



# SPU 2040

*Accumulating Pallet Recirculation Systems*



*with automatic return of pallets*



# SPU 2040 Accumulating Pallet Recirculation Systems



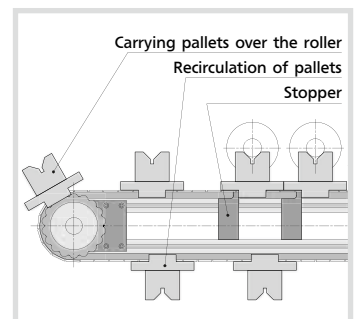
## *Linking. Feeding. Buffering.*

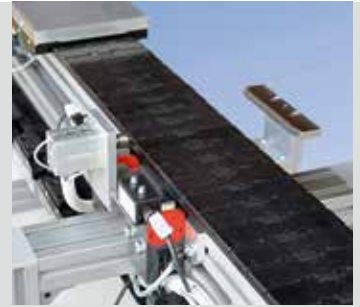
mk – we're one of the leading suppliers of mechanical components, modules and turnkey solutions for factory automation. Our SPU 2040 is an accumulating pallet recirculation system with which we offer you cost-effective linking, feeding, buffering, positioning and separating of workpieces in the smallest possible space. The robustness and the variety of configurations of the system 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 on the pallets are loaded on the upper transport level. After removal of the workpieces the empty pallets are safely carried over the return roller and then conveyed back on the underside of the conveyor. They are

then once again available at the starting point of the conveyor waiting to be loaded with new workpieces. A second conveying level and devices for lifting and lowering are no longer required. Neither is any additional manual or automated loading of pallets necessary.





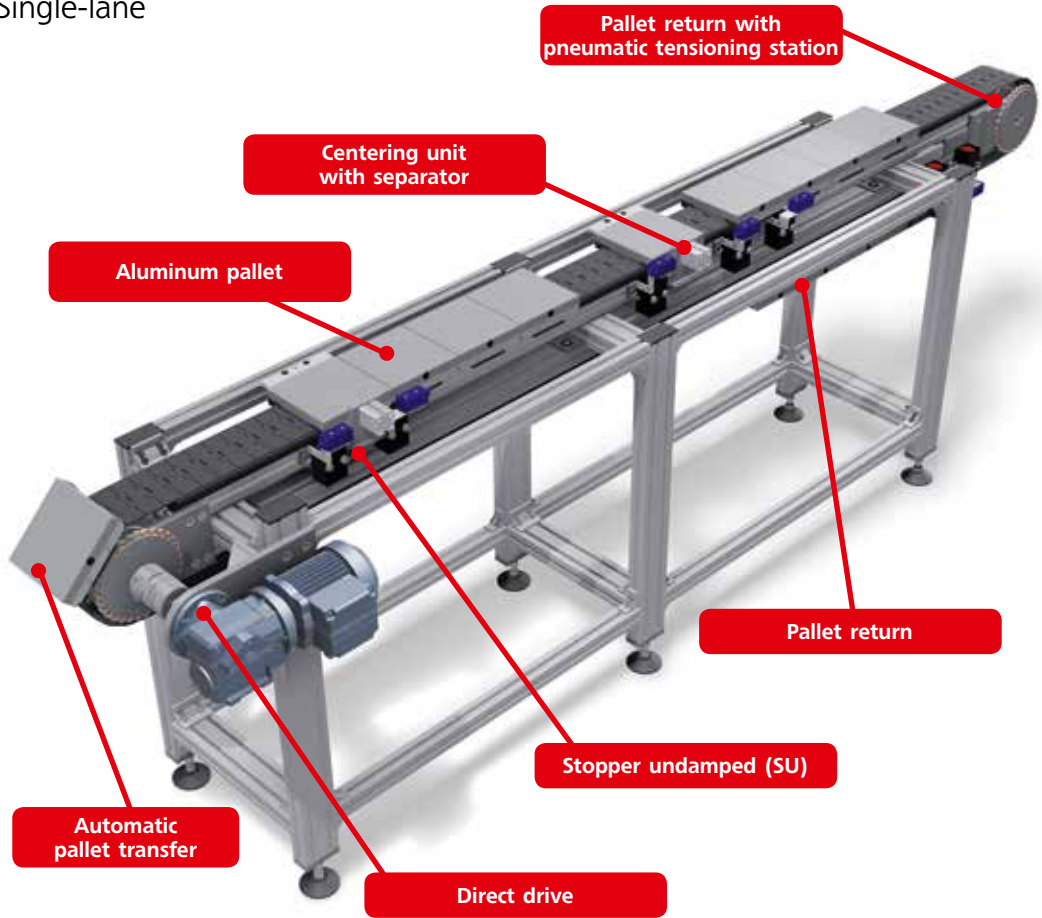
## *Advantages of SPU 2040*

- Cost-effective interlinking of two processing stations
- Process-safe feeding, buffering, positioning and separation
- Compact design with space-saving recirculation of pallets beneath the transport level
- Buffer capacity compensates for varying cycle times within the production line.
- Flexibility as a result of the modular design and variable pallets
- Loading depends on the speed, the maximum value being 300 kg (Single-lane) and 450 kg (Dual- and Double-lane)
- Conveyor lengths ranging from 2 to 10 m
- Speeds ranging from 4 to 15 m/min
- Low friction and low maintenance



# SPU Layout planning

Single-lane



Dual-lane



Double-lane

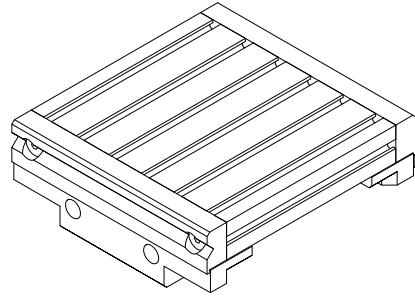


## Modules



### Workpiece carriers/pallets

#### WT 20 pallet



In the case of single or dual-lane systems the lengths of pallets used range from 150 to 350 mm, while the widths of pallets range from 160 to 250 mm.

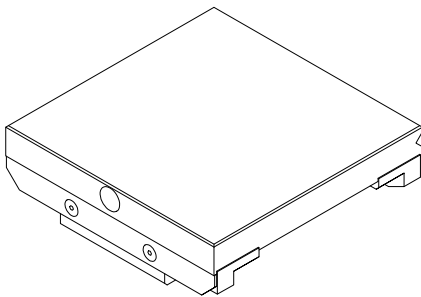
The largest possible pallet weighs max. 3 kg  
 In the double-lane systems the pallet width is determined by the conveyor width.

The pallet loads must be confirmed in advance to determine the center of gravity.

- Total load\* 20 kg
- The carrier plate is made of profile series 40 aluminum
- Lateral locating groove and locating bushing
- POM Slide rails
- The max. weight of workpiece holder is 7.5 kg

System 114	7-20.020-110-000
System 190	7-20.020-111-000

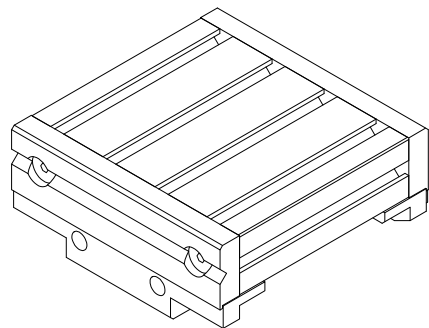
#### WT Aluminum pallet



- Total load\* 25 kg
- Aluminum carrier plate (Hard-Coating is recommended)
- Lateral locating groove and locating bushing ensure extremely precise positioning
- POM Slide rails
- The max. weight of workpiece holder is 7.5 kg

System 114	7-20.020-130-000
System 190	7-20.020-131-000

#### WT 40 pallet



- Total load\* 30 kg
- The carrier plate is made of profile series 40 aluminum
- Preferred for Double-lane systems
- Lateral locating groove and locating bushing
- POM Slide rails
- The max. weight of workpiece holder is 7.5 kg

System 114	7-20.020-120-000
System 190	7-20.020-121-000

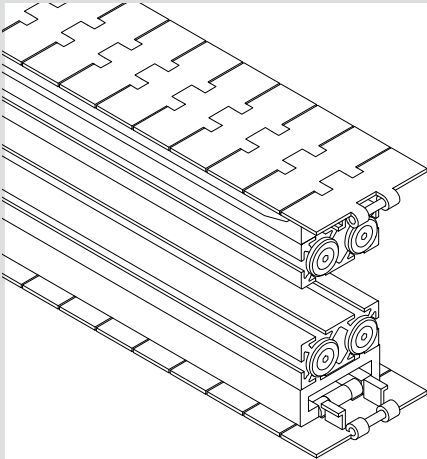
\*Total load: Workpiece carrier/pallet + Workpiece holder + Workpiece

## Modules

### *Transfer line*

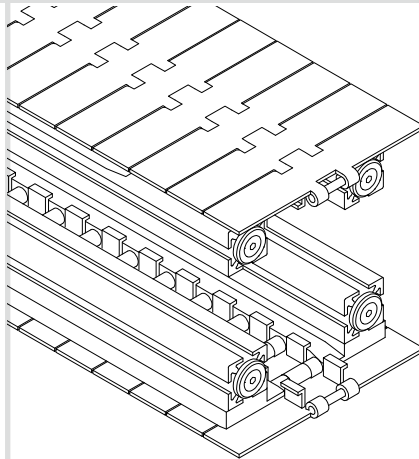
Flat top chain conveyors are available in two different widths. The 114 system is designed using 2 profiles having a cross-section of 40 x 80 mm and can be used as single-lane or a multi-lane option. The 190 system, which is larger, is designed using 4 profiles of cross-section 40 x 40 mm and is used as a single-lane system, if the weight of the workpiece is not concentrated at the center and consequently additional supporting surface is needed. The flat top chain is made of wear-resistant carbon steel.

#### Narrow SPU transfer line



Flat top chain width = 114.3 mm

#### Wide SPU transfer line



Flat top chain width = 190.5 mm

Single-lane 114 system      **7-20.020-210-000**

Double-lane 114 system      **7-20.020-211-000**

Single-lane 190 system      **7-20.020-220-000**

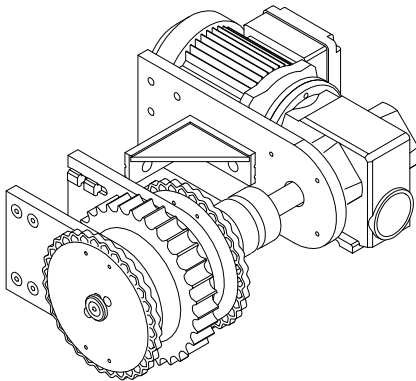
Double-lane 190 system      **7-20.020-221-000**



## Drive

Vulkolan pressure pads ensure secure transfer of pallets over the return rollers. The pallets/workpiece carriers are thus moved automatically beneath the conveyor level with minimum space requirements. Individual pressure pads allow easy replacement.

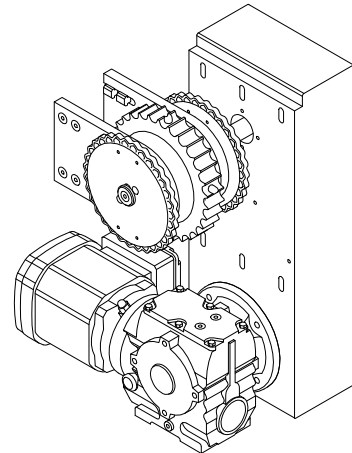
### Direct drive



- Flange-mounted hollow-shaft motor
- Line speed can be adjusted via the motor
- Arrangement is to the right or to the left of the conveyor line
- The driving chain wheel is linked to the motor using a combination of shaft and coupling
- Alternatively, you can use a safety coupling instead of a clamping coupling

System 114	7-20.020-510-000
System 190	7-20.020-512-000

### Indirect drive



- Gear motor with output shaft
- Line speed can be controlled using the motor and the drive sprocket combination.
- Location of the motor: Below the conveyor belt
- Drive assembly to the right or to the left
- Optionally, a safety coupling may be used

System 114	7-20.020-520-000
System 190	7-20.020-522-000

# Modules

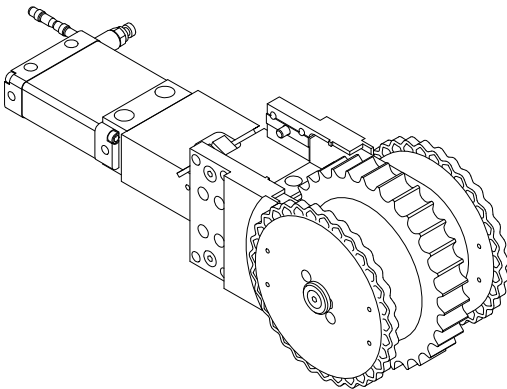
## Return

Vulkolan pressure pads ensure secure transfer of pallets over the return rollers. In order to set the required chain tension, the system provides an automatic or manual tensioning station that is integrated in the return assembly. Tensioning stations are based on the length and the load on the system.

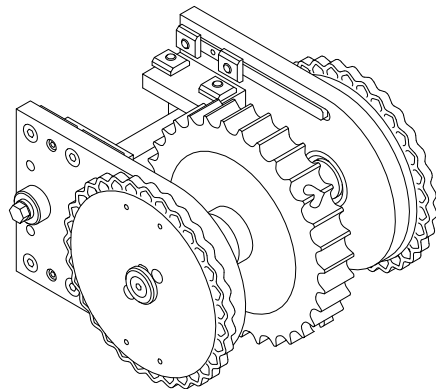


**Return with automatic tensioning station**

**Return with/without manual tensioning station**



- Pneumatic operation
- Space-saving flat cylinders
- Stroke 30 mm
- Guidance of the tensioning station using linear anti-friction bearings and guide rods



- Stroke 35 mm
- Adjustment via an eccentric

System 114	<b>7-20.020-310-000</b>
System 190	<b>7-20.020-325-000</b>

System 114 without tensioning station	<b>7-20.020-314-000</b>
System 190 with tensioning station	<b>7-20.020-321-000</b>

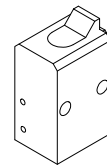




## Stopper/Separator

- Undamped stopping
- Depending on the travel velocity for load up to 400 kg
- Stopper sensing possible electrically or inductively

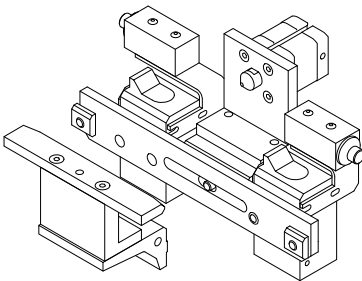
### Stopper SU 400



SU-400 EW electrical sensing	K503011401
SU-400 EW inductive sensing	K503011405

## Centering unit

- Lateral connection to the body of the belt conveyor
- Positioning accuracy of  $\pm 0.2$  mm
- Stopper sensing (SU 400) possible electrically or inductively
- The stopper is installed for both stopping and centering
- Lift using a pneumatic cylinder with a centering pin



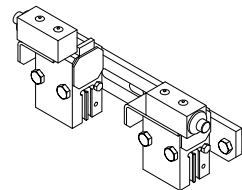
### with separation

System 114	7-20.020-412-000
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### without separation

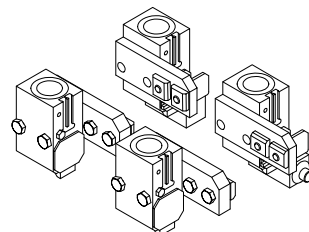
System 114	7-20.020-414-000
System 190	7-20.020-420-000

### Separator at the top



System 114	7-20.020-440-000
System 190	7-20.020-442-000

### Separator at the bottom



System 114	7-20.020-441-000
System 190	7-20.020-443-000

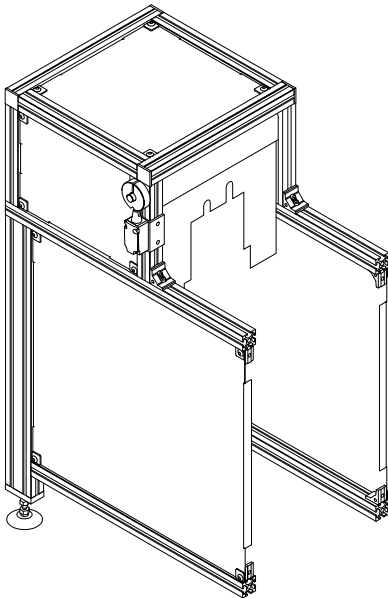


## Modules

### Protective housing

The protective housing at the returns prevents unauthorized access during operation and minimizes the risk of injury to the operator. In the event of an accidental contact an optional pendulum flap gets triggered and stops the entire system. A cover between the flat top chain and the frame can be provided on request.

#### Protective housing with a pendulum flap

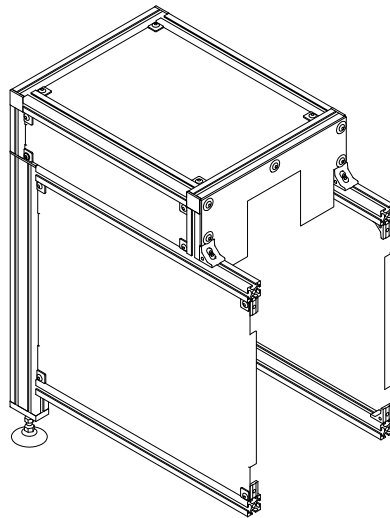


- The protective hood prevents any access at the return
- As soon as it is moved the pendulum flap is triggered and stops the entire system

System 114 and 190

7-20.020-611-000

#### Protective housing, simple



- Available in aluminum profile framing design (shown here) or as a simple sheet metal hood
- The protective hood prevents any access at the return

#### Aluminum profile design

System 114 and 190

7-20.020-613-000

#### Sheet metal hood

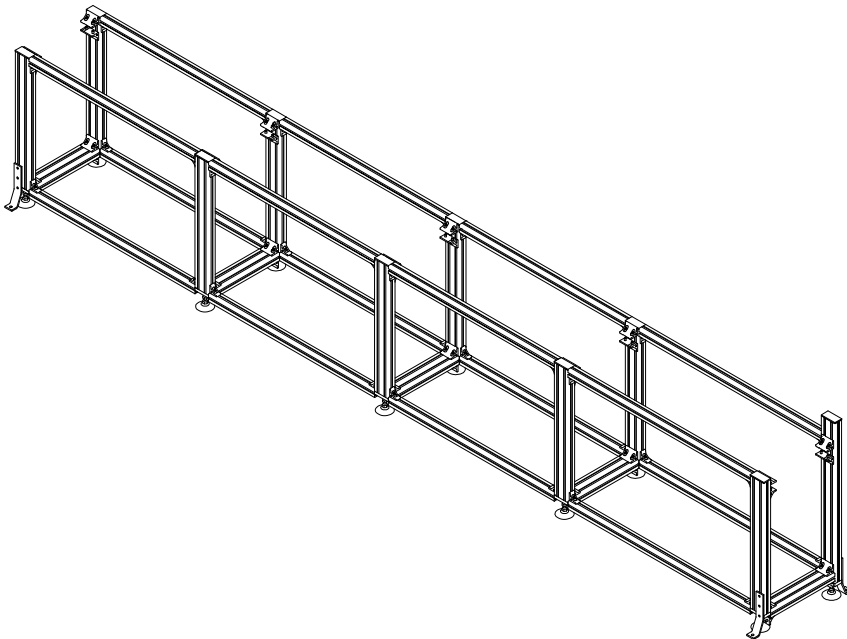
System 114 and 190

7-20.020-614-000



## Frame

The base frame is used for the system to stand securely and firmly, and various working heights can be selected. As an option, the frame is also available with paneling elements (sheet metal or polycarbonate) and with casters as a mobile option. Alternatively, the system can also be configured with individual stands.



Frame with leveling feet	7-20.020-711-000
Stand with leveling feet	7-20.020-711-100
Frame with casters	7-20.020-712-000
Floor mounting	7-20.020-712-100
Stand with casters	7-20.020-712-200

# Application examples



**Accumulating pallet recirculation system with automatic pallet separation function designed for supplying components to a production process**



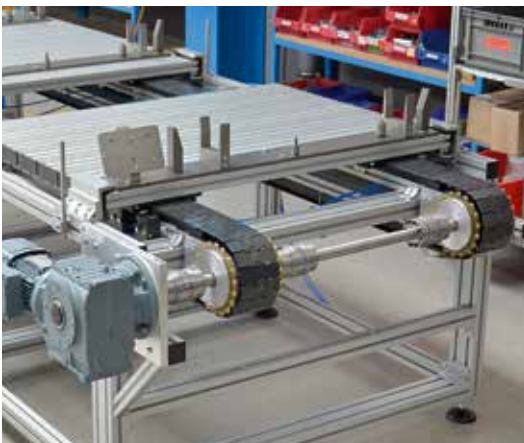
**SPU System 190 with pallet for two workpieces**



**SPU with separation function for manual removal during continuous operation**



SPU with separation function for manual loading and robotic removal



SPU double-lane system 114 with customized pallets



SPU with special chain and lateral positioning via roller strips

## Application examples



**SPU double-lane system with separation function for supplying components to an assembly and welding machine**



**Centering unit for precise positioning of the workpiece carriers**



**Centering unit for separation and stopping**



**SPU double-lane system 114 with separation function designed for supplying components to a production process**



**SPU double-lane system as a conveyor belt of a dishwasher housing**



**SPU double-lane system with belt conveyor GUF-P 2000 as a discharge conveyor for rejected parts**



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