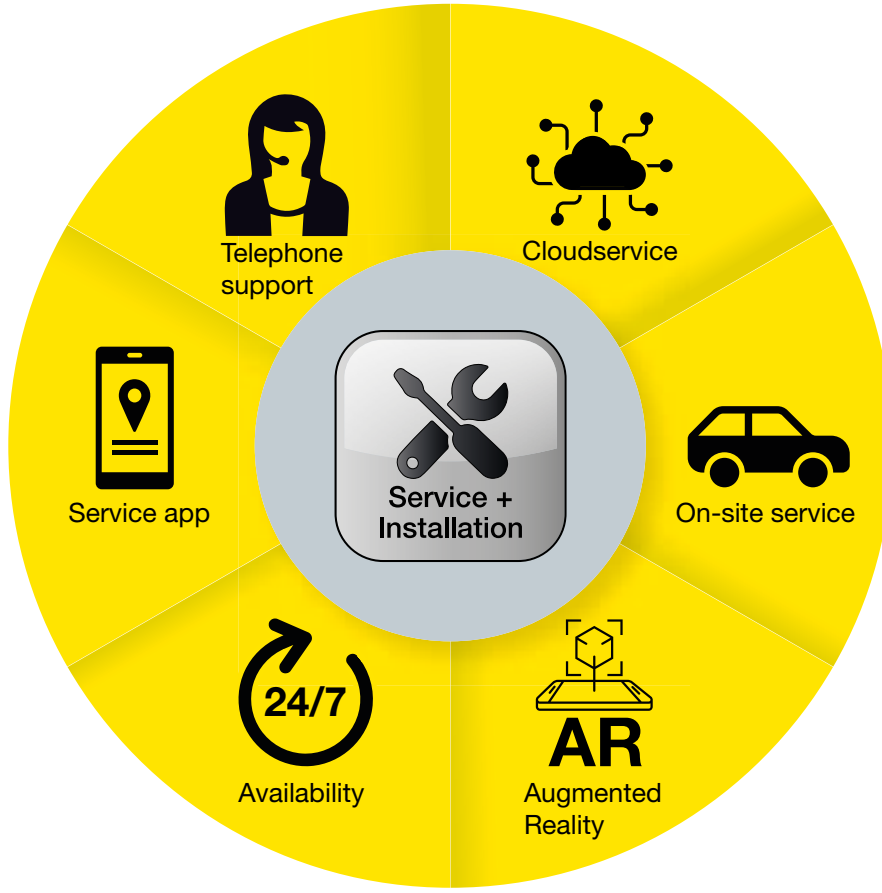
The data are evaluated by dynamic SLAM algorithms that determine the unit's position in the room and adapt to new environmental features. Using artificial intelligence, the system learns from the production facilities in the industrial environment and constantly optimises itself.

IWLAN connections enable secure communication between installations and safety systems. 3D cameras detect objects in space to prevent collision. Current data, data sheets, and maintenance documents can be displayed via the TÜNKERS hardware cloud by way of a QR code on the vehicle.

Service and maintenance

Thanks to the different service levels, TÜNKERS Maschinenbau GmbH can offer you a tailor-made service and maintenance package for all aspects of Automated Guided Vehicle systems.

Integration of the latest technologies as well as cloud service allows you to directly view the current status of the service or maintenance case



FREE NAVIGATION

The environment are captured by laser scanners and the position of the vehicle is determined by means of simultaneous localisation and mapping algorithm.

OTHER NAVIGATION TYPES:

Inductive

A track guidance system embedded in the floor with a frequency of 7 to 12 Hz enables navigation of the vehicles.

Magnet

A control circuit follows a magnetic track on the floor. Another option is using small magnets placed in a grid in the floor for navigation.

LASER REFLECTION

A laser scanner detects reflection marks along the route. The AGV position is determined by triangulation

Optical

A CCD camera in combination with a video converter detects a track or DMC codes on the ground.

Beacon

UWB or US beacons are installed in convenient locations in the plant. The position of the AGV is determined by triangulation.

GPS

This navigation uses GPS signals from satellites in combination with a reference station. This enables highly accurate positioning in the outdoor area.

TACT 1208

TÜNKERS AUTOMATED CART

The TÜNKERS Automated Cart TACT 1208 is a bidirectional, ramp-capable underride AGV, particularly characterised by its modular build. It adapts flexibly to different applications matching modules. This is made possible, among other things, by use of lifting table modules, gripper systems, roller conveyors, or accumulating conveyor systems.

PAYLOAD
1000 KG

RAMP CAPABILITY
8°

MOVEMENT

AUGMENTED REALITY
AR

TECHNICAL DATA	TACT 1208
Movement method	Bidirectional
AGV weight	480 kg
Payload	1000 kg
Dimensions	1200 x 878 x 370 mm
Ground clearance	30 mm
Ramp capability	8°
Load transfer system	Platform
Special equipment	Lifting table, lifting column, roller conveyor, gripper or accumulating conveyor system
IP rating	54
SPEED	
Driving speed	0 - 1.6 m/s
Maximum speed	2.0 m/s
NAVIGATION	
Navigation type	Free navigation
Accuracy	+/- 5 mm*
Supplementary navigation	Optional DMC navigation
Accuracy with additional navigation	+/- 3 mm*
Obstacle bypass	Optional*
VDA 5050 compatible	Yes
SAFETY	
Safety scanner	2D safety scanner
Scanning angle	360°
3D camera	Optional
Secure position	Optional
Safety WIFI	Optional
ACCUMULATOR	
Type	Lithium
Power	4.5 kW
Charging current	1C
VISUALISATION	
Driving visualisation	Yes
Acoustic notifications	Yes
Panel	Optional

*Depending on sensor and contour data

TACT 1610

TÜNKERS AUTOMATED CART

The TÜNKERS Automated Cart TACT 1610 is made particularly flexible by its omnidirectional driving mode. Similar to the TACT 1208, it can be expanded with by adding lifting table, gripper system, roller conveyor, or accumulating-conveyor system modules.

PAYLOAD
1000 KG

RAMP CAPABILITY
7°

MOVEMENT

AUGMENTED REALITY
AR

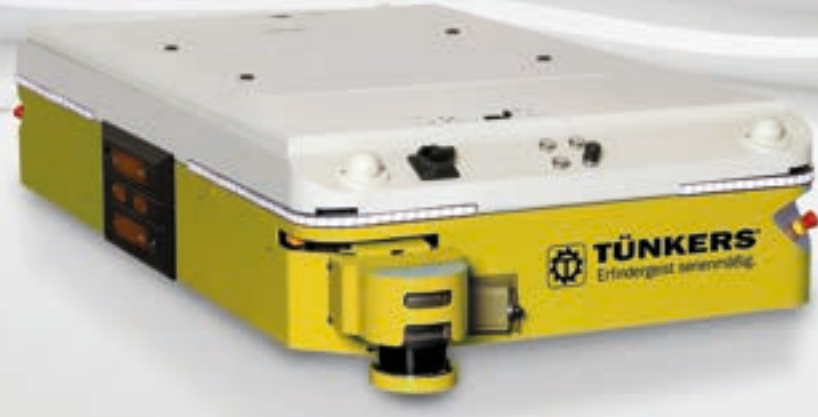
TECHNICAL DATA	TACT 1610
Movement method	Omnidirectional
AGV weight	730 kg
Payload	1000 kg
Dimensions	1600 x 1078 x 370 mm
Ground clearance	40 mm
Ramp capability	7°
Load transfer system	Platform
Special equipment	Lifting table, lifting column, roller conveyor, gripper or accumulating conveyor system
IP rating	54
SPEED	
Driving speed	0 - 1.6 m/s
Maximum speed	2.0 m/s
NAVIGATION	
Navigation type	Free navigation
Accuracy	+/- 5 mm*
Supplementary navigation	Optional DMC navigation
Accuracy with additional navigation	+/- 3 mm*
Obstacle bypass	Optional*
VDA 5050 compatible	Yes
SAFETY	
Safety scanner	2D safety scanner
Scanning angle	360°
3D camera	Optional
Secure position	Optional
Safety WIFI	Optional
ACCUMULATOR	
Type	Lithium
Power	4.5 kW
Charging current	1C
VISUALISATION	
Driving visualisation	Yes
Acoustic notifications	Yes
Panel	Optional

*Depending on sensor and contour data

TACT 1909

TÜNKERS AUTOMATED CART

The TÜNKERS Automated Cart TACT 1909 carries weights of up to 1t over ramps with inclines of up to 5°. The swivelling safety scanner mechanism patented by TÜNKERS allows driving through under particularly narrow objects with a maximum protective field of 360°. Shorter cycle times are achieved through omnidirectional driving.



PAYLOAD
1000 KG

RAMP CAPABILITY
5°

MOVEMENT

SWIVEL SCANNER

AUGMENTED REALITY
AR

TECHNICAL DATA	TACT 1909
Movement method	Omnidirectional
AGV weight	690 kg
Payload	1000 kg
Dimensions	1950 x 970 x 380 mm**
Ground clearance	30 mm
Ramp capability	5°
Load transfer system	Platform
Special equipment	Lifting table, lifting column, roller conveyor gripper or accumulating conveyor system
IP rating	54
SPEED	
Driving speed	0 - 1.6 m/s
Maximum speed	2.0 m/s
NAVIGATION	
Navigation type	Free navigation
Accuracy	+/- 5 mm*
Supplementary navigation	Optional DMC navigation
Accuracy with additional navigation	+/- 3 mm*
Obstacle bypass	Optional*
VDA 5050 compatible	Yes
SAFETY	
Safety scanner	2D safety scanner
Scanning angle	360°
3D camera	Optional
Secure position	Optional
Safety WIFI	Optional
ACCUMULATOR	
Type	Lithium
Power	4.5 kW
Charging current	1C
VISUALISATION	
Driving visualisation	Yes
Acoustic notifications	Yes
Panel	Optional

*Depending on sensor and contour data
**Deviation due to change of scanner position

TACT 2010

TÜNKERS AUTOMATED CART

The TÜNKERS Automated Cart TACT 2010 is particularly flexible due to its extremely flat design and its omnidirectional driving mode. Similar to the TACT 1610, it can be modularly extended by the use of a lift table, a gripper system, a roller conveyor or an accumulating conveyor.

PAYLOAD
1500 KG

MOVEMENT

AUGMENTED REALITY
AR

TECHNICAL DATA	TACT 2010
Movement method	Omnidirectional
AGV weight	520 kg
Payload	1500 kg
Dimensions	2000 x 1000 x 230 mm
Ground clearance	30 mm mm
Ramp capability	No
Load transfer system	Platform
Special equipment	Lifting table, lifting column, roller conveyor gripper or accumulating conveyor system
IP rating	54
SPEED	
Driving speed	0 - 1.5 m/s
Maximum speed	1,5 m/s
NAVIGATION	
Navigation type	Free navigation
Accuracy	+/- 5 mm*
Supplementary navigation	Optional DMC navigation
Accuracy with additional navigation	+/- 3 mm*
Obstacle bypass	Optional*
VDA 5050 compatible	Yes
SAFETY	
Safety scanner	2D safety scanner
Scanning angle	360°
3D camera	Optional
Secure position	Optional
Safety WIFI	Optional
ACCUMULATOR	
Type	Lithium
Power	2,5 kW
Charging current	1C
VISUALISATION	
Driving visualisation	Yes
Acoustic notifications	Yes
Panel	Optional

*Depending on sensor and contour data

TACT TOS

TÜNKERS TACT TOS

The TÜNKERS TACT TOS is one of the most modular vehicles in the range. Use of the TÜNKERS “OneScrew” technology enables individual construction according to customer requirements. The basic frame of the system is based on an octagonal profile with an offset hole pattern to provide a form fit. The connections are based on the standard TÜNKERS round tube components and are force-locked together. An extension with clamping technology enables easy fixing of components on the AGV.

MODULAR

TECHNICAL DATA	TACT TOS
Movement method	Bidirectional, omnidirectional
AGV weight	Variable depending on expansion
Payload	Variable depending on expansion
Dimensions	Variable depending on expansion
Ground clearance	30 mm
Ramp capability	No
Load transfer system	Platform
Special equipment	Clamping and linear technology, TOS System components
IP rating	20 - 54
SPEED	
Driving speed	0 - 1.6 m/s
Maximum speed	2.0 m/s
NAVIGATION	
Navigation type	Free navigation
Accuracy	+/- 5 mm*
Supplementary navigation	Optional DMC navigation
Accuracy with additional navigation	+/- 3 mm*
Obstacle bypass	Optional*
VDA 5050 compatible	Yes
SAFETY	
Safety scanner	2D safety scanner
Scanning angle	360°
3D camera	Optional
Secure position	Optional
Safety WIFI	Optional
ACCUMULATOR	
Type	Lithium
Power	6.6 kW
Charging current	1C
VISUALISATION	
Driving visualisation	Optional
Acoustic notifications	Optional
Panel	Optional

*Depending on sensor and contour data

TLIFT 2214

TÜNKERS AUTOMATED TLIFT

The TÜNKERS Automated TLift 2214 can be used particularly flexibly due to its omnidirectional driving mode. By using a double lift system, the simultaneous transport of empty and full load carriers is possible.

PAYLOAD

2x 1000 kg

MOVEMENT

AUGMENTED REALITY

AR

TECHNICAL DATA	TLIFT 2214
Movement method	Omnidirectional
AGV weight	1250 kg
Payload	2x 1000 kg
Dimensions	2286 x 1400 x 550 mm
Ground clearance	35 mm
Ramp capability	no
Load transfer system	Double Lifting Table
IP rating	54
SPEED	
Driving speed	0 - 1.6 m/s
Maximum speed	2.0 m/s
NAVIGATION	
Navigation type	Free navigation
Accuracy	+/- 5 mm*
Supplementary navigation	Optional DMC navigation
Accuracy with additional navigation	+/- 3 mm*
Obstacle bypass	Optional*
VDA 5050 compatible	Yes
SAFETY	
Safety scanner	2D safety scanner
Scanning angle	360°
3D camera	Optional
Secure position	Optional
Safety WIFI	Optional
ACCUMULATOR	
Type	Lithium
Power	4.5 kW
Charging current	1C
VISUALISATION	
Driving visualisation	Yes
Acoustic notifications	Yes
Panel	Optional

*Depending on sensor and contour data

TRoll

TÜNKERS Automated TRoll

The TÜNKERS Automated TRoll has an active chain gripping system that enables a fully automatic pick-up of large load carriers. The loading and unloading options on either side in combination with an omni-directional travel mode makes it particularly flexible in use. The optional 3D cameras reliably detect forklift tines in the room, for example. Digital LEDs visualise events and driving movements.

MOVEMENT

PAYLOAD

1300 KG

AUGMENTED REALITY

AR

TECHNICAL DATA	TRoll 2216	TRoll 2214	TRoll 3014
Movement method	Omnidirectional	Omnidirectional	Omnidirectional
AGV weight	1350 kg	1400 kg	1600 kg
Payload	1000 kg	1300 kg	1300 kg
Dimensions	2270 x 1662 x 450 mm	2286 x 1400 x 455 mm	3086 x 1400 x 455 mm
Transfer height	350 mm	350 mm	350 mm
Ground clearance	35 mm	35 mm	35 mm
Ramp capability	No	No	No
Load transfer system	Rollers with tele-scopic chain gripper system	Rollers with tele-scopic chain gripper system	Rollers with tele-scopic chain gripper system
IP rating	54	54	54
SPEED			
Driving speed	0 - 1.6 m/s		
Maximum speed	2.0 m/s		
NAVIGATION			
Navigation type	Free navigation		
Accuracy	+/- 5 mm*		
Supplementary navigation	Optional DMC navigation		
Accuracy with additional navigation	+/- 3 mm*		
Obstacle bypass	Optional*		
VDA 5050 compatible	Yes		
SAFETY			
Safety scanner	2D safety scanner		
Scanning angle	360°		
3D camera	Optional		
Secure position	Optional		
Safety WIFI	Optional		
ACCUMULATOR			
Type	Lithium		
Power	6.6 kW	4,5 kW	4,5 kW
Charging current	1C		
VISUALISATION			
Driving visualisation	Yes		
Acoustic notifications	Yes		
Panel	Optional		

*Depending on sensor and contour data

TRex

TÜNKERS Automated TRex

The TÜNKERS Automated TRex comes with an active belt conveyor to transport large load carriers on two levels. The load carriers are transferred fully automatically to the systems by an electrical system synchronisation. During the journey, the load carriers are securely fixed on the AGV by way of clamping technology.

PAYLOAD
1000 KG

MOVEMENT

AUGMENTED REALITY
AR

TECHNICAL DATA	TRex
Movement method	Omnidirectional
AGV weight	1400 kg
Payload	1000 kg
Dimensions	3400 x 1500 x 450 mm
Transfer height	350/400 mm
Ground clearance	30 mm
Ramp capability	No
Load transfer system	Belt conveyor
IP rating	20
SPEED	
Driving speed	0 - 1.0 m/s
Maximum speed	1.0 m/s
NAVIGATION	
Navigation type	Laser navigation
Accuracy	+/- 10 mm*
Supplementary navigation	No
Accuracy with additional navigation	
Obstacle bypass	No
VDA 5050 compatible	Yes
SAFETY	
Safety scanner	2D safety scanner
Scanning angle	360°
3D camera	Optional
Secure position	Optional
Safety WIFI	Optional
ACCUMULATOR	
Type	Lithium
Power	6.6 kW
Charging current	1C
VISUALISATION	
Driving visualisation	Yes
Acoustic notifications	Yes
Panel	Optional

*Depending on sensor and contour data

TSkid

TÜNKERS SKID ROBOT

The TÜNKERS Skid Robot transports fully automated Geoskids in the automotive industry. The active roller conveyor with flanges enables quick, precise, and safe horizontal component transport as well as transfer to elevating conveyors and roller conveyors. Precision tensioning technology keeps the Geoskid securely in position even on the move.

PAYLOAD
1000 KG

MOVEMENT

AUGMENTED REALITY
AR

TECHNICAL DATA	TSkid 7515	TSkid 5415	TSkid 3014
Movement method	Omnidirectional	Omnidirectional	Omnidirectional
AGV weight	1700 kg	1500 kg	1350 kg
Payload	1000 kg	1300 kg	1300 kg
Dimensions	7500 x 1500 x 450 mm	5400 x 1500 x 450 mm	3062 x 1400 x 455 mm
Transfer height	340 mm	340 mm	500 mm
Ground clearance	30 mm	30 mm	30 mm
Ramp capability	No	No	No
Load transfer system	Roller conveyor with flanges	Roller conveyor with flanges	Roller conveyor with flanges
IP rating	20	20	20
SPEED			
Driving speed	0 - 1.0 m/s		
Maximum speed	1.0 m/s		
NAVIGATION			
Navigation type	Free navigation		
Accuracy	+/- 5 mm*		
Supplementary navigation	Optional DMC navigation		
Accuracy with additional navigation	+/- 3 mm*		
Obstacle bypass	Optional*		
VDA 5050 compatible	Yes		
SAFETY			
Safety scanner	2D safety scanner		
Scanning angle	360°		
3D camera	Optional		
Secure position	Optional		
Safety WIFI	Optional		
ACCUMULATOR			
Type	Lithium		
Power	6.6 kW		
Charging current	1C		
VISUALISATION			
Driving visualisation	Yes		
Acoustic notifications	Yes		
Panel	Optional		

*Depending on sensor and contour data

STacker

TÜNKERS STACKER

The confident TÜNKERS STacker is able to move in narrow aisles with high precision. It places its load carriers precisely in transfer stations. The counterweight principle enables transfer even in locations that are difficult to access. With an optional fork adjustment, it adapts flexibly to the load carriers.

PAYLOAD
1500 KG

MOVEMENT

AUGMENTED REALITY
AR

TECHNICAL DATA	STacker
Movement method	Bidirectional
AGV weight	2900 kg
Payload	1500 kg with 700 mm load centre of gravity
Dimensions	2700 x 1160 x 2100 mm**
Transfer height	flexible
Ground clearance	40 mm
Ramp capability	No
Load transfer system	Forklift tines
Special equipment	Fork adjustment, telescopic tines, load carrier monitoring
IP rating	54
SPEED	
Driving speed	0 - 1.6 m/s
Maximum speed	1.6 m/s
NAVIGATION	
Navigation type	Free navigation
Accuracy	+/- 5 mm*
Supplementary navigation	Optional DMC navigation, pallet pocket detection
Accuracy with additional navigation	+/- 3 mm*
Obstacle bypass	Optional*
VDA 5050 compatible	Yes
SAFETY	
Safety scanner	2D safety scanner
Scanning angle	360°
3D camera	Optional
Safe position sensing	Optional
Safety WIFI	Optional
ACCUMULATOR	
Type	Lithium
Power	6.6 kW
Charging current	1C
VISUALISATION	
Driving visualisation	Yes
Acoustic notifications	Yes
Panel	Optional

*Depending on sensor and contour data
**Differences possible by changing the LHE

S-ANT

TÜNKERS S-ANT

The TÜNKERS S-Ant is a pallet mover that enables fully automated transport of pallets and boxes. The draw-bar control allows easy switching between automatic and manual operation.

TECHNICAL DATA	S-ANT
Movement method	Bidirectional
AGV weight	1330 kg
Payload	1000 kg with 700 mm load centre of gravity
Dimensions	2835 x 1160 x 2375 mm**
Transfer height	flexible
Ground clearance	35 mm
Ramp capability	No
Load transfer system	Forklift tines
Special equipment	Fork adjustment, telescopic tines, load carrier monitoring
IP rating	20
SPEED	
Driving speed	0 - 1.6 m/s
Maximum speed	1.6 m/s
NAVIGATION	
Navigation type	Free navigation
Accuracy	+/- 5 mm*
Supplementary navigation	Optional DMC navigation, pallet pocket detection
Accuracy with additional navigation	+/- 3 mm*
Obstacle bypass	Optional*
VDA 5050 compatible	Yes
SAFETY	
Safety scanner	2D safety scanner
Scanning angle	360°
3D camera	Optional
Safe position sensing	Optional
Safety WIFI	Optional
ACCUMULATOR	
Type	Lithium
Power	6.6 kW
Charging current	1C
VISUALISATION	
Driving visualisation	Yes
Acoustic notifications	Yes
Panel	Optional

*Depending on sensor and contour data
**Differences possible by changing the LHE

CARSET

TÜNKERS AUTOMATED CARSET

The TÜNKERS AUTOMATED CARSET is used for the manual and semi-automated transport of components and tools on the assembly lines.

TECHNICAL DATA	CARSET
Movement method	Bidirectional
AGV weight	Variable depending on expansion
Payload	Variable depending on expansion
Dimensions	Variable depending on expansion
Ground clearance	30 mm
Ramp capability	No
Load transfer system	Manually
IP rating	54
Drive mode	Manually, automatically
Drive	Electric drive wheel with lift-lower function
SPEED	
Driving speed	0 - 1 m/s
Maximum speed	0 – 0,3 m/s
NAVIGATION	
Navigation type	Rail-guided, incl. Sensor detection
Manual operation	Worker operated
OPERATING ELEMENTS	
Operating elements	Button (Manual support, automatic and reset)
Thumb throttle	Yes
SAFETY	
Safety scanner	2D Safety scanner
Scanning angle	150°
Emergency stop	Yes
ACCUMULATOR	
Type	Lithium
Power	672 Wh
Charging current	0,5C
Charging concept	Automatically, manually changeable
VISUALISATION	
Driving visualisation	Optional
Acoustic notifications	Yes
Panel at CARSET	Optional

Infrastructure

Trailer-Station:
By moving the barrier, the operator gives the go-ahead for the trailer to be picked up.

TECHNICAL DATA	
Dimensions	254 x 2800 x 900 mm
Optional	Ampel, Not-Halt, SQW Erkennung

Modular-Trailer:
The use of TÜNKERS One Screw technology (TOS) enables a modular trailer design according to customer requirements.

TECHNICAL DATA	
Dimensions	Variable depending on expansion
Weight	Variable depending on expansion
Payload	Variable depending on expansion

Roller-Table:
The transfer table is equipped with a passive roller conveyor on which racks can be placed either fully automatically using an AGV or manually using a forklift.

TECHNICAL DATA	CONFIGURATION 1	CONFIGURATION 2	CONFIGURATION 3
Dimensions	1252 x 1274 x 505 mm	2170 x 1274 x 505 mm	2885 x 1274 x 505 mm
Payload	1300 kg	1300 kg	1300 kg
Optional	Traffic light, container detection, emergency stop, safety laser scanner, return pawl		

Forklift-Shelf:
The forklift-shelf, has three levels on which racks can be stored either fully automatically with the help of the STacker or manually using a forklift.

TECHNICAL DATA	
Dimensions	2848 x 1740 x 1212 mm
Payload	1000 kg in each compartment
Optional	Traffic light, emergency stop, container detection

Manual-Trolley-Station:
With the manual transfer trolley, a STacker or forklift can be stored trailers, pallets and boxes fully automatically or manually.

TECHNICAL DATA	
Dimensions	1143 x 810 x 2751 mm
Weight	285 kg
Payload	1000 kg
Optional	Traffic light, emergency stop, container detection, return pawl

Rack-Station:
The rack can be loaded fully automatically using an AGV or manually using a forklift.

TECHNICAL DATA	
Dimensions	Depending on the structure
Payload	1500 kg
Optional	Traffic light, emergency stop, container detection,

Periphery

Charging Station:
Suitable for charging batteries with integrated battery management system. An active coupling between FTF and charging station is possible.

TECHNICAL DATA	
Dimensions	450 x 264 x 235 mm
Output	9kW

Traffic light:
The TÜNKERS traffic light optimizes the intralogistic traffic flow, with the help of the countdown function the length of the red phase is displayed.

TECHNICAL DATA	
Dimensions	480 x 210 x 30 mm
Connectionl	M12 plug, 4-polig, A-coded
Electrical data	24V / 16W

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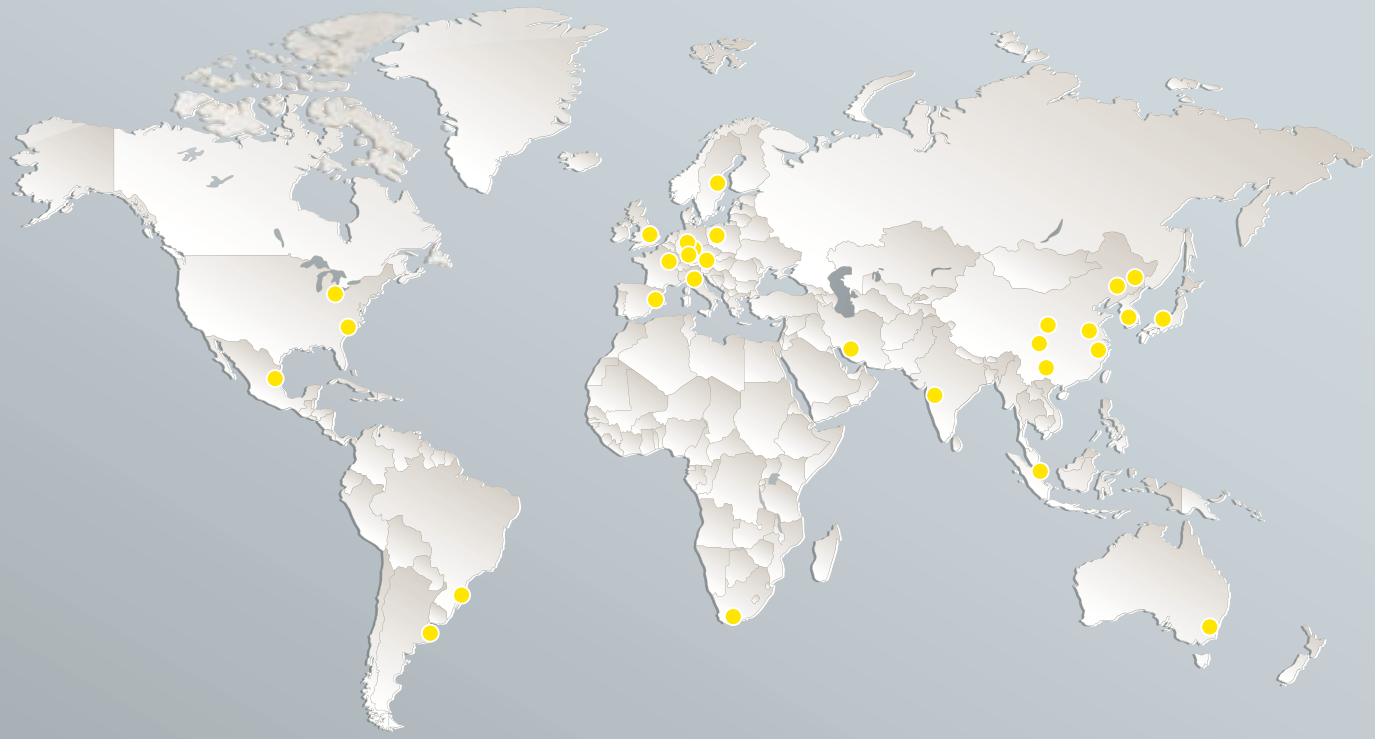

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