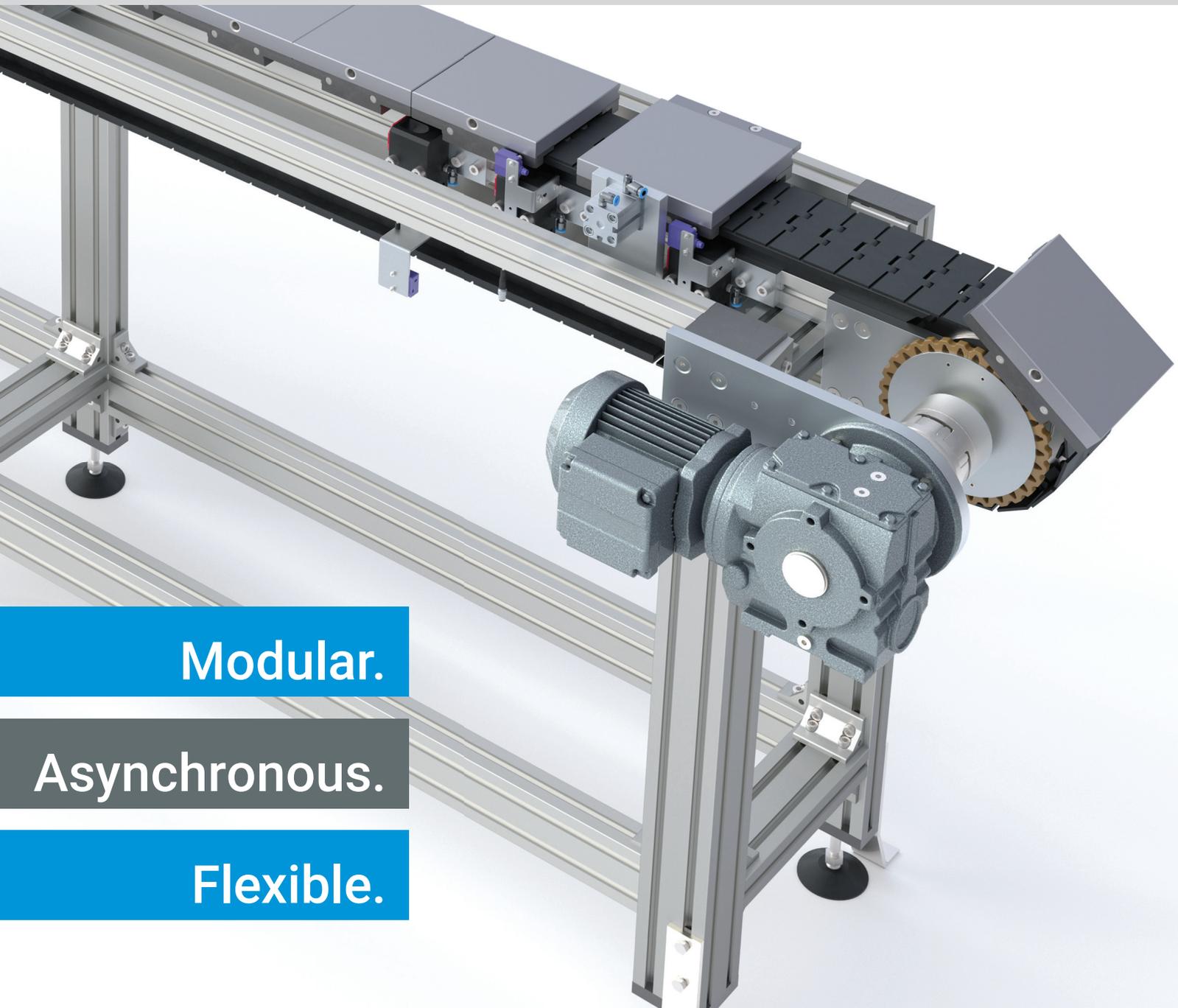




# SPU 2040

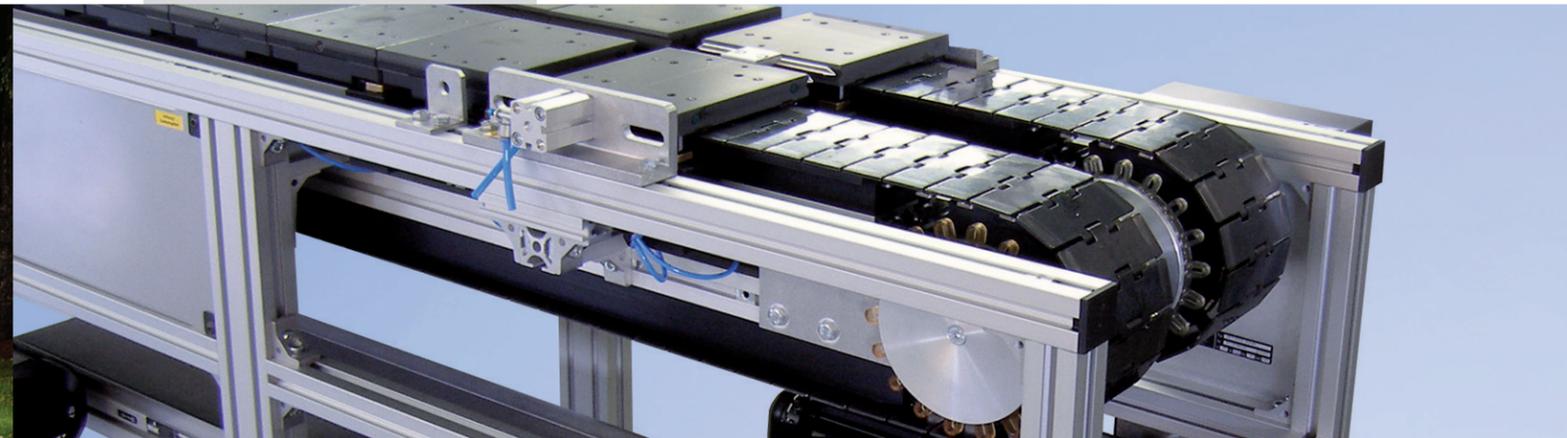
Accumulating and Recirculating Pallet Conveyors



**Modular.**

**Asynchronous.**

**Flexible.**



## *Introduction to mk*

mk North America is a member of the mk Technology Group and a leading worldwide manufacturer of pallet-handling systems, aluminum conveyors, stainless steel conveyors, and extruded aluminum framing.

Unsurpassed variety, maximum flexibility, superb quality and easy integration are reasons mk has become the supplier of choice for machine builders, system integrators and manufacturing companies around the globe.

Since 1988 mk North America has been providing diverse industrial know-how, superb quality, constant innovation and application engineering excellence. mk North America offers you a perfect solution for any application.

## *better products. better solutions.*

At mk North America we believe in offering not only better products, but also better solutions. We offer the most extensive product line in the industry; featuring more than 30 different types of conveyors. This allows us to partner with you to provide just the right solution for your needs.

Our broad offering and years of experience in material handling allows us to provide the best equipment for your individual needs. Our innovative conveying, both standard and custom, has proven itself in the automotive, manufacturing, machine builder, electronics, consumer goods, and printing industries, to name a few.

When ordering our conveyors you will experience firsthand the benefits of our innovative designs, competitive pricing and exceptional customer service.

At mk we are dedicated to providing you better products and better solutions.

### **The mk Advantage**

- ✓ Robust construction and high quality components decrease downtime and increase productivity
- ✓ Modular design to reduce engineering costs and lead-times
- ✓ Technical application assistance on every project
- ✓ Competitive pricing
- ✓ Innovative design
- ✓ Custom solutions



## Introduction to SPU 2040

The SPU-2040 is an accumulating pallet recirculating conveyor system which offers feeding, buffering, positioning and separating of workpieces in the smallest possible space. The robustness and the variety of the various models available allows it to be used in practically all areas of automation and material flow.

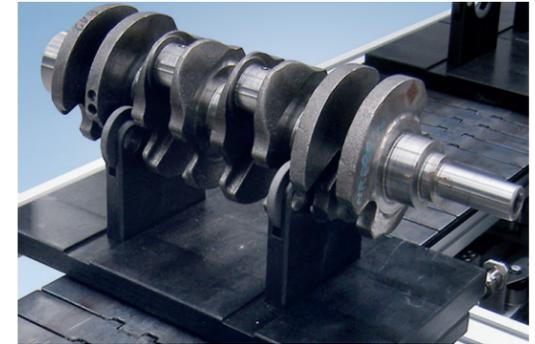
### Automatic recirculation of pallets

Using a flat top chain conveyor, the workpieces carried on the pallets are loaded on the conveyor as normal. After removal of the workpiece, the empty pallet is safely conveyed back on the underside of the conveyor and up to the main conveying surface again. The pallets are now available at the starting point of the conveyor where they can be loaded with new workpieces.

The SPU 2040 is an alternative to traditional over-under pallet-handling conveyor systems. It omits the need for a second conveying level and the vertical transfer units for moving the pallet between the levels. The SPU 2040 has fewer motors, drives, mechanical components, pneumatics, and controls when compared to a traditional over-under conveyor system.

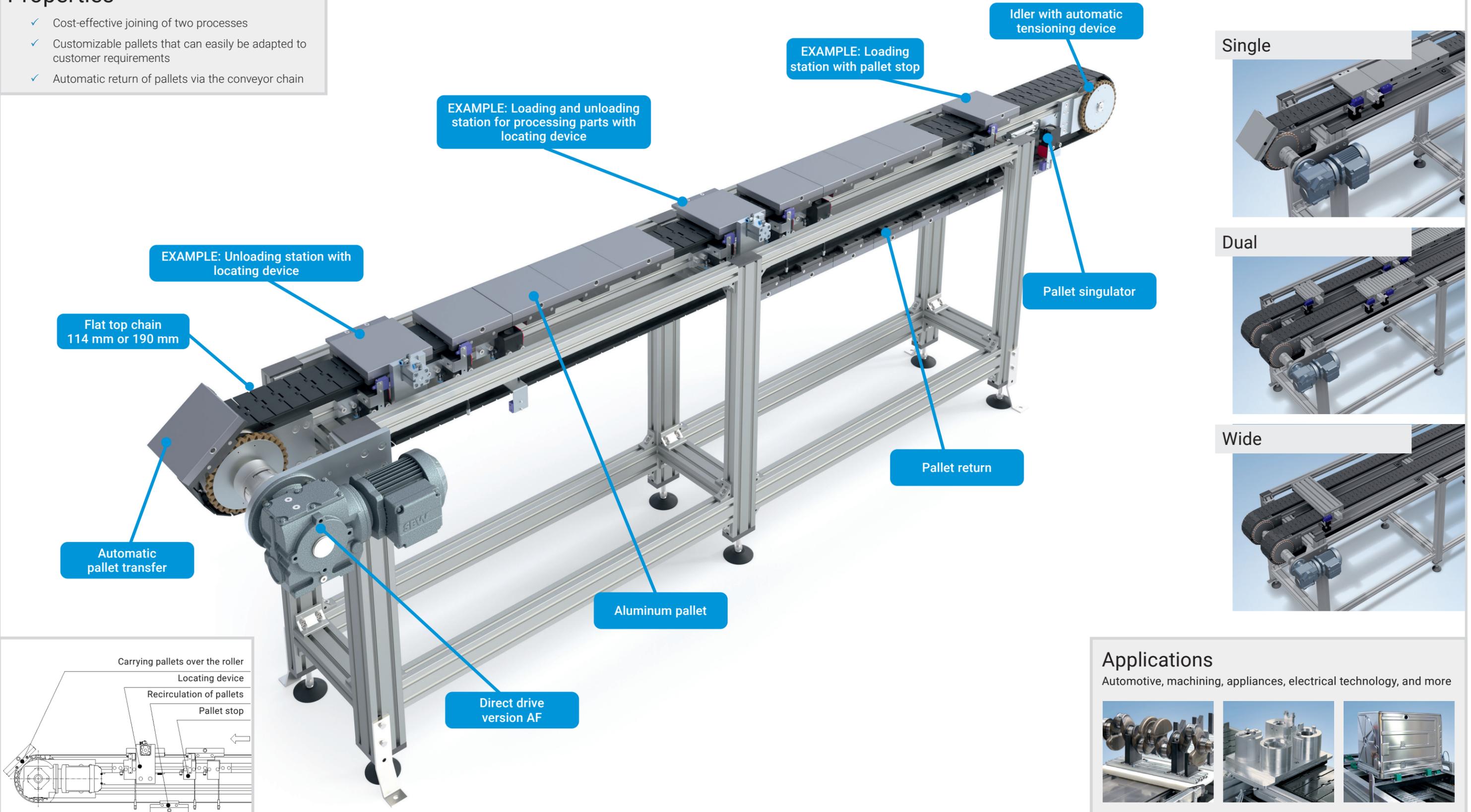
## Uses and Benefits of SPU 2040

- ✓ Cost-effective and compact joining of two processes or machining stations
- ✓ Reliable and dynamic feeding, buffering, positioning and separating of pallets and product
- ✓ Compact design with space saving recirculation of pallets on the conveyor chain return
- ✓ Allows for buffering and accumulation of product between machines with differing cycle times
- ✓ Conveyor lengths from 2 to 10 meters
- ✓ Conveyor speeds from 15 to 50 fpm
- ✓ Low maintenance



## Properties

- ✓ Cost-effective joining of two processes
- ✓ Customizable pallets that can easily be adapted to customer requirements
- ✓ Automatic return of pallets via the conveyor chain



Single

Dual

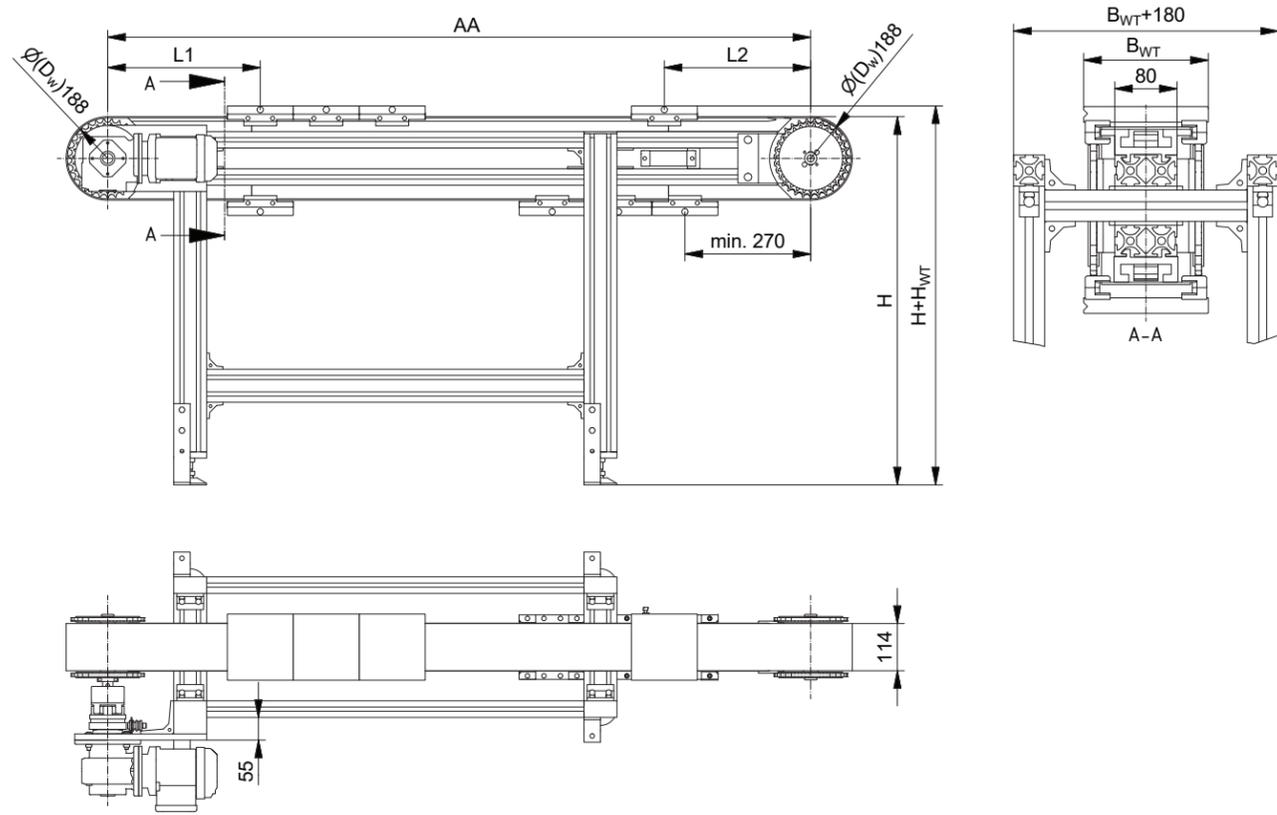
Wide

## Applications

Automotive, machining, appliances, electrical technology, and more



Single – 114 chain width option

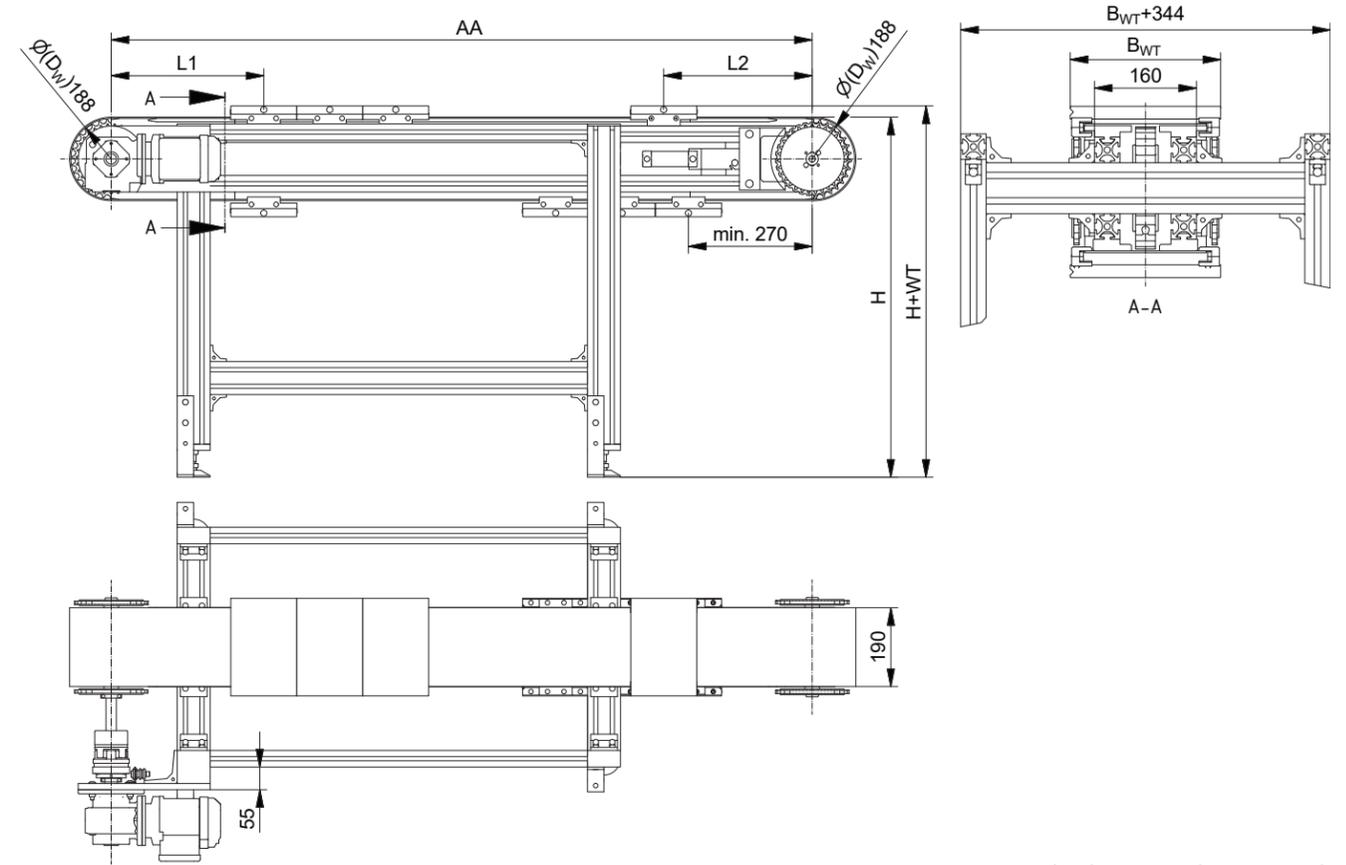


Example drawing shows AF drive

Technical data

Centerline distance AA	1,700 - 10,000 mm
Pallet width B <sub>WT</sub>	160 mm
Chain width	114 mm
Length L1 min.	AC (bottom mount) drive: 300 mm   AF (direct) drive: 365 mm
Length L2 min.	495 mm
Conveyor height H min.	AC (bottom mount) drive: 800 mm depending on motor size and orientation AF (direct) drive: 465 mm
Speed	15 up to 50 fpm
Total load max.	660 lbs., depending on the speed

Single – 190 chain width option

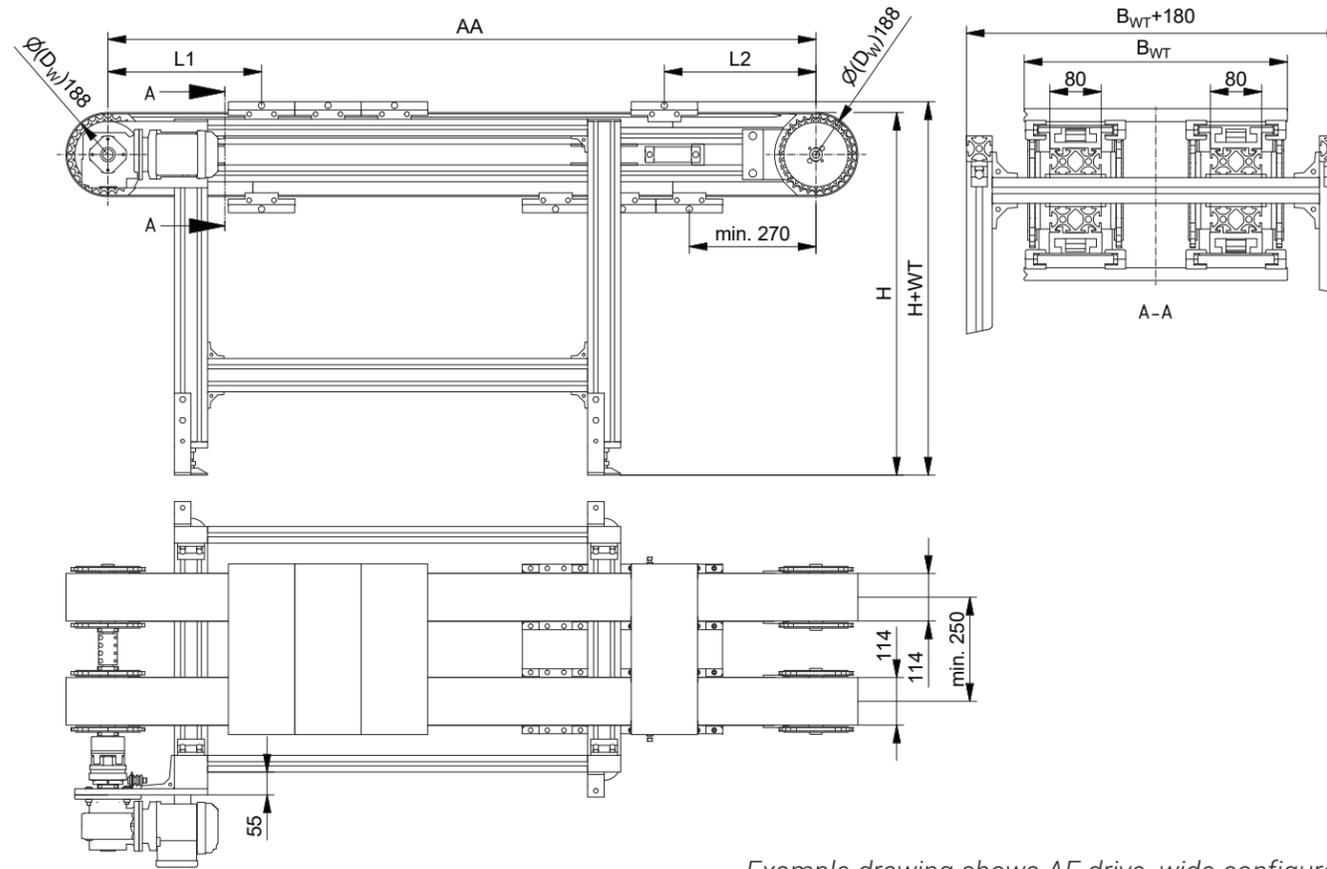


Example drawing shows AF drive

Technical data

Centerline distance AA	1,700 - 10,000 mm
Pallet width B <sub>WT</sub>	min. 236 mm, others on request
Chain width	190 mm
Length L1 min.	AC (bottom mount) drive: 300 mm   AF (direct) drive: 365 mm
Length L2 min.	495 mm
Conveyor height H min.	AC (bottom mount) drive: 800 mm depending on motor size and orientation AF (direct) drive: 465 mm
Speed	15 up to 50 fpm
Total load max.	660 lbs., depending on the speed

## Dual and Wide Configurations



Example drawing shows AF drive, wide configuration

### Technical data

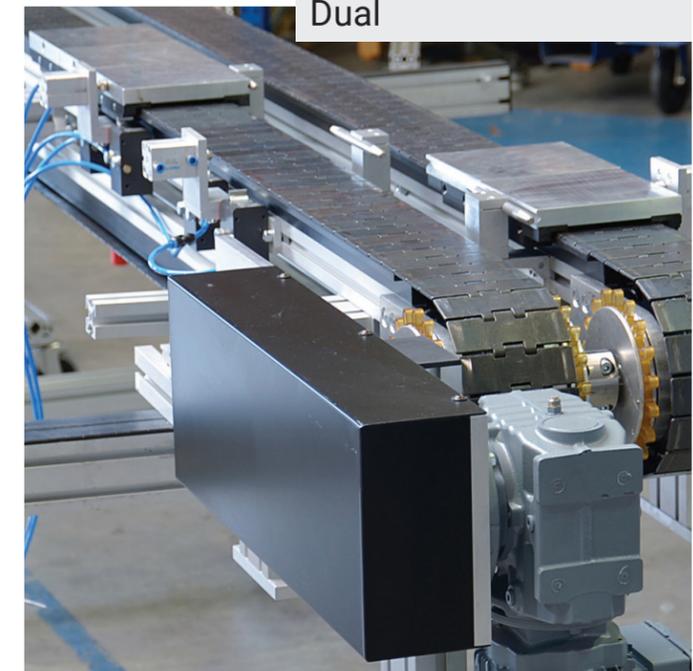
Centerline distance AA	1,700 - 10,000 mm
Pallet width $B_{WT}$	Dual: 160 mm per lane   Wide: 410 mm min.
Chain width	114 mm
Length L1 min.	AC (bottom mount) drive: 300 mm   AF (direct) drive: 365 mm
Length L2 min.	495 mm
Conveyor height H min.	AC (bottom mount) drive: 800 mm depending on motor size and orientation AF (direct) drive: 465 mm
Speed	15 up to 50 fpm
Total load max.	Dual (asynchronous): 1,330 lbs., depending on speed Wide (synchronous): 990 lbs., depending on speed



Single

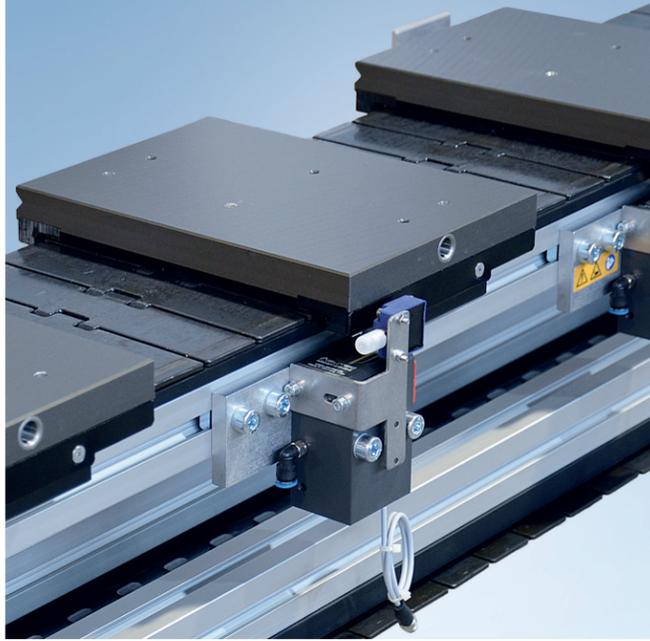


Wide



Dual

## Conveyor Components



### Pallet

Several versions of the pallet are available for different requirements. In wide pallet systems, the pallet width depends on the conveyor width. The fixture design must be known in advance, in order to determine the center of gravity. Loading must be centered on the pallet.

#### Technical data

- Pallets are made from aluminum plate material or mk series 40 aluminum extrusion
- Lateral positioning groove and locating bushing ensure high positioning precision
- POM wear strip
- Permitted (Perm.) maximum (max.) tare weight = the total weight of the pallet and fixture

#### Single and Dual Conveyor Pallets

Fixture height	Perm. max. tare weight
up to 75 mm	26 lbs.
up to 100 mm	22 lbs.
up to 125 mm	18 lbs.
> 125 mm	13 lbs.

#### Wide Conveyor Pallets

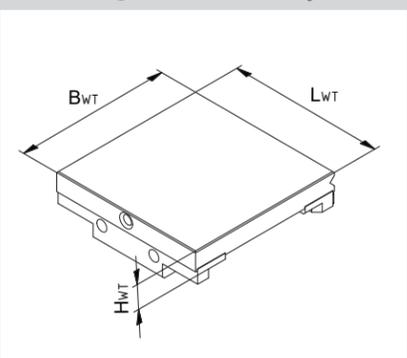
Fixture height	Perm. max. tare weight
up to 75 mm	44 lbs.
up to 100 mm	35 lbs.
up to 125 mm	26 lbs.
> 125 mm	22 lbs.

#### Pallet (WT) Aluminum Plate



Hard coated aluminum plate

#### For Single and Dual Systems



Chain width	Width B <sub>WT</sub>	Length L <sub>WT</sub>	Height H <sub>WT</sub>
114 mm	160 mm	160 mm	26 mm
190 mm	236 mm	160 mm	26 mm

Larger pallet widths and additional pallet lengths are available upon request

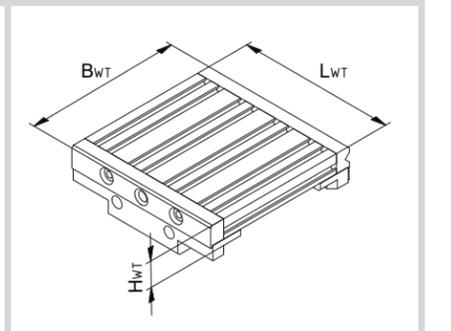
#### Pallet (WT) 25/40



Series 25/40 aluminum support plate

T-slots are M6 hardware compatible

#### For Single and Dual Systems



Chain width	Width B <sub>WT</sub>	Length L <sub>WT</sub>	Height H <sub>WT</sub>
114 mm	160 mm	160 mm	28 mm
190 mm	236 mm	160 mm	28 mm

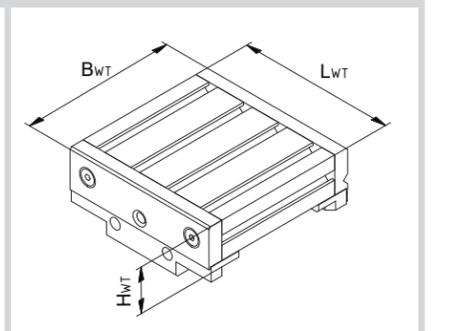
#### Pallet (WT) 40



Series 40 aluminum support plate

T-slots are M6 or M8 hardware compatible

#### For Single and Dual Systems



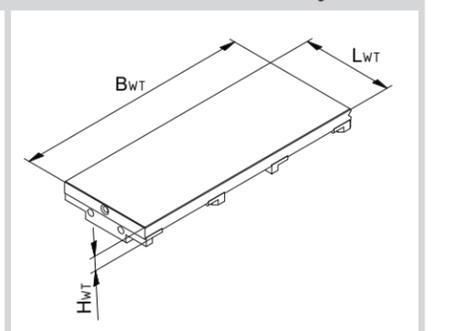
Chain width	Width B <sub>WT</sub>	Length L <sub>WT</sub>	Height H <sub>WT</sub>
114 mm	160 mm	160 mm	48 mm
190 mm	236 mm	160 mm	48 mm

#### Pallet (WT) Aluminum Plate "Heavy Load"



Hard coated aluminum plate

#### For Wide Systems



Chain width	Width B <sub>WT</sub>	Length L <sub>WT</sub>	Height H <sub>WT</sub>
114 mm	min. 410 mm	160 mm	26 mm

Larger pallet widths and additional pallet lengths are available upon request

## Conveyor Frame Options

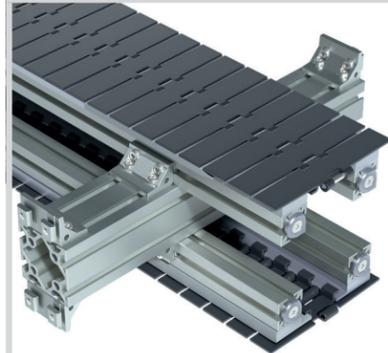
### Chain width 114 mm



#### Properties

- Flat top chain made of wear-resistant carbon steel
- 4.5-inch wide chain
- 1.5-inch pitch

### Chain width 190 mm



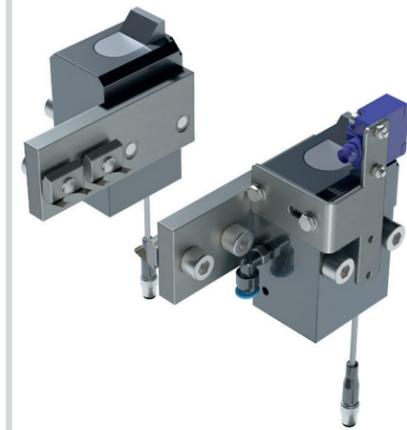
#### Properties

- Flat top chain made of wear-resistant carbon steel
- Not valid for dual and wide configurations
- 7.5-inch wide chain
- 1.5-inch pitch

## Pallet Stops

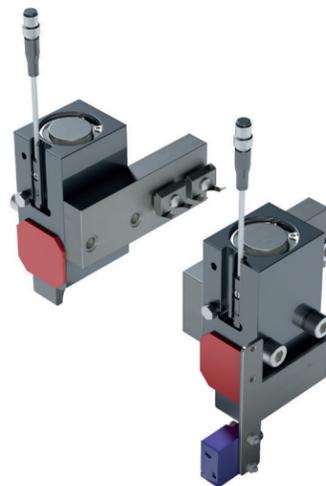
### SU 400 Top

- Stroke 9 mm



### SU 400 Bottom

- Stroke 15 mm



#### Properties

- Provided in a set (2), one per side of the conveyor
- Undamped stopping
- Permitted total load at 6 bar
  - up to v = 20 fpm: 220 lbs.
  - up to v = 30 fpm: 165 lbs.
  - up to v = 40 fpm: 130 lbs.
  - up to v = 50 fpm: 110 lbs.
- Pallet sensor included
- Does not include positioning or locating features

## Pallet Singulator

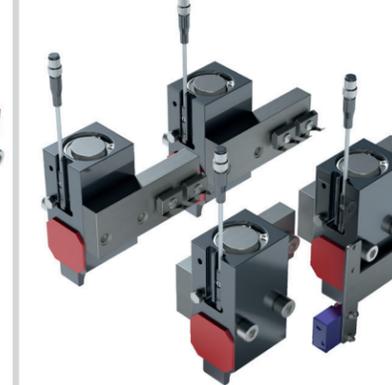
### Separator top

- Stroke 9 mm



### Separator bottom

- Stroke 15 mm



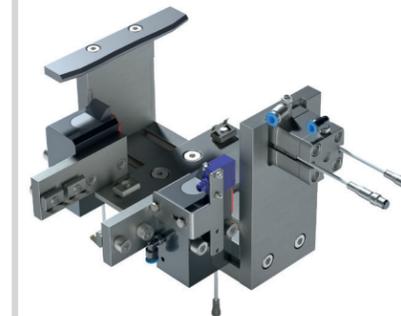
#### Properties

- Provided in sets of two - four (4) total, two (2) per side of the conveyor
- Undamped stopping/singulating
- Permitted total load at 6 bar
  - up to v = 20 fpm: 220 lbs.
  - up to v = 30 fpm: 165 lbs.
  - up to v = 40 fpm: 130 lbs.
  - up to v = 50 fpm: 110 lbs.
- Pallet sensor included
- Does not include positioning or locating features

## Locating Device

#### Properties

- Stroke stopper 9 mm



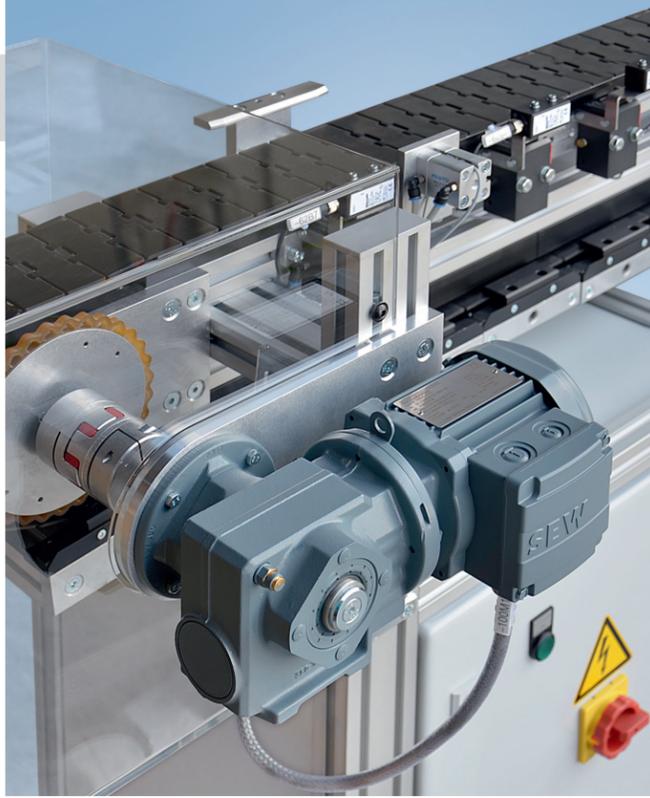
- Positioning accuracy of  $\pm 0.2$  mm
- Lifts pallet, 1 mm off the chain, via pneumatic cylinder with a locating feature
- Undamped stopping/separating
- Pallet sensor included
- Pneumatic sensor is optional
- Lifting force (pallet + fixture + product + counter-pressure processing):
  - max. 140 N at 4 bar
  - max. 210 N at 6 bar
- Greater lifting force available depending on customer requirements

## Idler with Automatic Tensioning Device

#### Properties



- Pneumatic operation
- Tensioning device guided by linear roller bearings and guide rods
- Vulkolan® cleat pads ensure secure transferring (prevents contamination of the discs by liquid or dulling media)
- 40 mm tensioning distance
- Min. 4 bar required
- Optimal tensioning pressure at 6 bar



## Drive Versions

Vulkolan® pressure pads ensure the secure transfer of pallets around the pulley. Individual pressure pads allow for easy maintenance and replacement.



## Protective Hood Enclosure\* with Pendulum Flap

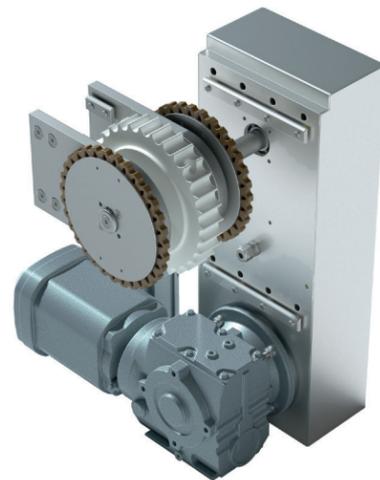
The protective device guard at the ends minimizes the risk of injury for the operator. When the pendulum flap is triggered the entire system stops. A cover between the flat top chain and the frame is available on request.

A protective device guard without a pendulum flap in profile design or as a sheet metal hood is also available as an option.

*\*The customer is responsible for ensuring that the SPU 2040 is correctly guarded based on their application. Additionally the customer is responsible for ensuring that all local, state and federal safety laws and regulations are adhered to. The Protective Hood Enclosure from mk North America is not a substitute for proper guarding.*

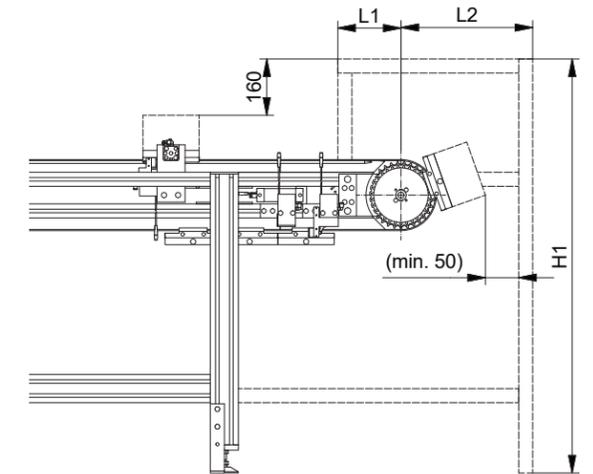
### AF - Direct Drive

### AC - Indirect Drive



- Flange-mounted hollow shaft motor
- Conveyor speeds between 15 and 50 fpm depending on the required cycle time of the pallets, and loading
- Location: left or right at the discharge
- Shaft style torque limiting clutch included
- Motor can be mounted horizontal (as shown) or vertical
- Line speed is adjustable via a variable frequency drive (optional)

- Motor is mounted to a motor plate below the conveyor
- Conveyor speeds between 15 and 50 fpm depending on the required cycle time of the pallets, and loading
- Location: left or right at the discharge
- Shaft style torque limiting clutch included
- Motor can be mounted horizontal (as shown) or vertical
- Line speed is adjustable via a variable frequency drive (optional)



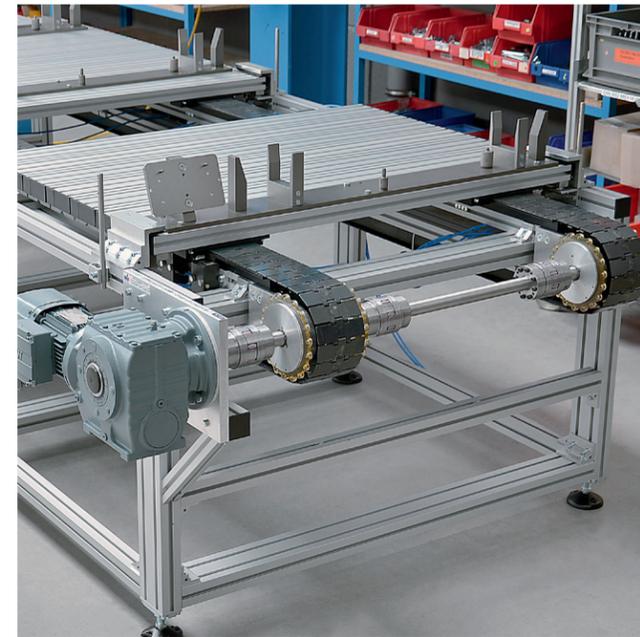
#### Technical data

<b>Length L1 min.</b>	$1/2 \times L_{WT} + 100 \text{ mm}$
<b>Length L2</b>	individual depending on the pallet and workpiece fixture
<b>Height H1 min.</b>	conveyor height $H + H_{WT} + H_{WA} + 160 \text{ mm}$
<b>Width</b>	114 chain width: $B_{WT} + 180 \text{ mm}$ / 190 chain width: $B_{WT} + 344 \text{ mm}$

$H_{WA}$  = workpiece fixture height



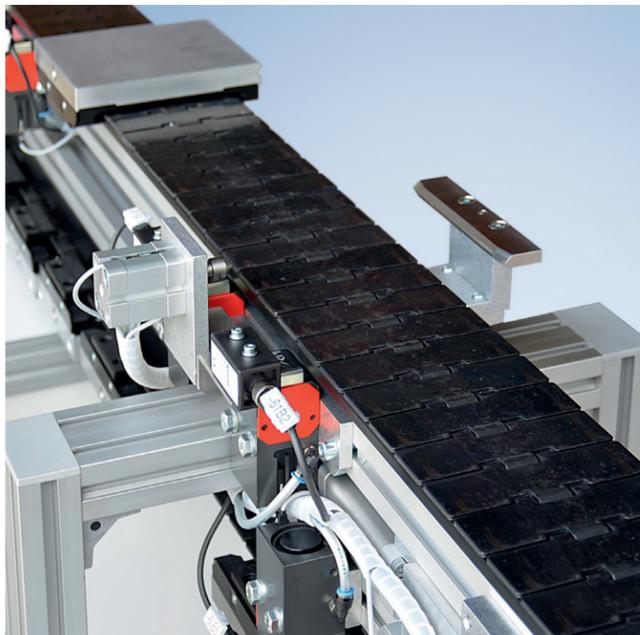
This is a SPU 2040, single lane (190 chain width) carrying a wide aluminum pallet, also featuring a pallet singulator.



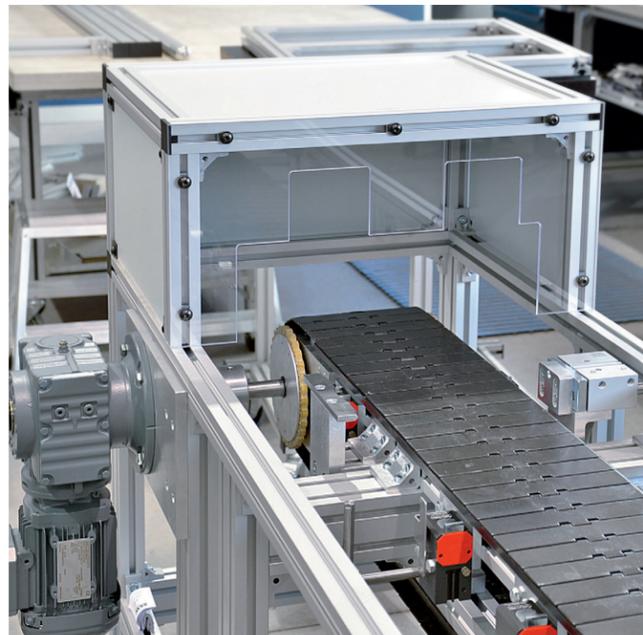
A SPU 2040, wide unit, with segmented profile based custom pallets.



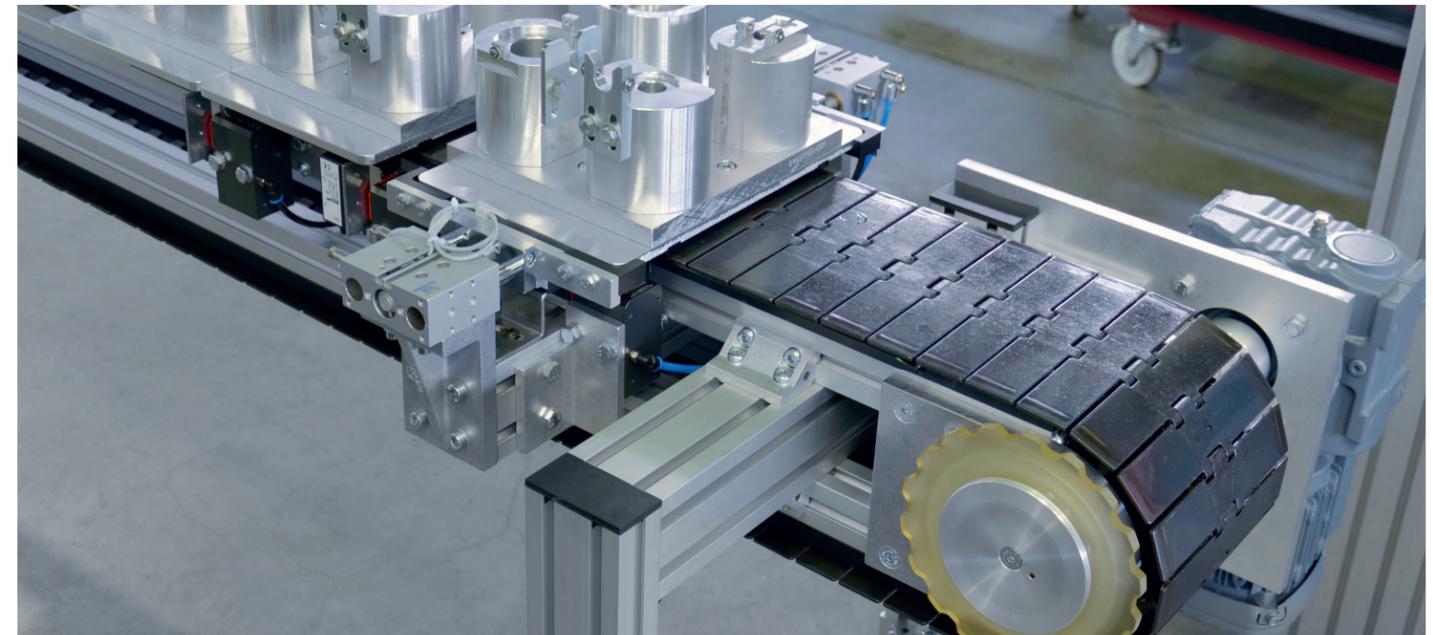
An example of a SPU 2040, single with customer-specific workpiece fixture.



A locating device, with a pallet singulator, is shown on a 114 single wide unit.



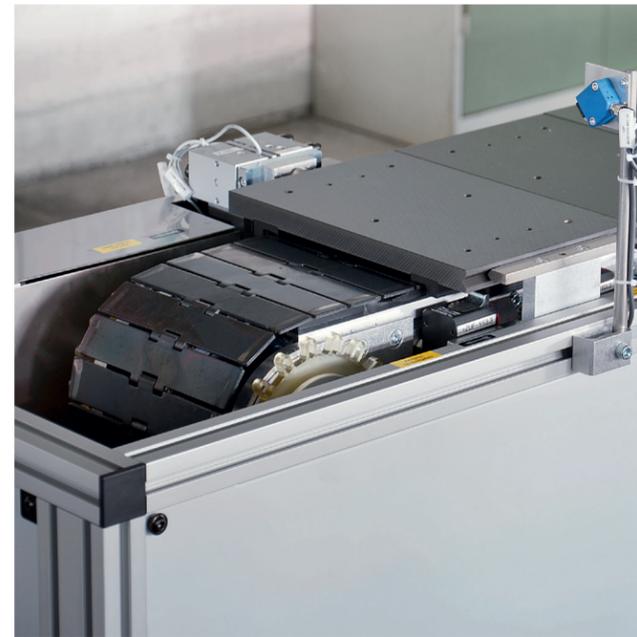
A protective guard with pendulum flap, mounted at the motor (discharge) end of a single lane unit.



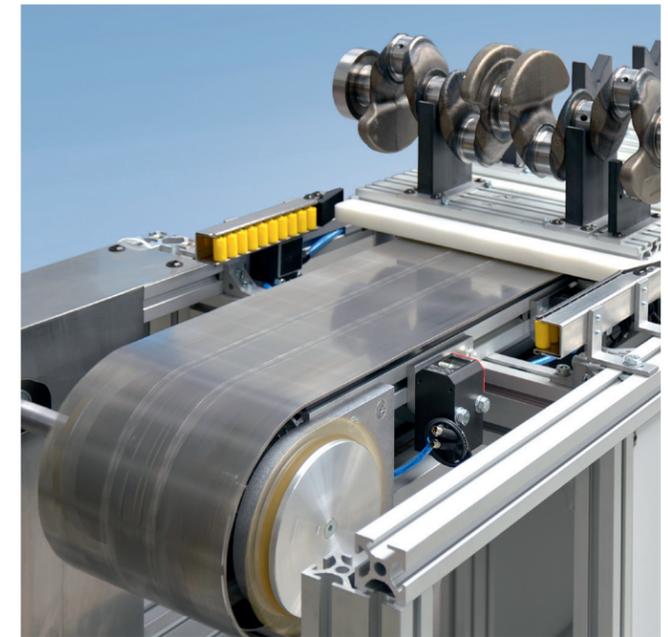
SPU 2040, single line with separating function and custom fixtures, for manual loading and automated removal.



A SPU 2040, with pallet separating function (pallet singulator) for supplying parts in a production facility.



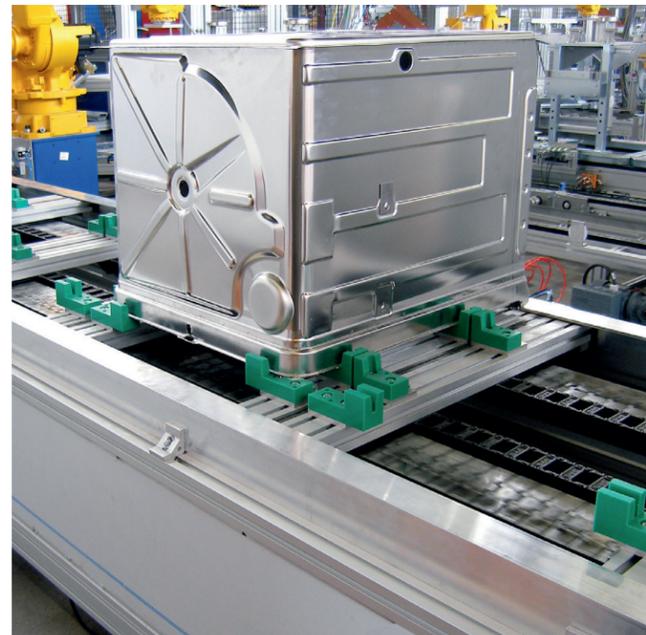
A SPU 2040 with a locating device for manual product removal during continuous operation.



A special chain was used on this SPU 2040, along with roller strips for lateral positioning.



SPU 2040 interlink, dual-line with GUF-P 2000 belt conveyor as discharge belt for rejected parts.



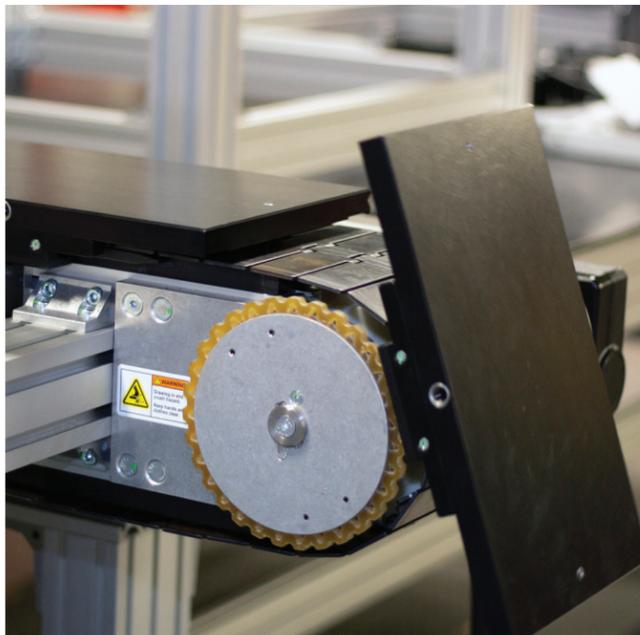
A SPU 2040 wide unit is used as an infeed conveyor for dishwasher units.



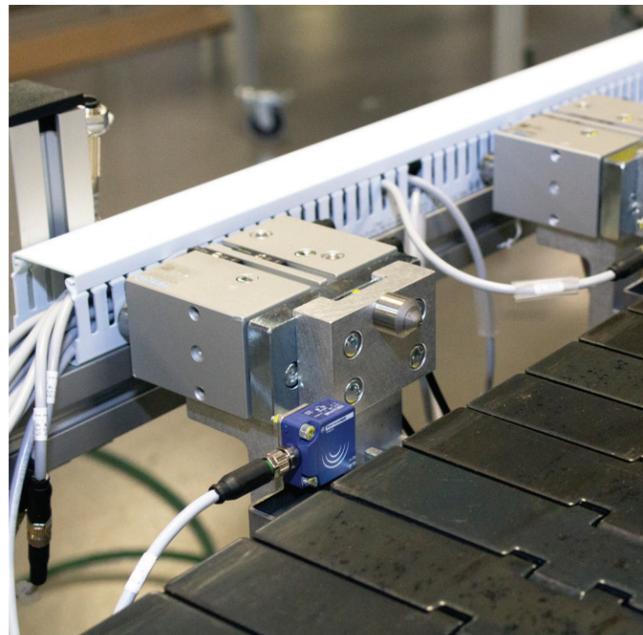
A wide SPU 2040 for supplying parts in an assembly and welding facility



This SPU 2040 wide is carrying two parts on one pallet at once. The parts are queued before being offloaded.



The Vulkolan® pressure pads ensure that the pallet transfers from the top to the return on the underside of the conveyor.



Locating pins are one half of the components that make up the locating device.

## Our Other Products

### Aluminum Conveyors

With over 20 different conveying systems, mk offers a product variety which is unsurpassed in the marketplace. Our broad offering, and more than 30 years of experience in material handling, leads to robust solutions that feature long life and reliable operation while maintaining all the advantages of modular design and expandability.

Our innovative conveying solutions, both standard and custom, have proven themselves in automotive, manufacturing, machine builder & integrators, metal working, packaging, pharmaceutical and printing industries.



### VersaMove Pallet-Handling Conveyor Systems



mk North America manufactures pallet conveyors over three different platforms. This allows for the pallet-handling system to be tailored to meet your specific needs. mk believes in offering not only a better product, but also a better solution. VersaMove pallet-handling conveyors are pre-engineered and modular. The system can be easily expanded or reconfigured as your manufacturing needs change. Our workpiece pallet conveyors can be used in a variety of layouts, or combined for even greater flexibility in planning production processes. [www.mkversamove.com](http://www.mkversamove.com)



### Extruded Aluminum Framing

mk Aluminum Framing Systems feature over 200 different profile shapes and more than 2,700 connectors and system components, all engineered for a precise fit and maximum rigidity. Forget the hassles and inflexibility of steel – the welding, grinding, painting and waiting. mk offers you fast assembly, easy reconfiguration and unlimited flexibility.

With mk Aluminum Framing you can build just about anything you can imagine. Whether it be machine bases, safety enclosures, perimeter guards, tool racks, robot stands, carts, workstations, display units or something else; with mk's aluminum framing, the possibilities are nearly limitless.



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