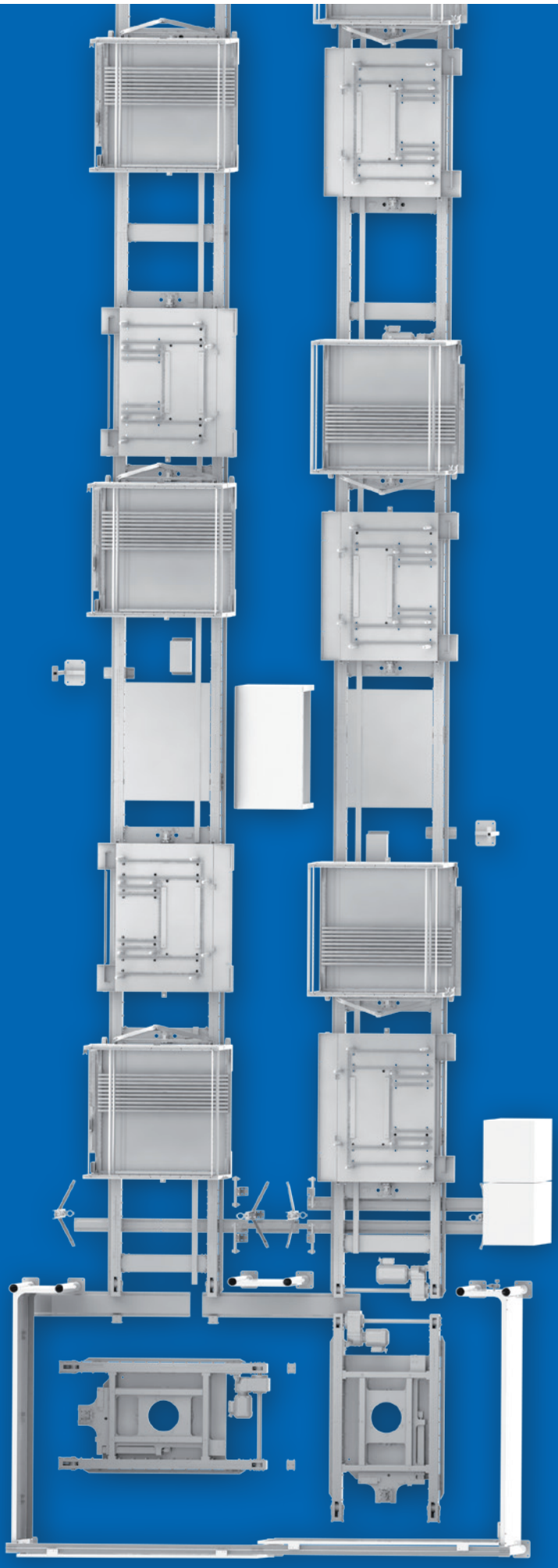
Transport system TS

KNOLL
.It works

Version 09-2015

Content



KNOLL Maschinenbau ranks among the leading suppliers of systems for conveying and filtering chips and coolant in the metal machining industry.

In order to be able to assemble its own products efficiently, KNOLL developed appropriate conveyor systems for in-house use. Meanwhile, other companies have come to rely on KNOLL conveyor and assembly systems. Thus, in addition to its own product line, components in mechanical engineering, the electrical and automotive industries are transported successfully. In addition, thanks to the possibilities of carriage transport, innovative logistics solutions can be realized in combination with tugger trains.

KNOLL transport technology is robust and long-lived. At the same time, the flexible toolbox system allows the expansion of existing solutions at any time according to current needs. Thanks to the use of cutting-edge production technologies and continuous enhancement, we have established ourselves in this sector.

KNOLL .It works

KNOLL with its approximately 950 employees is the largest employer in Upper Swabian Bad Saulgau. Walter Knoll laid the foundation for the company in 1970. The family business supplies manufacturers and users of machine tools with conveyors and filter systems around the world. All sectors employ KNOLL products in which machine tools are used for turning, cutting, drilling or grinding such as machine construction, electrotechnology, vehicle assembly, the aeronautics and aerospace industry and the energy sector. The company has grown continuously on its own premises since 1974. Its affiliation with and sense of responsibility toward the local region are part of its corporate philosophy. Whether planes, turbine blades, wheel rims, knives or cell phones, the list of end products that KNOLL contributes to is highly varied.

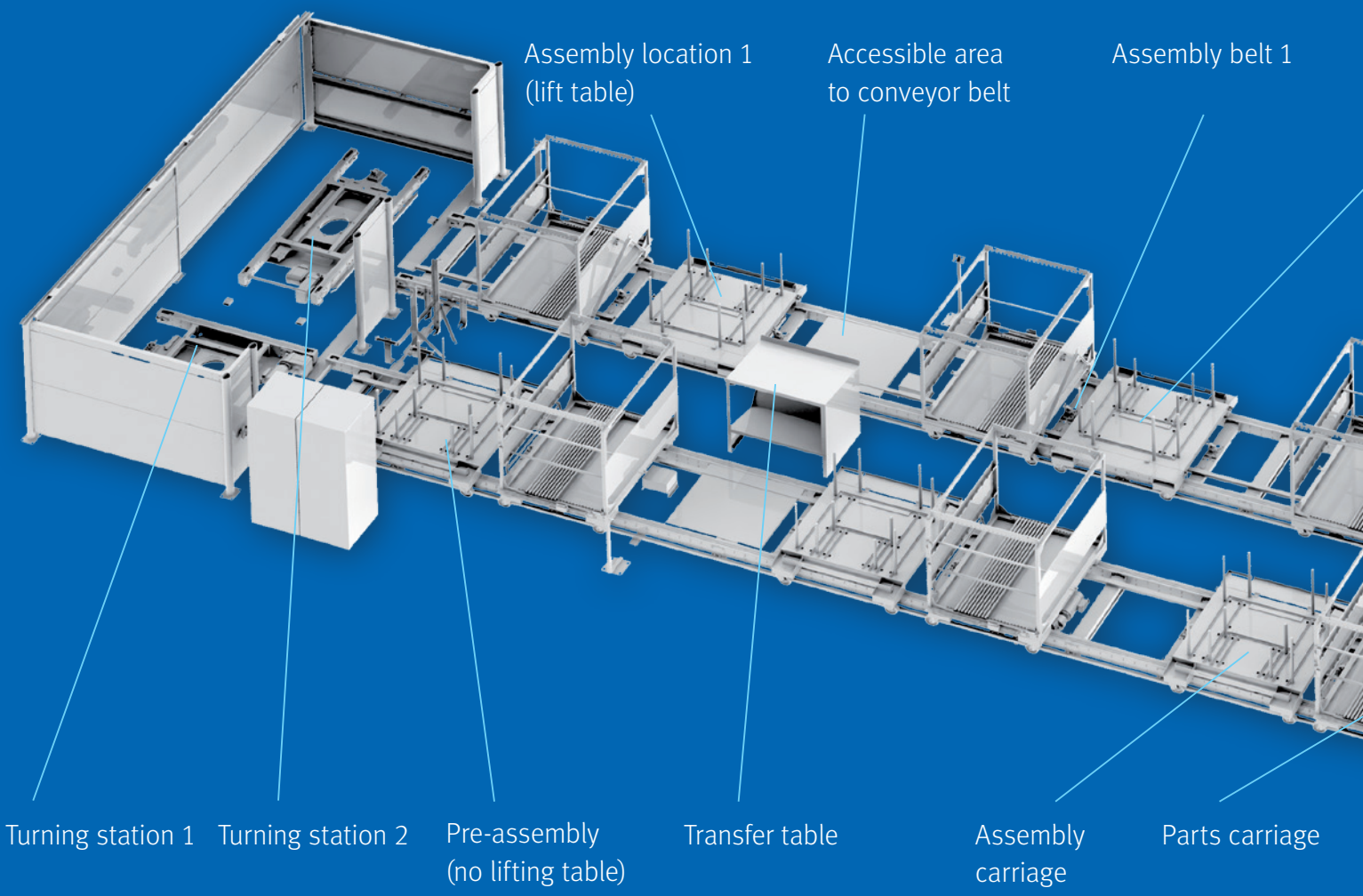
Properties

1 Load range
150 – 5000 kg/m.

2 Movable assembly and
picking carriage possible.

Function

Example of a conveyor belt for synchronized line assembly of a component



Applications area

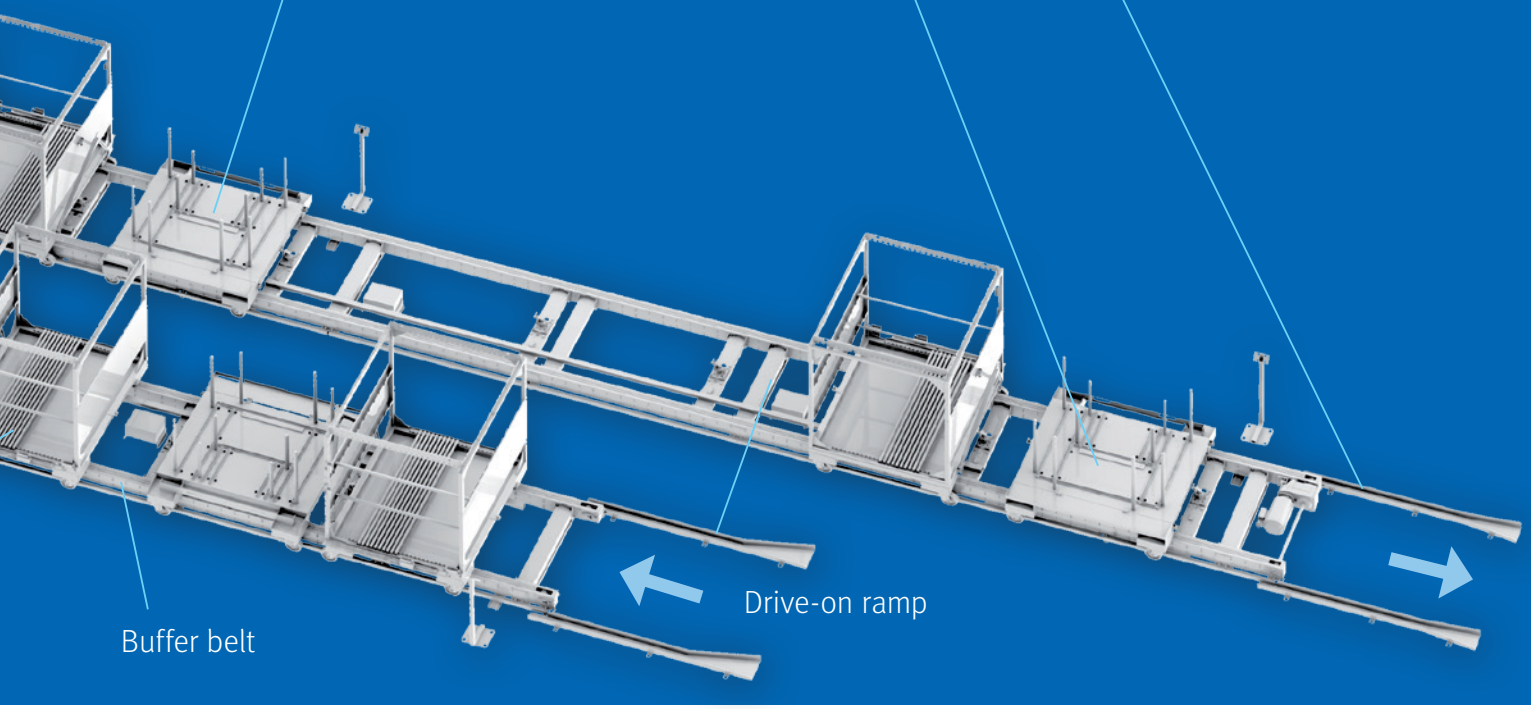
The TS transport system is ideal for transporting and assembling medium to heavy assemblies and workpieces such as transmissions, engines, housings, and white goods. Typical applications in assembly and processing are, for example:

- Synchronized line assembly
- Chaining of assembly workplaces
- Logistics in the material flow sector (transport to and from)
- Chaining of machine tools
- Transport of workpiece pallets

3 Great bending rigidity thanks to robust steel construction.

4 Flexible toolbox system, can be expanded at will.

5 Manual summoning and removal of the carriage completely without tools.



Each assembly and picking carriage represents an assembly unit, 3 assembly units are placed on a buffer belt.

tugger train-capable

Industries

- Mechanical and systems engineering
- Vehicle construction/automobile industry
- Aerospace industry
- Tool building
- Consumer goods industry
- Suppliers and contract manufacturers
- Electrotechnology
- Power engineering
- Furniture industry
- Construction machinery industry
- Agricultural industry

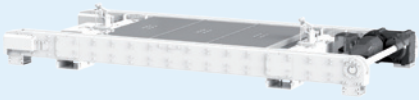
Functional characteristics

- Lifting
- Lowering
- Turning
- Positioning
- Buffering
- Flipping over
- Channeling in
- Channeling out

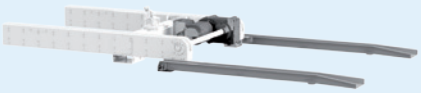
TS-S/TS-G
Transport system

Modular system

Straight belt element



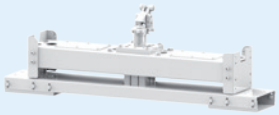
Straight belt element with cover



Drive-on and
drive-off ramp

Turning station 0° – 270°

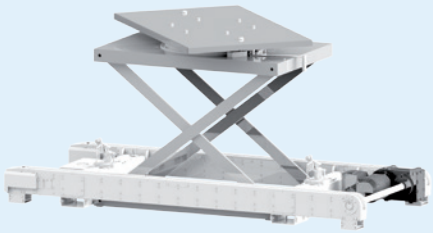
Indexing unit



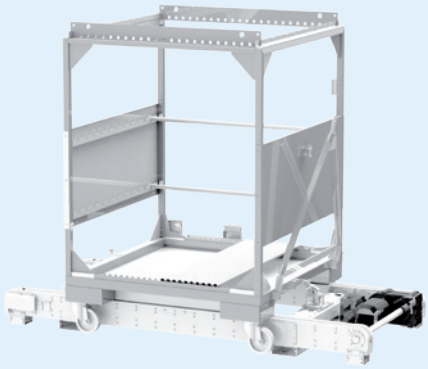
Stopper/traverse

Assembly carriage

Assembly carriage – driven



Scissor lift table

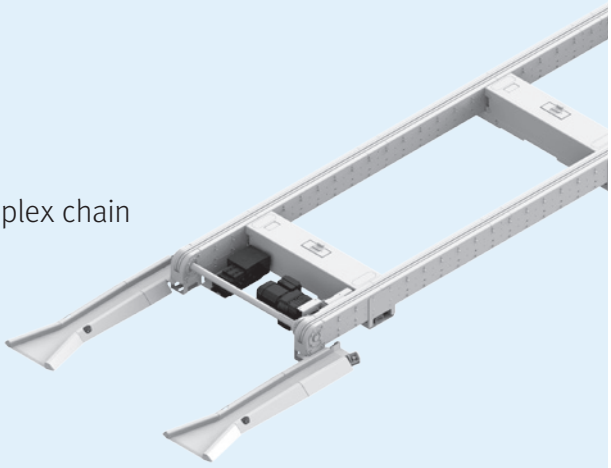


Picking carriage

Equipment options

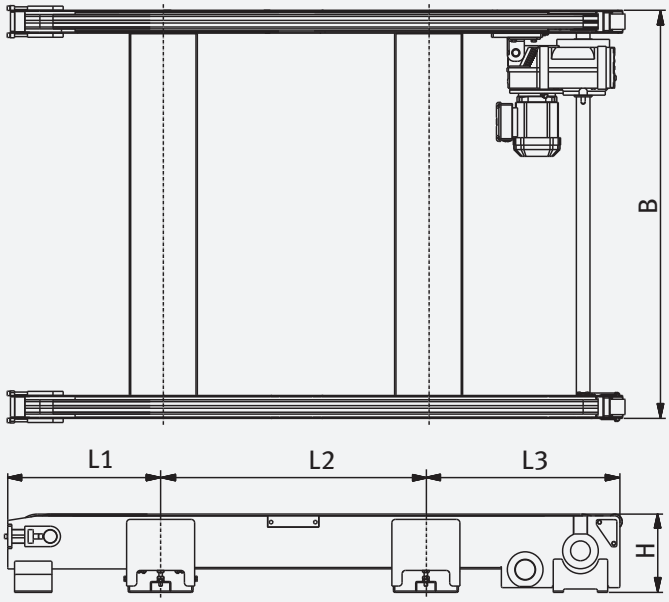
- Turning station 0° – 270°
- Converter 90°
- Electric carriage
- Safety housing
- Scissor lift table
- Indexing unit
- Adjustable pneumatic separator
- Automatic chain lubrication
- Height-adjustable base
- Walkable areas between the belts
- Identification system (RFID/bar code)
- Assembly carriage
- Picking carriage

Technical information



- Max. total length belt element: 12,000 mm
- Max. transport unit: 6,000 mm
- Transport weight: 1,500 kg/m
- Accumulation roller (maintenance-free on demand), 3/4“ duplex chain
- Depending on model, connected load of 0.37 to 1.1 kW
- Drive arranged between chain strands
- Conveyor speed: 9 m/min design variable
- FC-controlled on request
- Frame of powdered steel profile
- Pneumatic separator (damped/undamped)
- Electrical design modular and adapted to the mechanical toolbox
- Transport medium: transport carriage, workpiece carrier

Dimensions

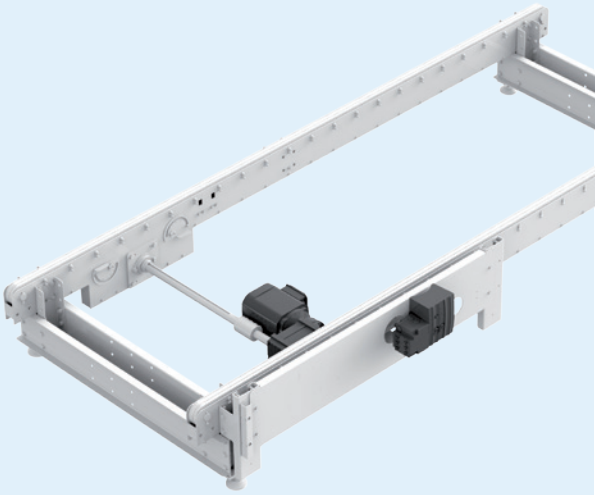


Component	B[1] (mm)	L1 (mm)	L2 (mm)	L3 (mm)	H[2] (mm)	v (m/min)
Deflection	560 – 2,000	455			min. 230 (± 10mm)	3 – 24
Belt segment	560 – 2,000		260–390–520–650–780–910–1,040–1,170–1,300–1,430–1,560–1,690–1,820–1,950		min. 230 (± 10mm)	3 – 24
Drive	560 – 2,000			528	min. 230 (± 10mm)	3 – 24

[1] Additional chain distances on request, [2] Elevation by customer request, B = chain distance, L =length of belt segment, H = belt height (minimum height), v = conveyor speed

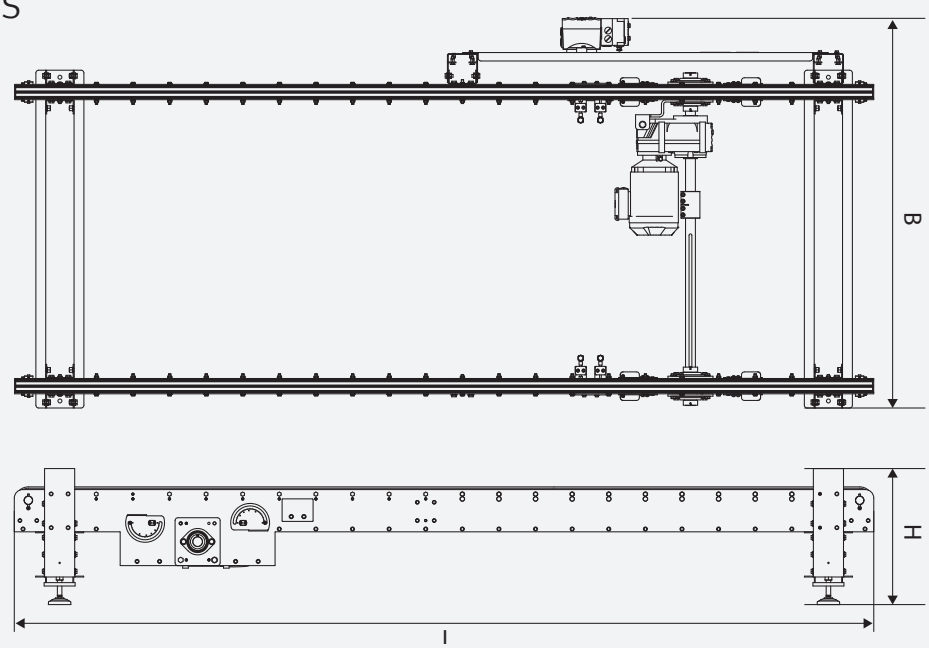
TS-G
Transport system

Technical information



- Max. overall length belt element: 6,000 mm
- Max. transport unit: 6,000 mm
- Transport weight: 5,000 kg/m
- Straight-lug chain (maintenance-free on request), 3/4“ duplex chain
- Depending on model, connected load of 0.37 to 1.5 kW
- Drive arranged between chain strands
- Conveyor speed: 9 m/min design variable
- FC-controlled on request
- Frame of powdered steel profile
- Belt overlapping possible (for parking/buffering of transport units)
- Electrical design modular and adapted to the mechanical toolbox
- Transport medium: transport carriage, workpiece carrier, Europallet, etc.

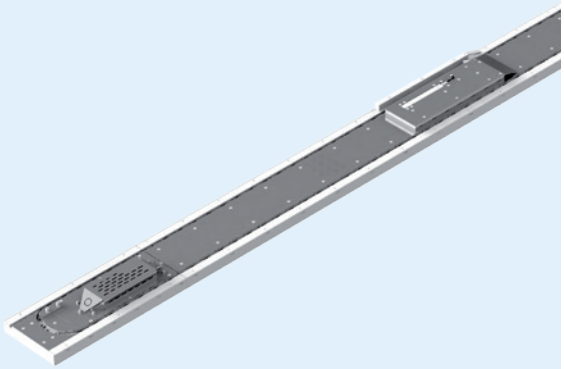
Dimensions



Component	B¹ (mm)	L (mm)	H² (mm)	v (m/min)
Belt body	500 – 2,000	1,500 – 6,000	min. 300	3 – 24

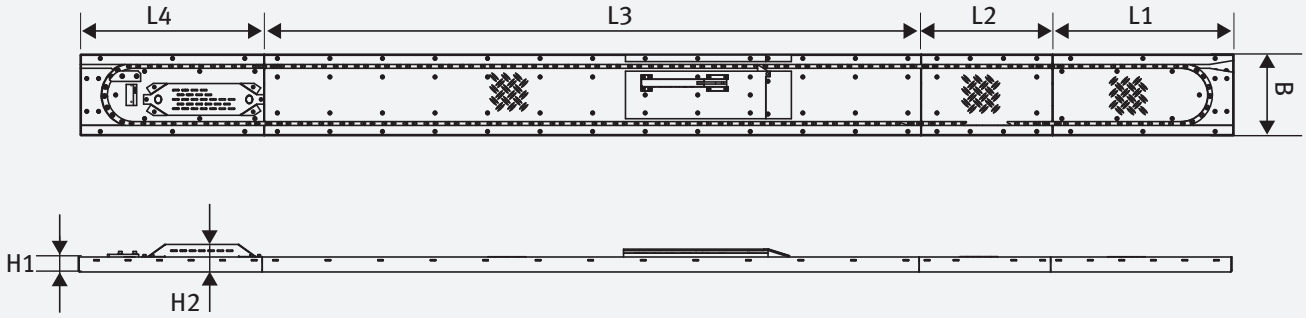
¹ Additional chain distances on request, ² Elevation by customer request, B = chain distance, L =length of belt segment, H = belt height (minimum height), v = conveyor speed

Technical information



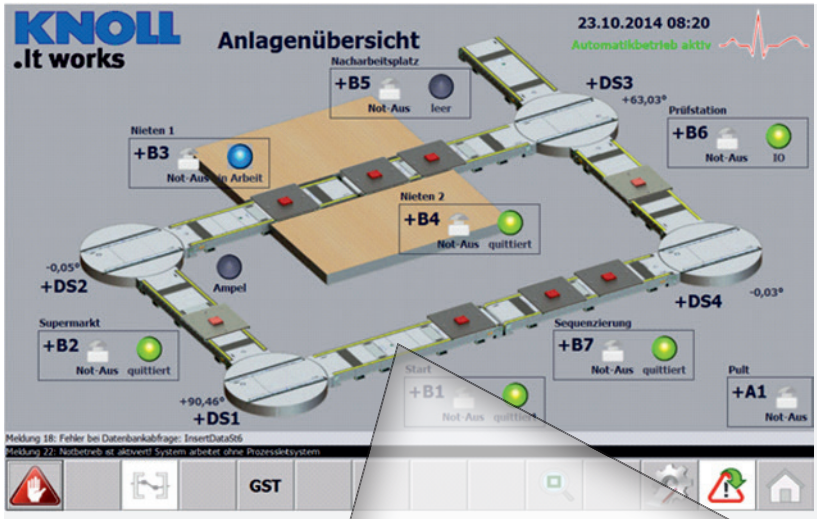
- Max. overall length belt: 50,000 mm (extension on request)
- Max. transport unit: 2,500 mm
- Max. transport weight: 3,500 kg per transport carriage
- Drive arranged between chain strands
- Speed adjustable steplessly
- Position controller possible
- Master-slave combination possible for two drive strands
- Underfloor or overfloor
- Chain sprocket can be adjusted variably
- Sprocket unit for transport carriage pre-sprung
- Uncoupling of cord via separator
- Transport medium: transport carriage

Dimensions



Component	B (mm)	L1 (mm)	L2 (mm)	L3 (mm)	L4 (mm)		H1 (mm)	H2 (mm)	v (m/min)
Deflection	min. 310	690					min. 57		max. 6
Chain tensioner	min. 310		500				min. 57		max. 6
Belt segment Default	min. 310			2,500			min. 57		max. 6
Drive	min. 310				700		min. 57	min. 105	max. 6
Belt segment variable	min. 310					variable	min. 57		max. 6

Control and process control system



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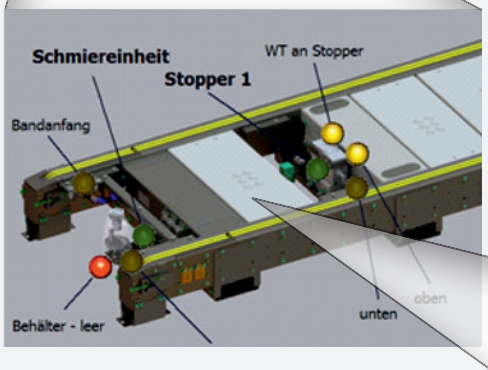
1st level: Start screen



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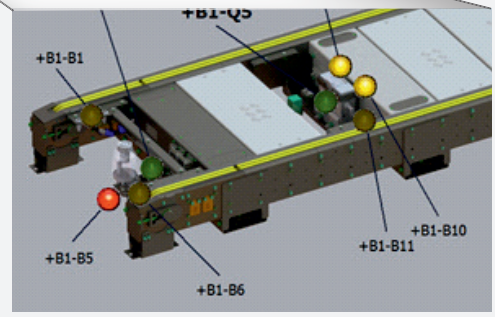
2nd level: Transport belt submenu
incl. status indicator

Open loop control

Controls required for the application are displayed on the screen. All required information is displayed graphically in order to assist the system operator and service personnel as much as possible. After the system is switched on, the start screen is displayed on the controller. The start screen provides an overview and control of the system as well as access to submenus. Function units, manual operation, switch-on conditions, user management, etc. are stored in the submenu and can be opened by touching the display. There is intuitive control of all functions and content via the user interface.



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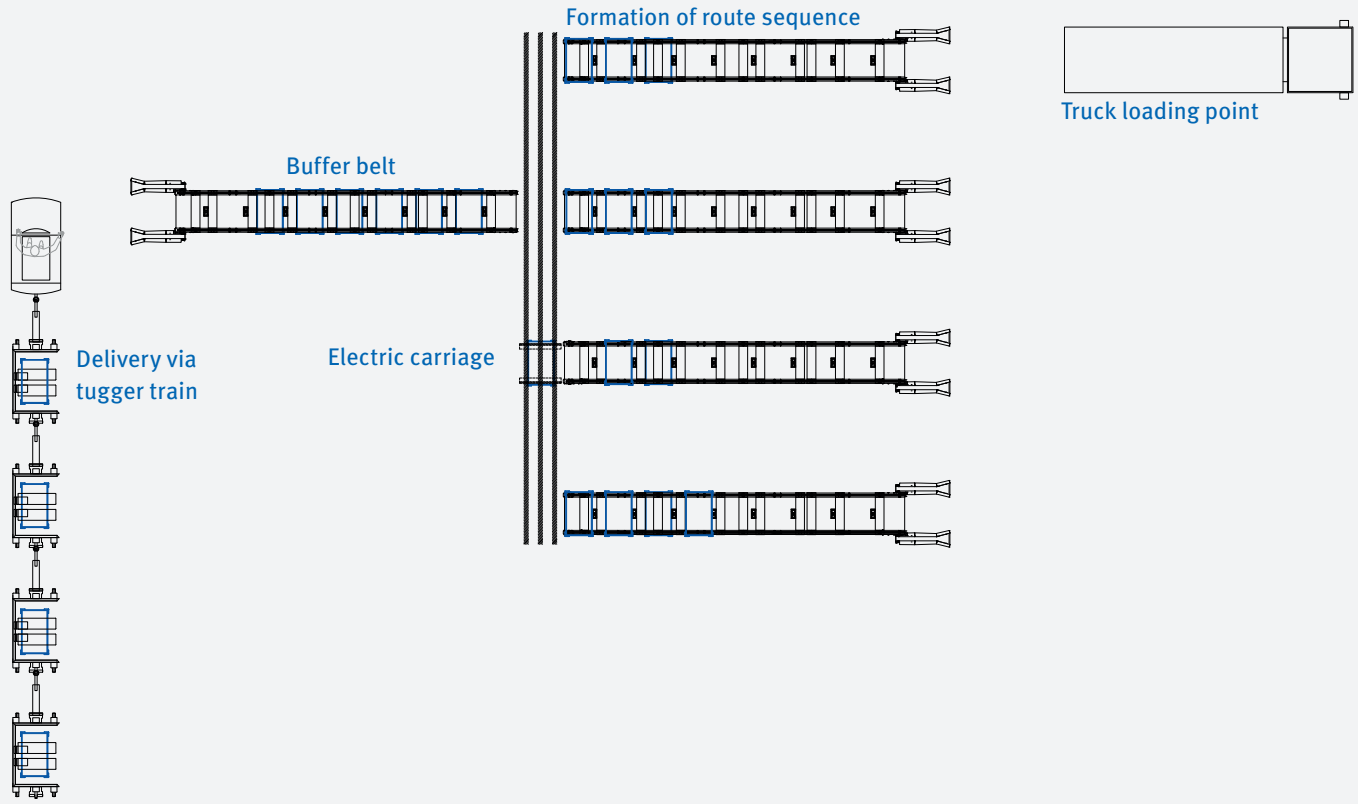
3rd Level
BMK display submenu

Process control system

The incorporation of a machine network into a company network is done via a process controller, which includes the appropriate interfaces for common controls. The process controller allows complex visualizations, is in a position to record and evaluate large quantities of data, has user management, as well as an integrated fault message handling including statistical evaluation. The necessary data for the ERP system used can be prepared and exchanged via a database interface. The application can be used for plant data collection (PDC), machine data collection (MDC), order management, and as an employee information system.

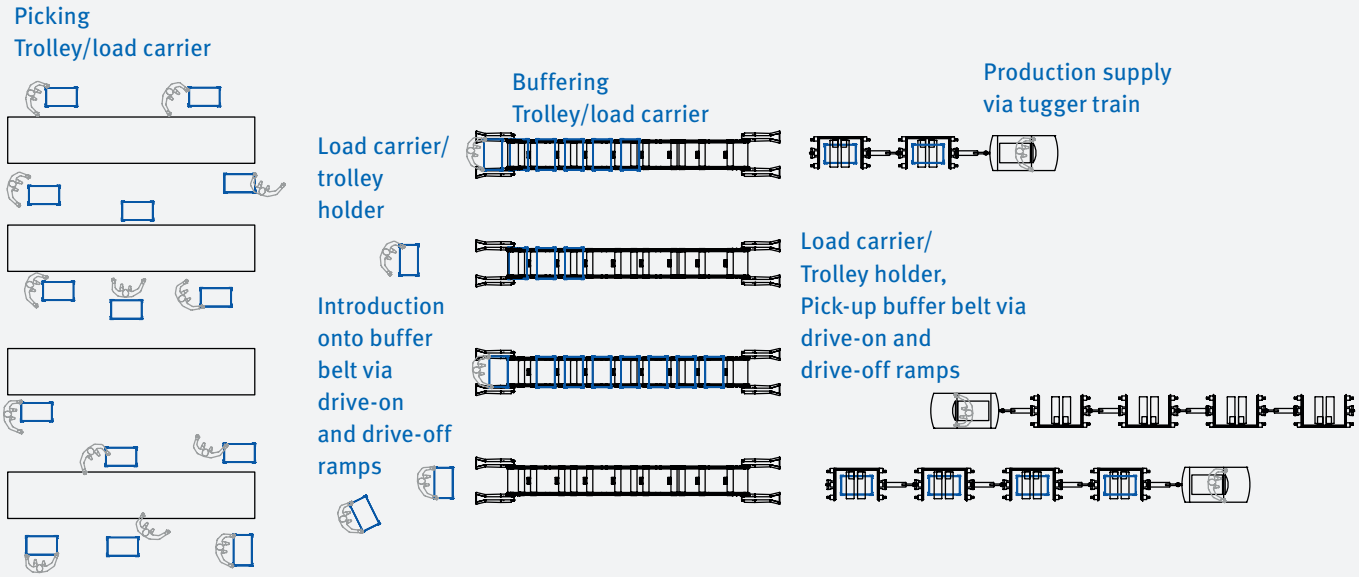
TS-S

Formation of route sequence



TS-S

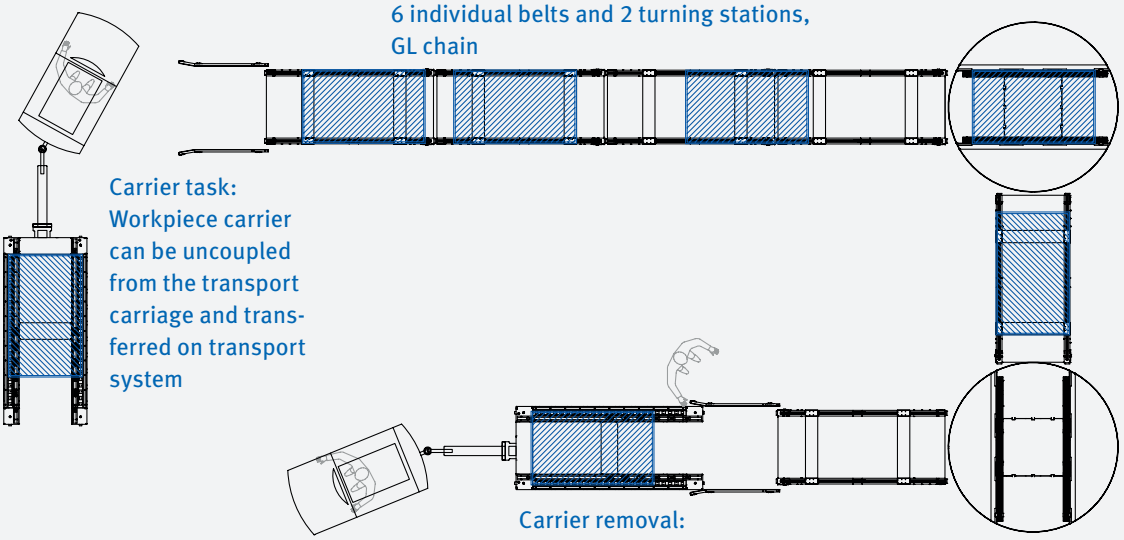
Picking zone



Application examples

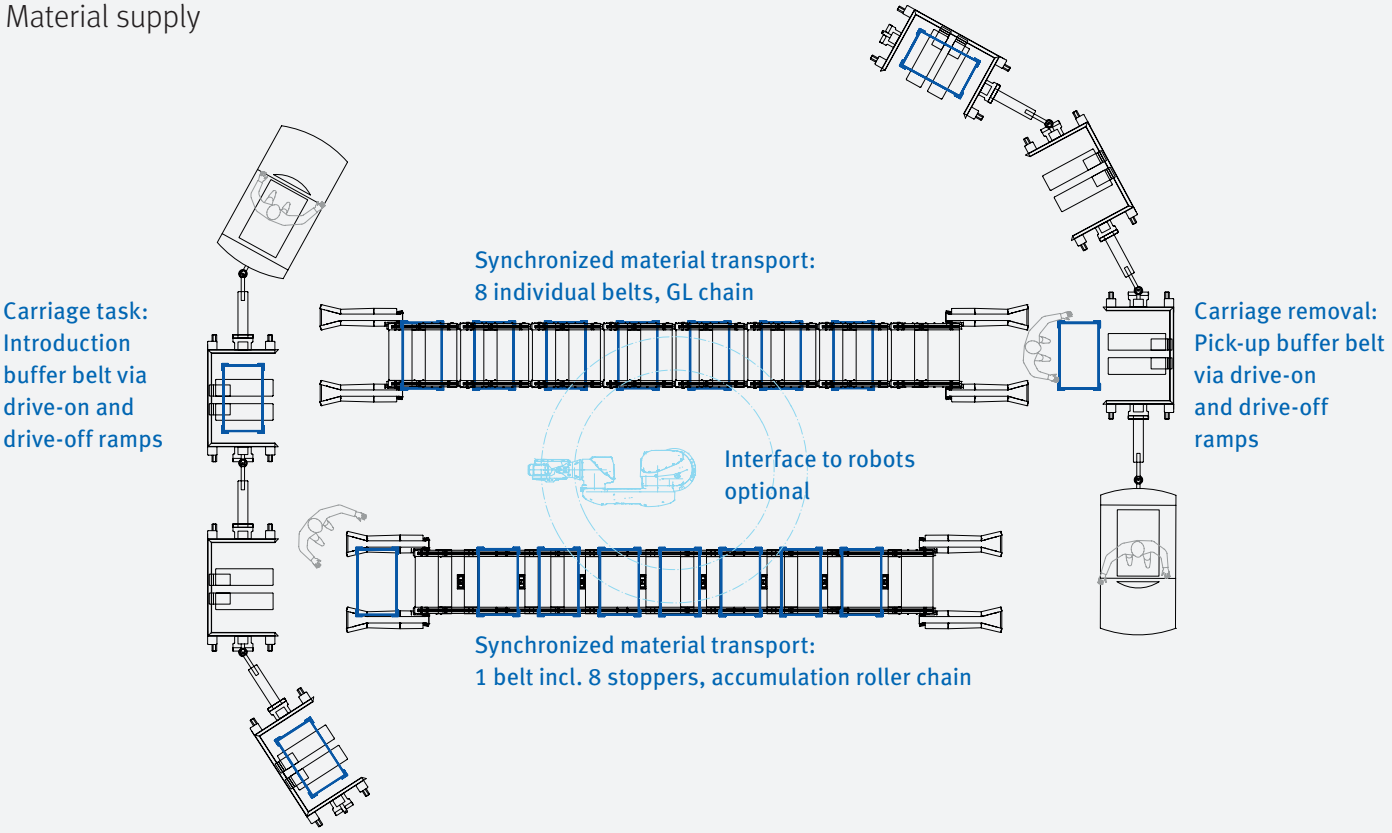
TS-S/TS-G

Assembly platform can be uncoupled



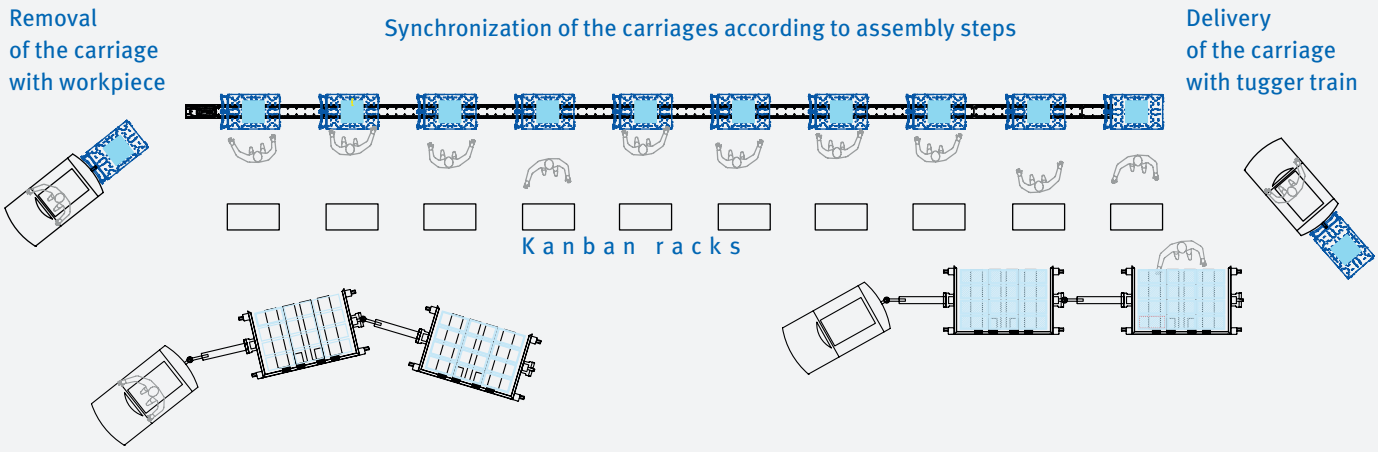
TS-S

Material supply



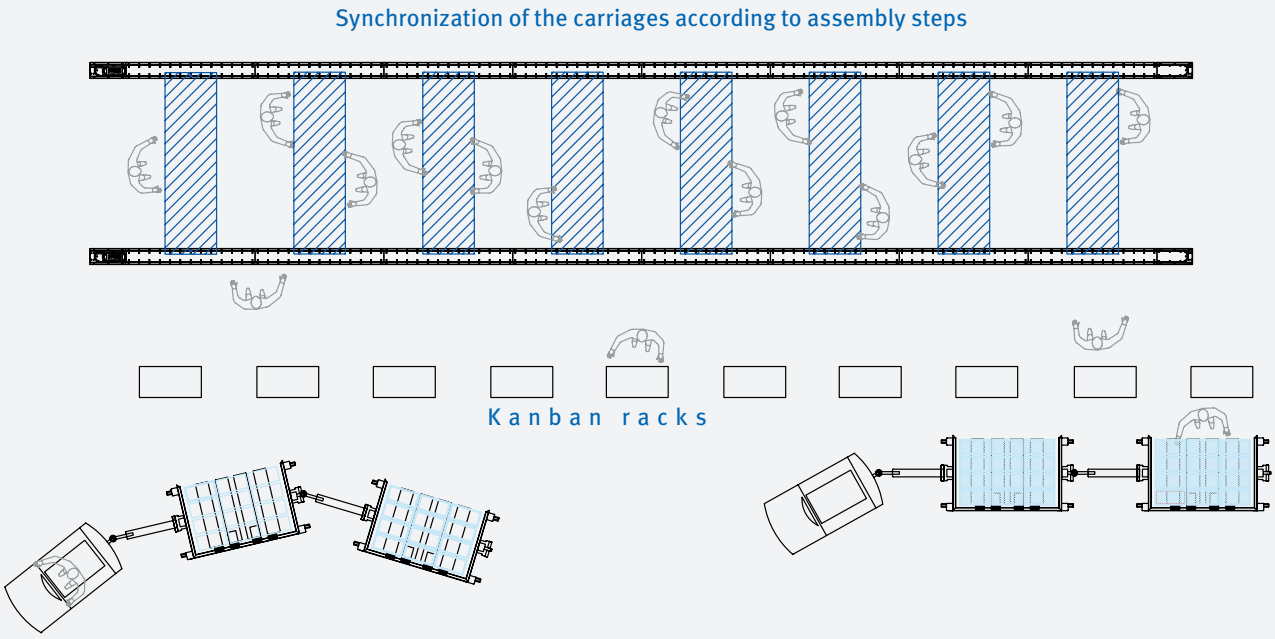
TS-Z

Single-strand assembly line



TS-Z

Two-strand assembly line



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