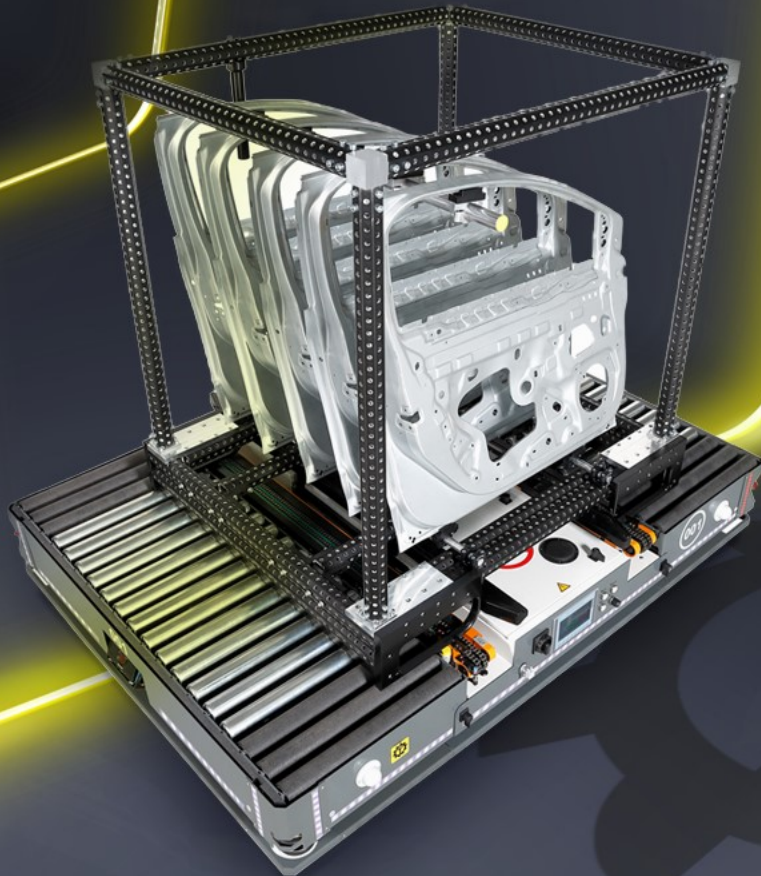




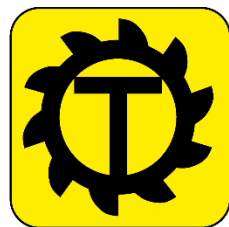
AUTONOMOUS **TRANSPORTING**



TÜNKERS Maschinenbau GmbH

Founded:	1962 by J.G. Tünkers
Owned by:	Family Tünkers
Management:	J.G. Tünkers Olaf Tünkers André Tünkers
Employees:	1.500
Areas:	Total: 36.900 m ² Office: 3.300 m ² Production: 12.500 m ²
Headquarters:	Industrial area close to International Airport Düsseldorf
Capacity	300.000 components+ systems / year 1.000 AGV /per year and shift





TÜNKERS®

Erfindergeist serienmäßig.



EXPERT®
Takten & Positionieren.



SOPAP
Automation.



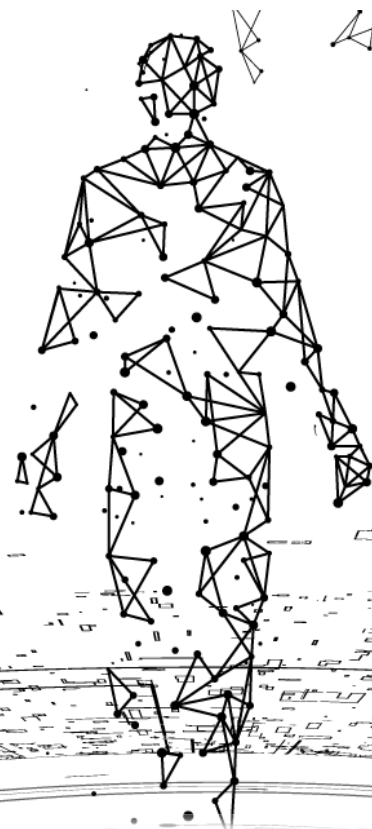
APM SISTEMAS
Fördertechnik.



HELU
Schweißtechnik.



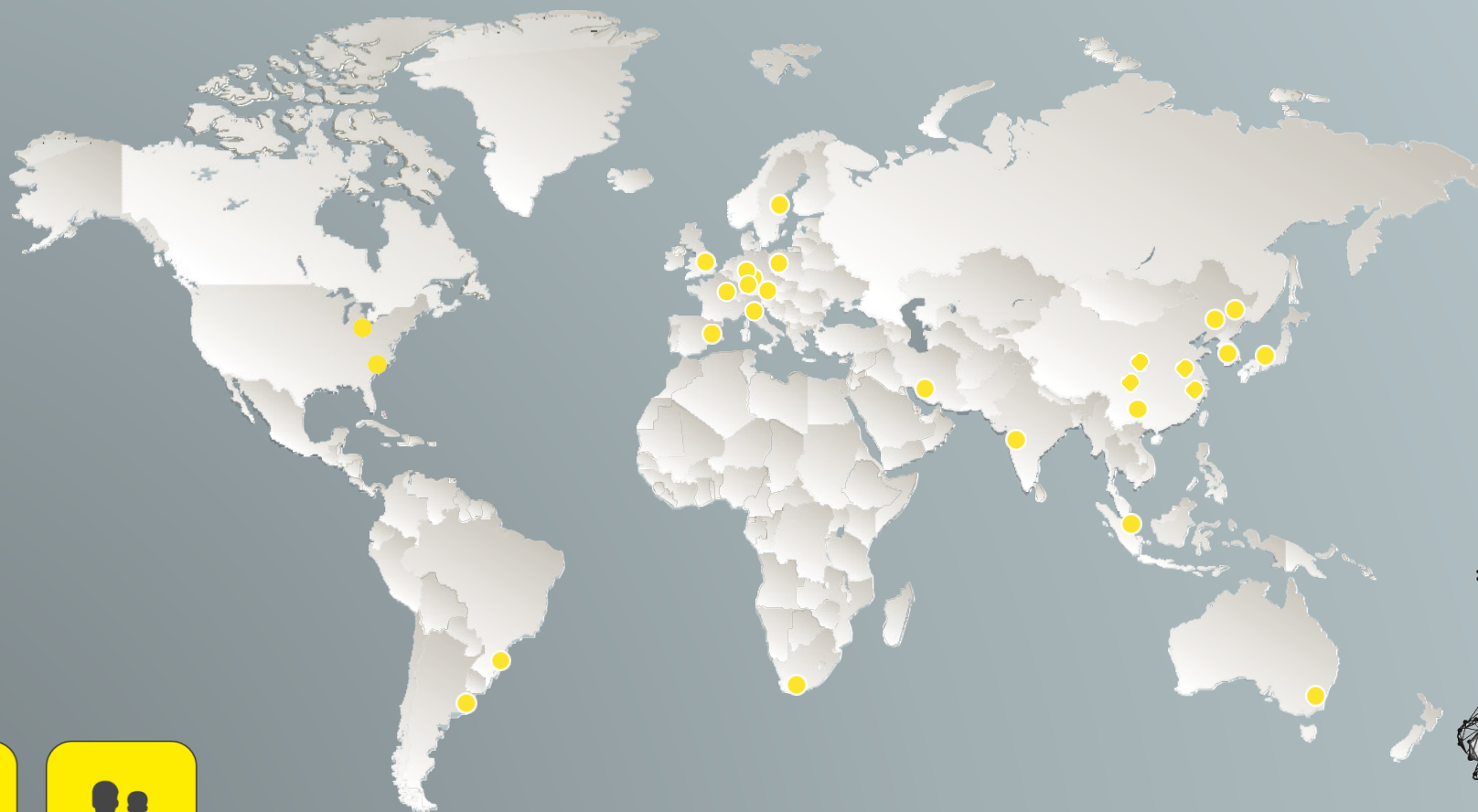
NIMAK®
Die perfekte Verbindung.



STRONG BRAND



There for you around the World



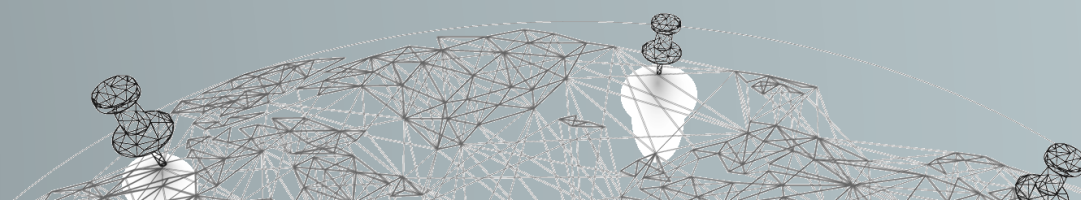
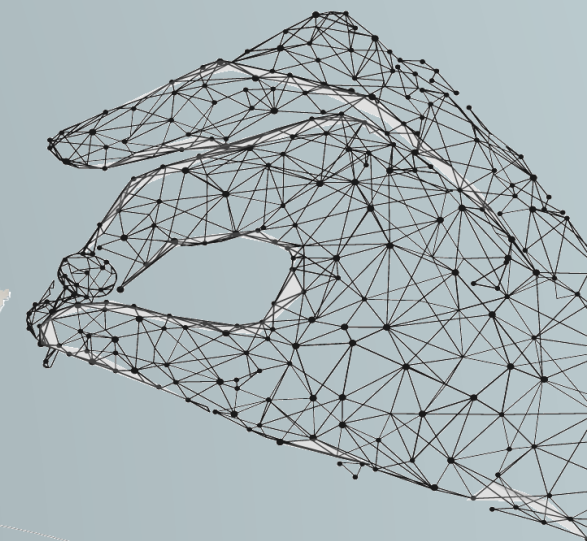
25
Sales offices



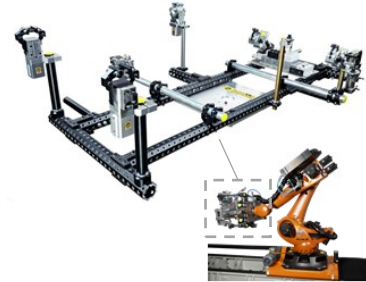
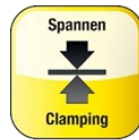
12
Plants



8
Sales partners



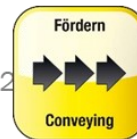
MODULS



SOPAP
Automation.



EXPERT
Takten & Positionieren.



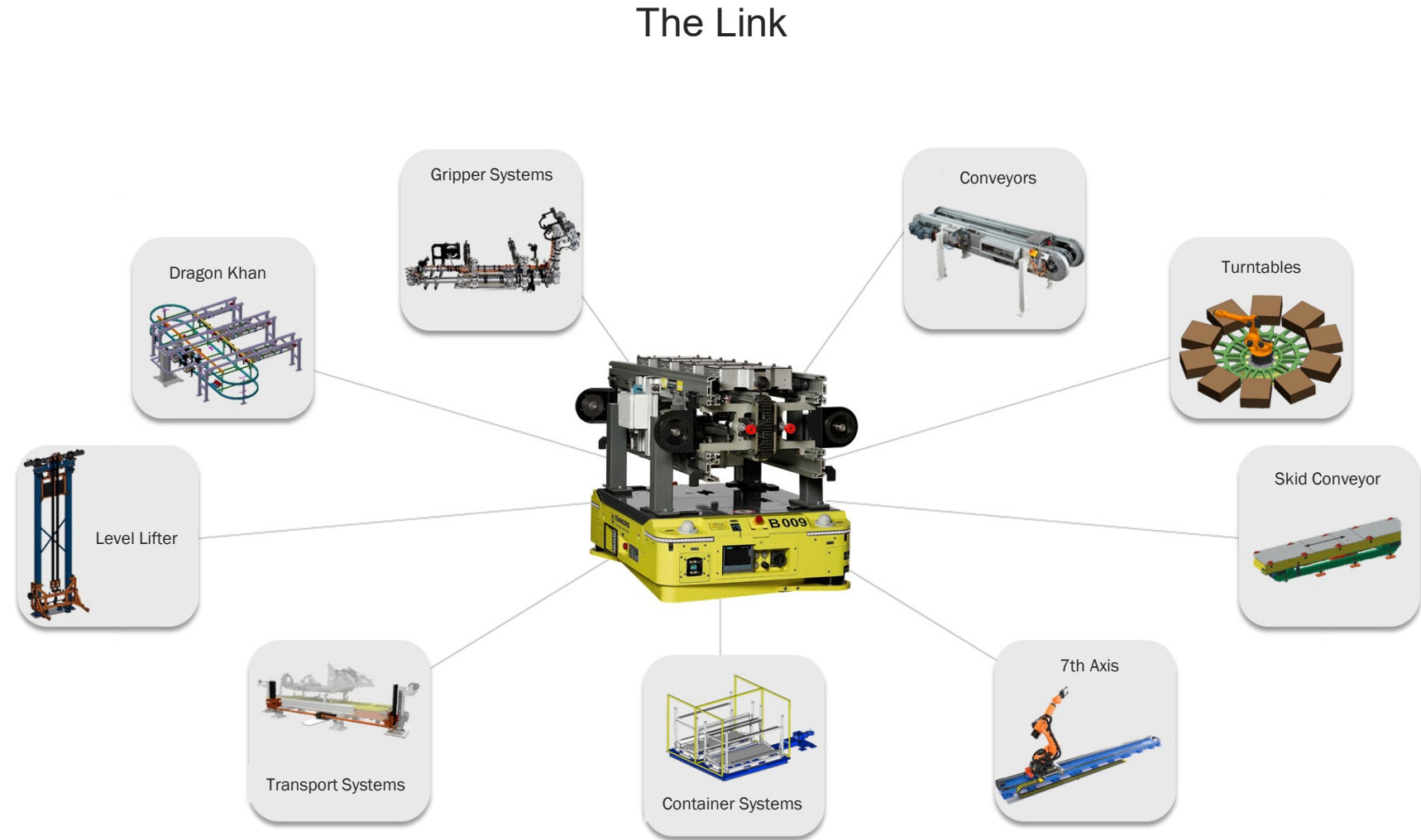
2

APM SISTEMAS
Fördertechnik.



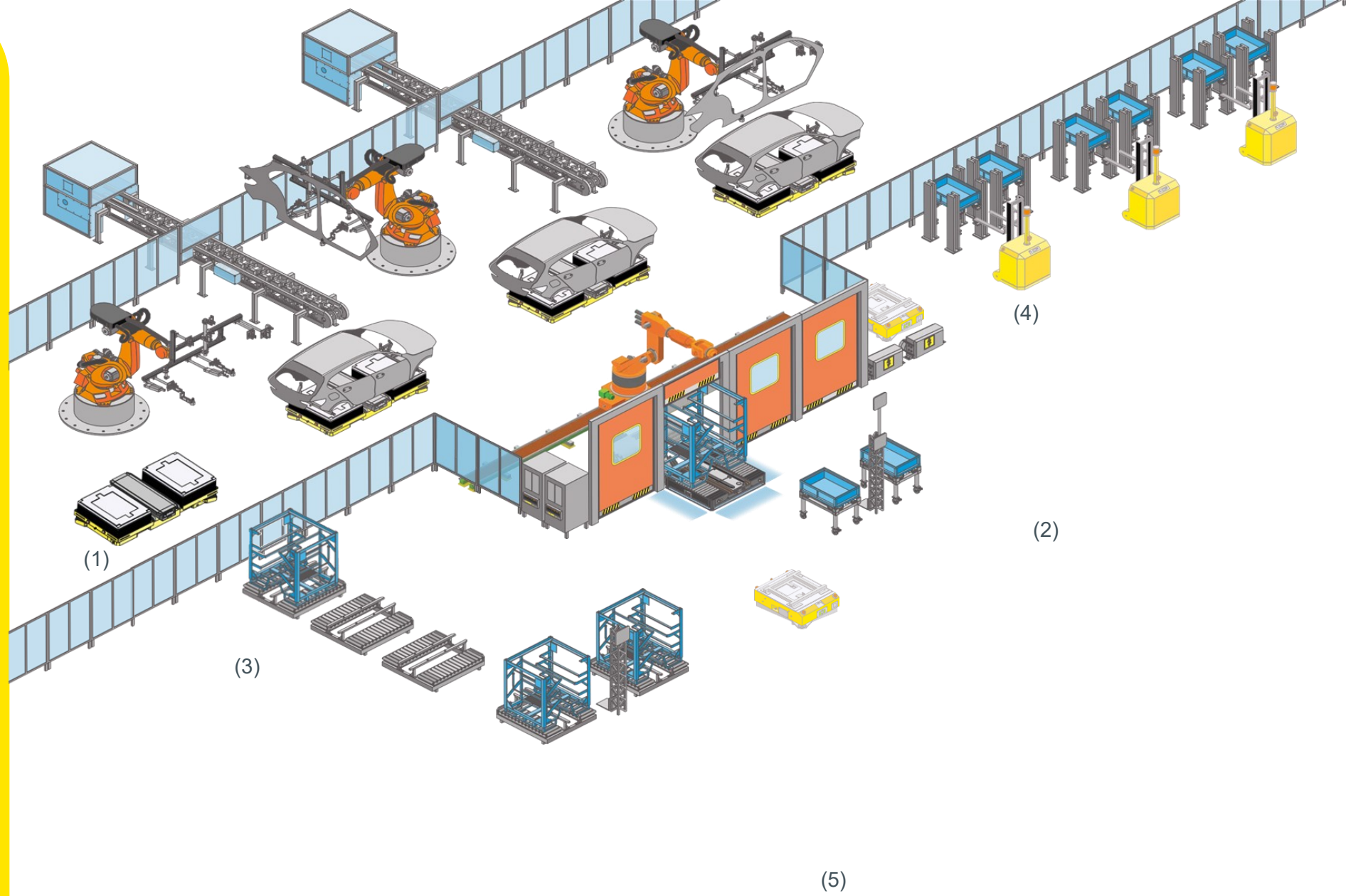


Industrial Logistic Robots



AGV-Types

- (1) Platform
- (2) Cart
- (3) Roller conveyor
- (4) Forklift
- (5) Tugger



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.



LASER REFLECTION



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



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.



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.



Calibration

For more than 60 years, we have been the topic of positioning.

Innovative calibration processes ensure consistently high fleet accuracy.

No individual teaching of the transfers

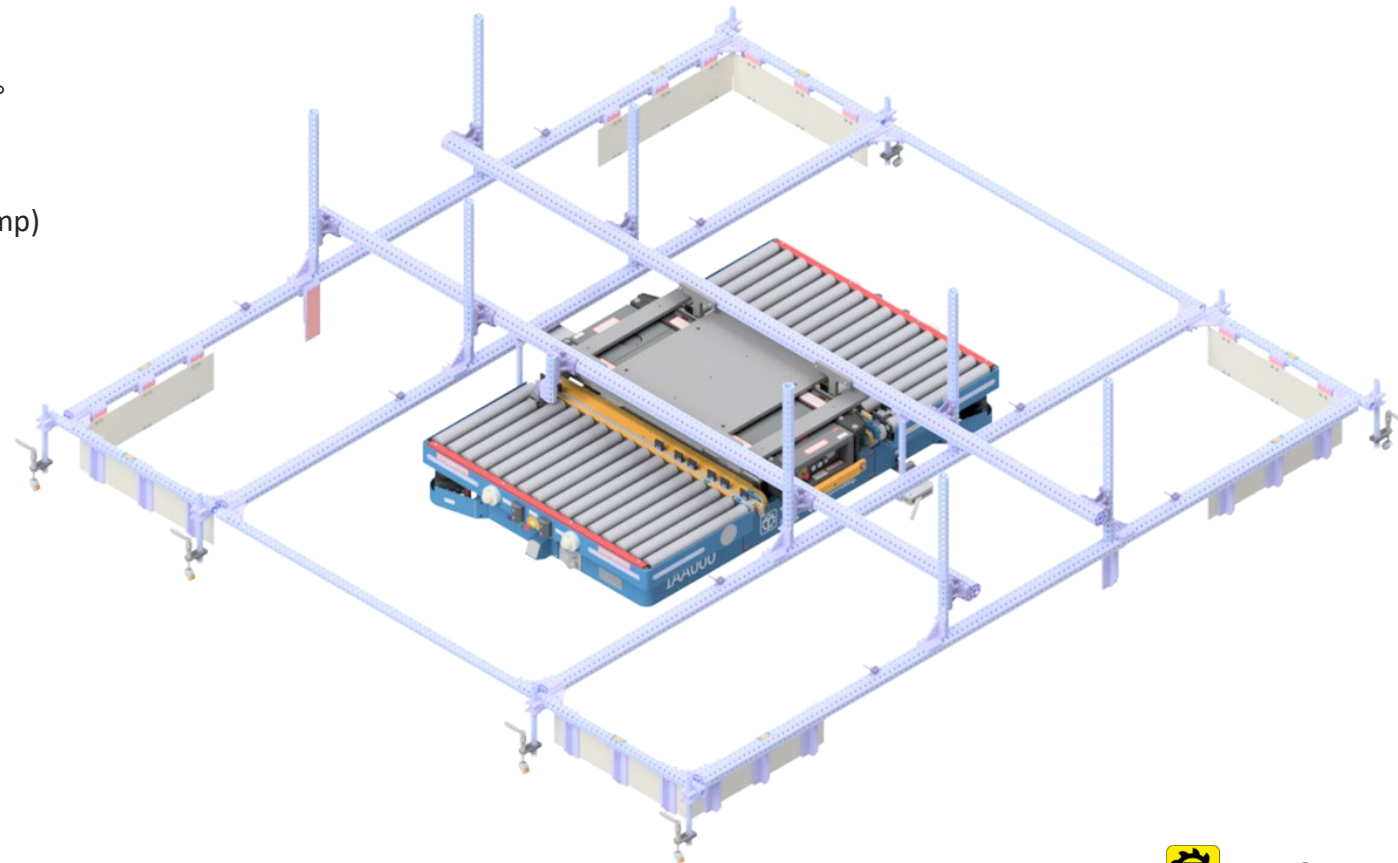
All sensors that affect the position of the vehicle are calibrated.

Position Accuracy*:

Free navigation: $\pm 5\text{mm}$ $\pm 1^\circ$

DMC: $\pm 3\text{mm}$ $\pm 1^\circ$

MCP: $\pm 0.2\text{mm}$ (external Clamp)



Products – for industrial applications only...

TACT 1610:



TACT 1208:



TACT 1206:



TACT 2010:



SStacker:



TROLL 2214:



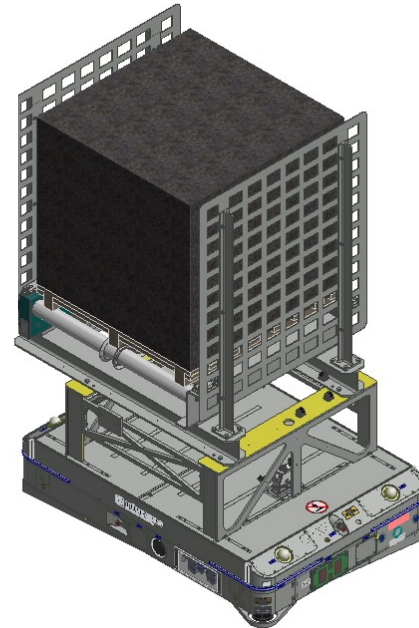
S-Ant:



TROLL 3014:

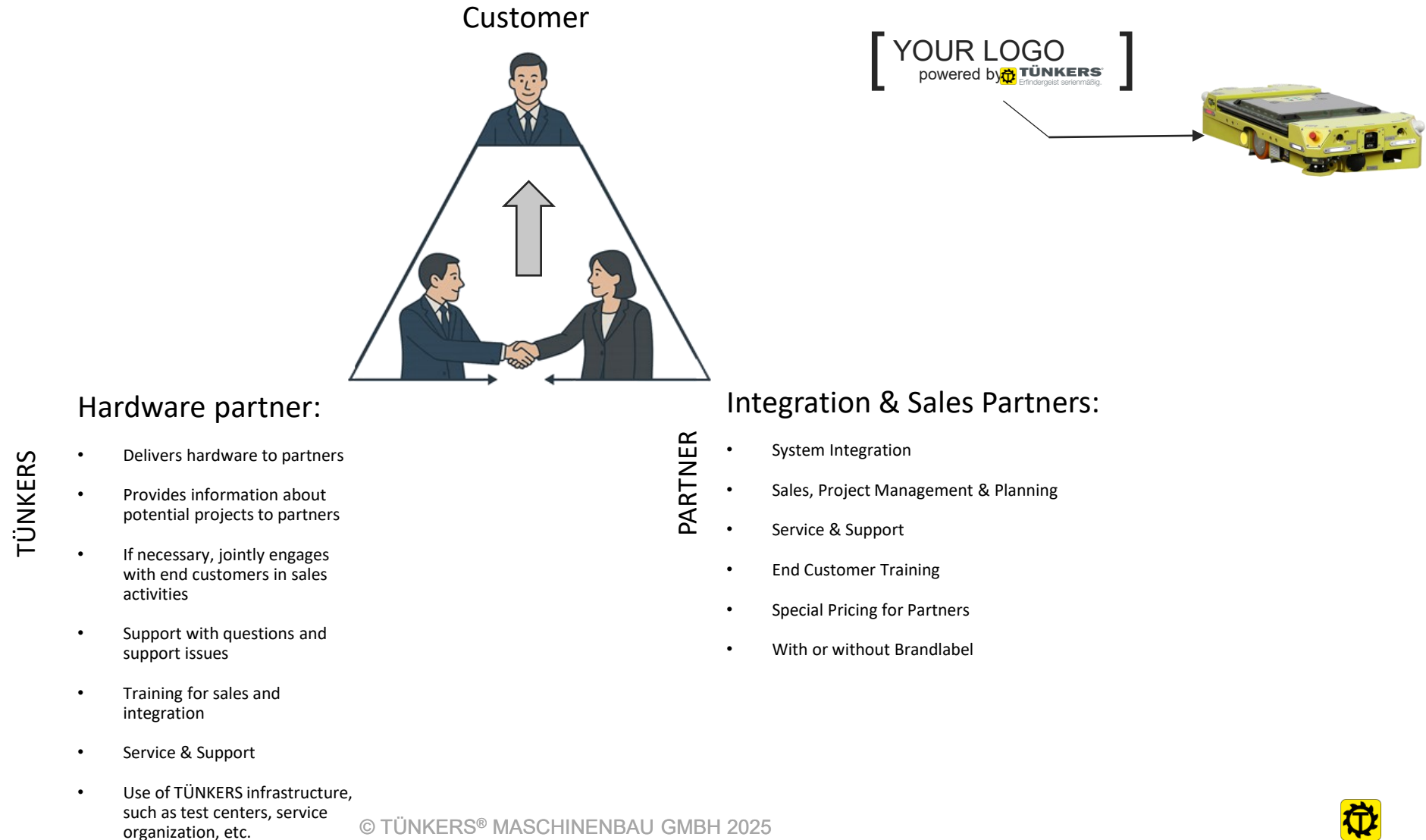


TLIFT 2214:



- ✓ Sturdy
- ✓ Easy to repair
- ✓ Easy Controlling
- ✓ Easy integration
- ✓ Minimal Height
- ✓ Maximum Payload 0,5 -3,5 to

Integration with modular system



TACT 1206 / TACT 1206 LC

TÜNKERS AUTOMATED CART

The Tünkers Automated Cart TACT 1206 impresses with its extremely compact design paired with a high power density. Similar to the TACT 1208, it can be modularly expanded by the use of a lift table, a gripper system, a roller conveyor or an accumulating conveyor.



TECHNISCHE DATEN	TACT 1206
Fahrweise	Bidirektional
FTF Gewicht	200 kg
Zulässige Transportlast	1000 kg
Abmessungen	1200 x 600 x 240 mm
Bodenfreiheit	30 mm
Rampenfähigkeit	nein
Lastübergabesystem	Hubtisch
Sonderausstattung	Hubtisch, Hubsäule , Rollenbahn, Greifer oder Staufördersystem
IP Schutzgrad	54
GESCHWINDIGKEIT	
Fahrgeschwindigkeit	0 - 1,5 m/s
Maximal Geschwindigkeit	1,5 m/s
NAVIGATION	
Navigationsart	Freie Navigation
Genauigkeit	+/- 5 mm*
Zusatznavigation	Optional DMC Navigation
Genauigkeit mit Zusatznavigation	+/- 3 mm*
Hindernisumfahrung	Optional*
VDA 5050 kompatibel	Ja
SICHERHEIT	
Sicherheitsscanner	2D Sicherheitsscanner
Scannwinkel	360°
3D Kamera	Optional
Sichere Position	Optional
Safety WIFI	Optional
AKKUMULATOR	
Typ	Lithium
Leistung	2,4 kW
Ladestrom	1C
VISUALISIERUNG	
Fahrvisualisierungssystem	Ja
Akustikvisualisierungssystem	Ja
Panel	Optional

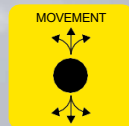
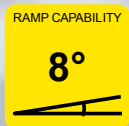
*In Abhängigkeit von Sensorik und Konturdaten

PRODUCT RANGE

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.



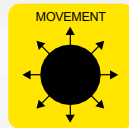
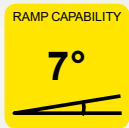
TECHNICAL DATA	TACT 1208
Movement method	Bidirectional
AGV weight	480 kg
Payload	1000 kg
Dimensions	1200 x 878 x 370 mm
Ground clearance	30 mm
Ramp capability	8°
Load transfer system	Platform
Special equipment	Lifting table, lifting column, roller conveyor, gripper, or accumulating conveyor system
IP 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 code 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.



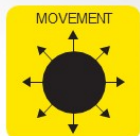
TECHNICAL DATA	TACT 1610
Movement method	Omnidirectional
AGV weight	730 kg
Payload	1000 kg
Dimensions	1600 x 1078 x 370 mm
Ground clearance	40 mm
Ramp capability	7°
Load transfer system	Platform
Special equipment	Lifting table, lifting column, roller conveyor, gripper, or accumulating conveyor system
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 code 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 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.



TECHNICAL DATA	TACT 2010 H200	TACT 2010 H480
Movement method	Omnidirectional	Omnidirectional
AGV weight	520 kg	550 kg
Payload	1500 kg	1500 kg
Dimensions	2000 x 1000 x 230 mm	2000 x 1000 x 480 mm
Ground clearance	30 mm	30 mm
Ramp capability	No	No
Load transfer system	Platform	Platform
Special equipment	Lifting table, lifting column, roller conveyor gripper or accumulating conveyor system	Lifting table, lifting column, roller conveyor gripper or accumulating conveyor system
IP rating	54	54
SPEED		
Driving speed	0 - 1.5 m/s	0 - 1.5 m/s
Maximum speed	1,5 m/s	1,5 m/s
NAVIGATION		
Navigation type	Free navigation	Free navigation
Accuracy	+/- 5 mm*	+/- 5 mm*
Supplementary navigation	Optional DMC navigation	Optional DMC navigation
Accuracy with additional navigation	+/- 3 mm*	+/- 3 mm*
Obstacle bypass	Optional*	Optional*
VDA 5050 compatible	Yes	Yes
SAFETY		
Safety scanner	2D safety scanner	2D safety scanner
Scanning angle	360°	360°
3D camera	Optional	Optional
Secure position	Optional	Optional
Safety WIFI	Optional	Optional
ACCUMULATOR		
Type	Lithium	Lithium
Power	2,5 kW	2,5 kW
Charging current	1C	1C
VISUALISATION		
Driving visualisation	Yes	Yes
Acoustic notifications	Yes	Yes
Panel	Optional	Optional

*Depending on sensor and contour data

**Deviation due to change of scanner position

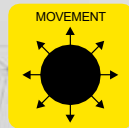
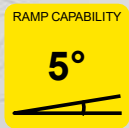


LINK: https://www.youtube.com/watch?v=1B_FSVjCeLc

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.



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 code 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 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 code 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

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.



BEWEGUNG

TRANSPORTLAST

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 m	2286 x 1400 x 455 m	3086 x 1400 x 455 m
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 telescopic chain gripper system	Rollers with telescopic chain gripper system	Rollers with telescopic 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 code 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			

PRODUCT RANGE





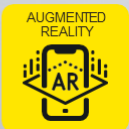
LINK: <https://www.youtube.com/watch?v=ao6nvaZbkFk>



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.



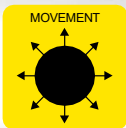
TECHNICAL DATA	TLIFT 2214
Movement method	Omnidirectional
AGV weight	1250 kg
Payload	2x 1000 kg
Dimensions	2286 x 1400 x 550 mm
Ground clearance	35 mm
Ramp capability	no
Load transfer system	Double Lifting Table
IP rating	54
SPEED	
Driving speed	0 - 1.6 m/s
Maximum speed	2.0 m/s
NAVIGATION	
Navigation 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

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.



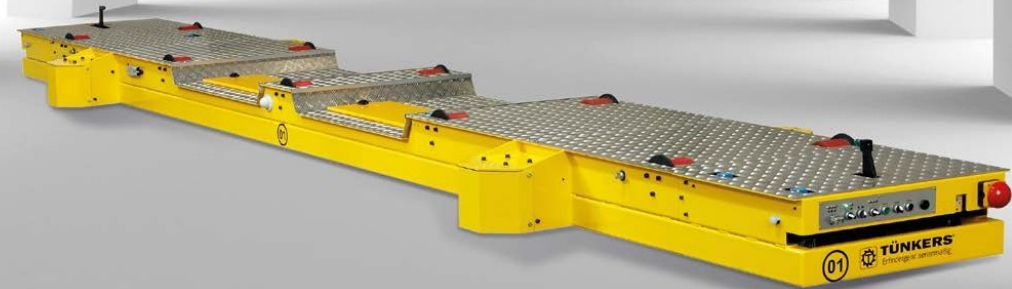
TECHNICAL DATA	TRex
Movement method	Omnidirectional
AGV weight	1400 kg
Payload	1000 kg
Dimensions	3400 x 1500 x 450 mm
Transfer height	350/450 mm
Ground clearance	30 mm
Ramp capability	No
Load transfer system	Belt conveyor
IP rating	20
SPEED	
Driving speed	0 - 1.0 m/s
Maximum speed	1.0 m/s
NAVIGATION	
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

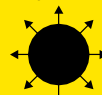
TÜNKERS SKID ROBOT

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


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	7500x1500x450mm	5400x1500x450mm	3062x1400x455mm
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 code 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



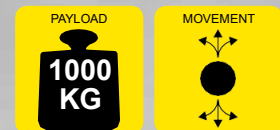


S

Tacker

TÜNKERS STACKER

The confident TÜNKERS S



TECHNICAL DATA	S
Movement method	Bidirectional
AGV weight	2600 kg
Payload	1000 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 code 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

PRODUCT RANGE



LINK: <https://www.youtube.com/watch?v=8oGxvqBVks8>

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 code 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 assembly lines.

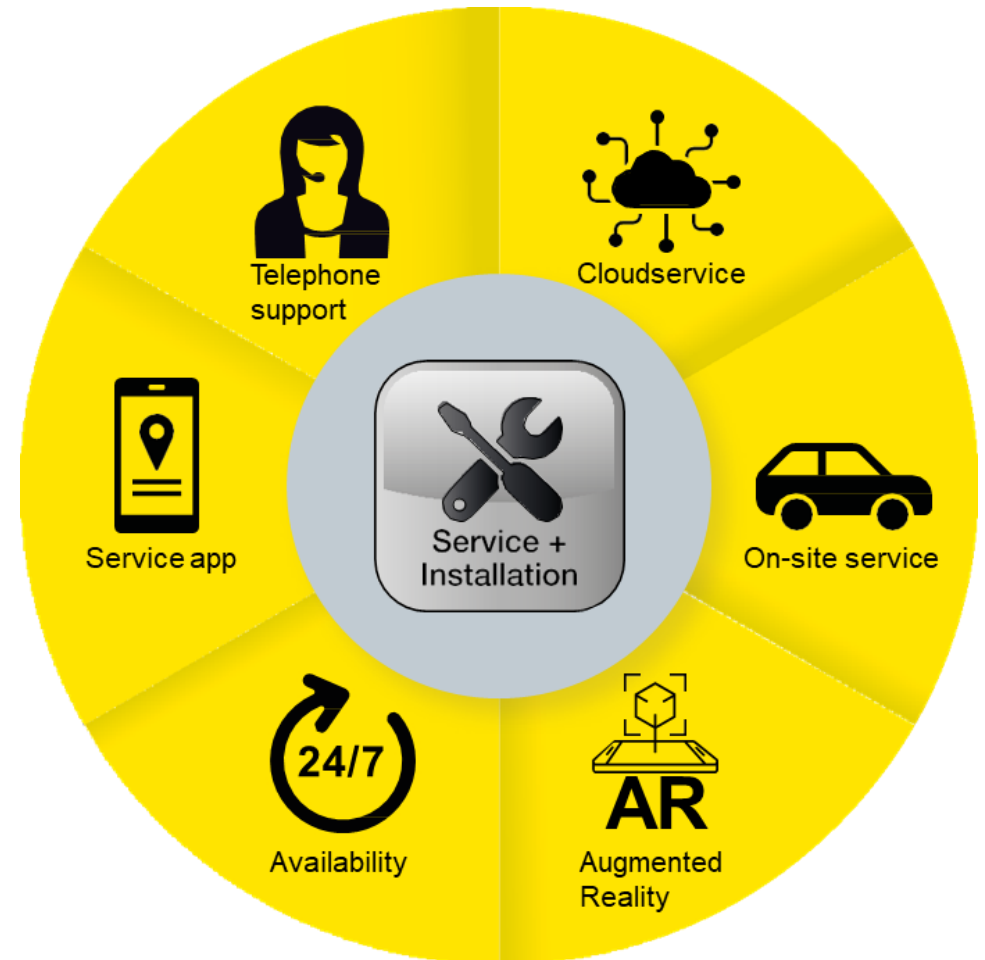


TECHNICAL DATA	CARSET
Movement method	Bidirectional
AGV weight	Variable depending on expansion
Payload	Variable depending on expansion
Dimensions	Variable depending on expansion
Ground clearance	30 mm
Ramp capability	No
Load transfer system	Manually
IP rating	54
Drive mode	Manually, automatically
Drive	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



Service

- Different service levels
- Customized service and maintenance packages
- Cloud service





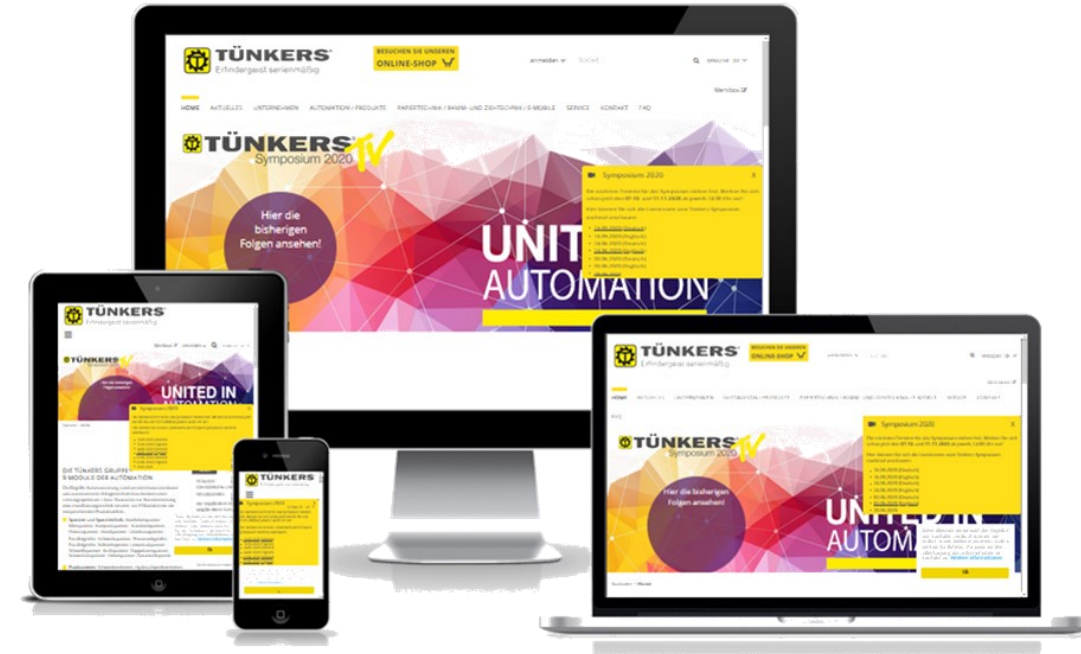
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... auf unserem Channel

<https://www.youtube.com/user/TuenkersMaschinenbau>

