

Chain conveyor system

VarioFlow plus

4.0



Symbols

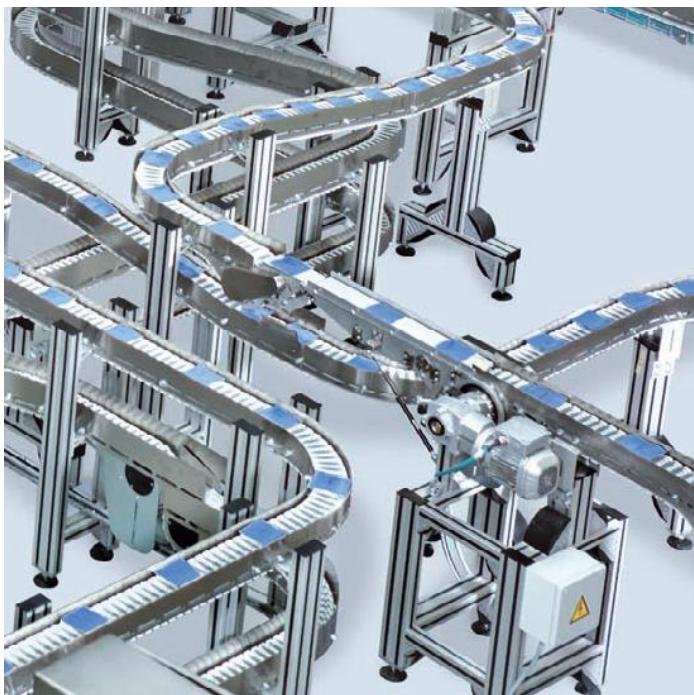
Presentation	Explanation	
 AL	Components for the aluminum system (AL)	
 STS	Components for the stainless steel system (STS)	
 8	 10	1. Profile with slot width 8 mm, 10 mm 2. Accessories suitable for mounting to profiles with the specified slot width
 ESD	Conductive material version in accordance with DIN EN 61340-5-1; suitable for use in ESD-sensitive areas	
Section profile VFplus AL open	L (mm) No.  12 pcs 6070 3 842 546 647  1 pc 50 ... 6000 3 842 996 026/L	Delivery unit  = delivery quantity (here: 12) Order: 1 x 3 842 546 647: Delivery: 12 x section profile VFplus AL open, L = 6070 mm 11 x 3 842 546 647: Delivery: 132 x section profile VFplus AL open, L = 6070 mm
Cross connector AL	b (mm) No.  VFplus 65 65 10 3 842 546 672	Packing unit  = minimum order quantity (here: 10) Order: 1 x 3 842 546 672: Delivery: 10 x 3 842 546 672 (rounded up) 15 x 3 842 546 672: Delivery: 20 x 3 842 546 672 (rounded up)
	Distance, in which the "special chain links" are inserted between the flat conveyor chain links. AZ = spacing distance Example: AZ = 5 = a special chain link follows four flat conveyor chain links	

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VarioFlow *plus* – the innovative chain conveyor system, easily installed, with low-noise operation

Today, user requirements for transport solutions are more demanding than ever. With the VarioFlow *plus*, Rexroth offers a powerful, standardized, and versatile conveyor system for use in the food & packaging industries, health care, assembly lines in automotive & electronics, and machine linking.





The construction kit of the Rexroth VarioFlow *plus* chain conveyor system consists of components that can be used universally for all system widths. This reduces the need for spare parts for the user.

The stable chain permits tensile forces of up to 1250 N. The chain surface is nearly closed, allowing even the smallest of components to be transported safely and reliably. The concept for individual section routing comprises the sizes 65, 90, 120, 160, 240, and 320 in two materials: the basic aluminum version and the stainless steel version for applications with higher hygiene requirements, such as in the food industry. For this, Rexroth uses components made of FDA-compliant materials.

Alternatively, Rexroth offers a workpiece pallet system suitable for transporting workpieces in the automotive and electronic industries.

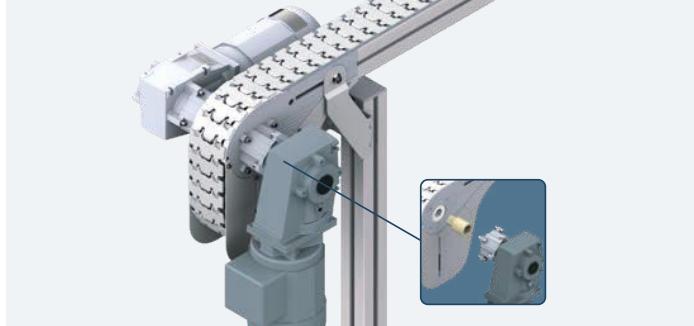


The advantages of VarioFlow *plus*

Flexible planning and fast commissioning thanks to intelligent solutions

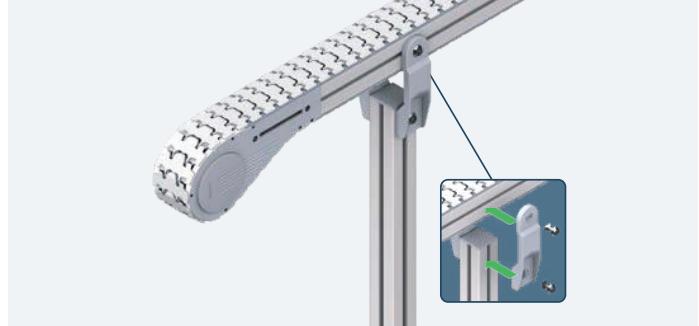
The clever drive solution enables a great degree of planning freedom: the motor mounting position can be

selected on-site. Smart connection technology saves time during assembly and allows for easy conversions and system extensions.

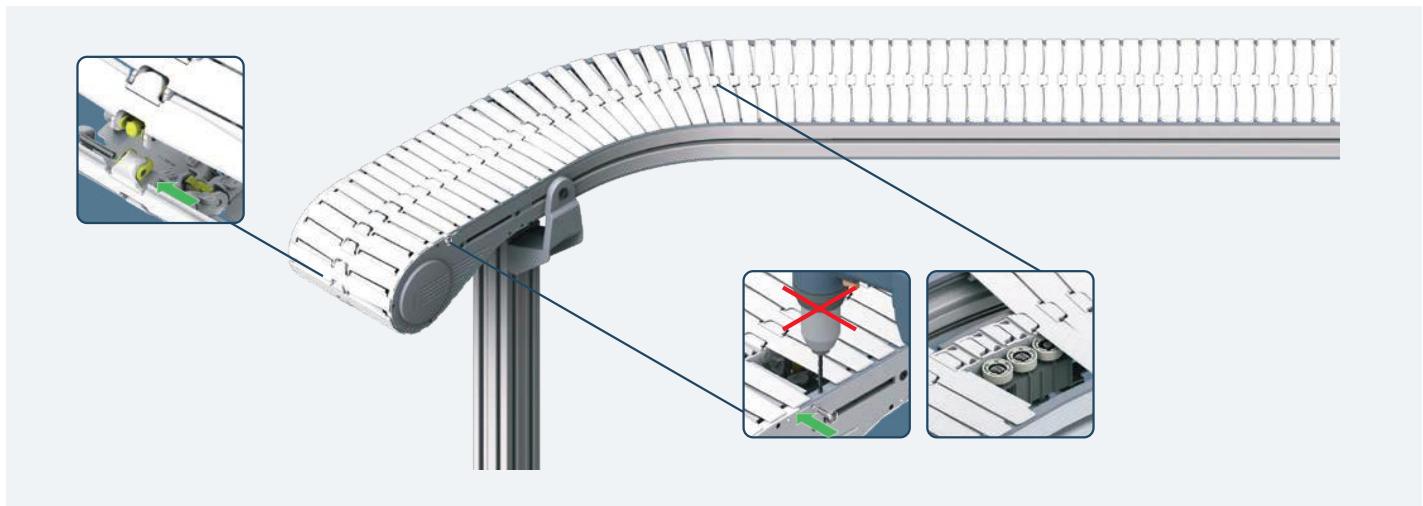


Optimum working conditions thanks to smooth running and easy maintenance

The maintenance-friendly VarioFlow *plus* transport system ensures optimum working conditions. Thanks to improved sliding properties and low friction materials, the working environment is relatively quiet (see p. 334).



Fewer joints and the rolling friction in the horizontal curves ensure low wear and thus reduce downtimes.

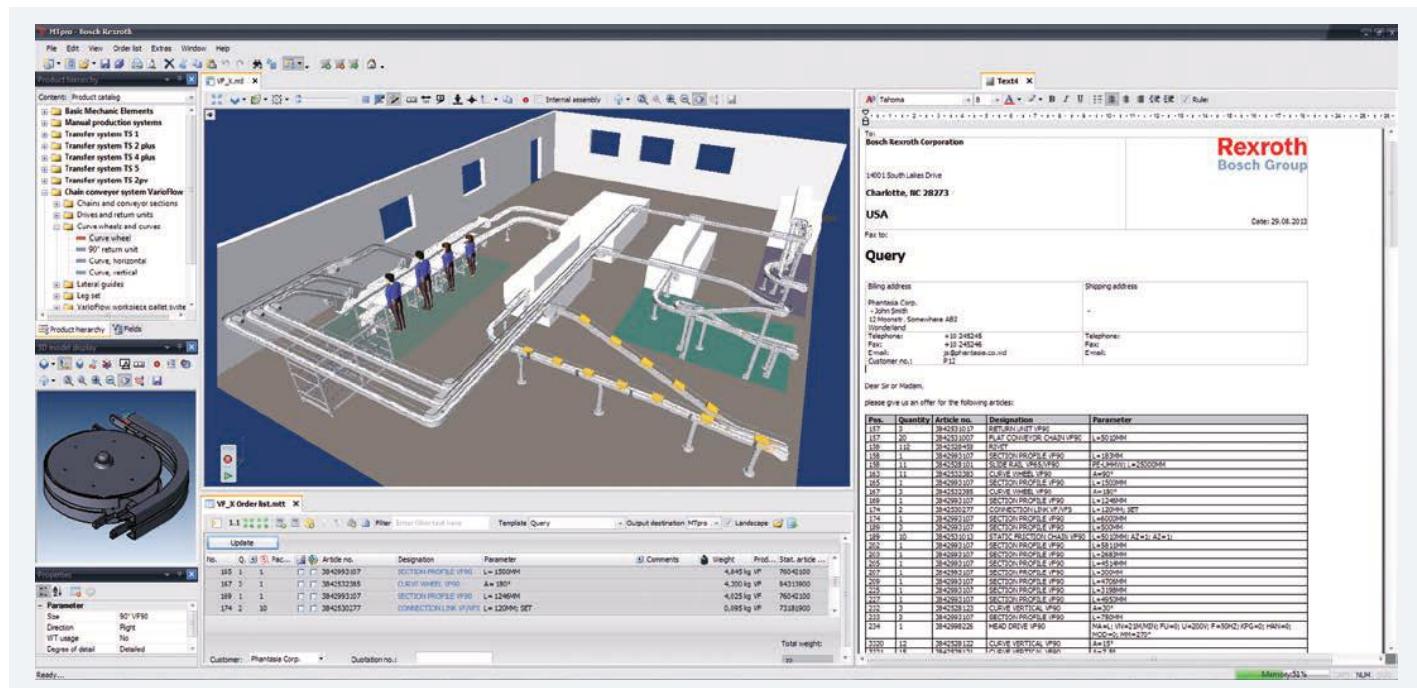


Simple and fast project planning with MTpro

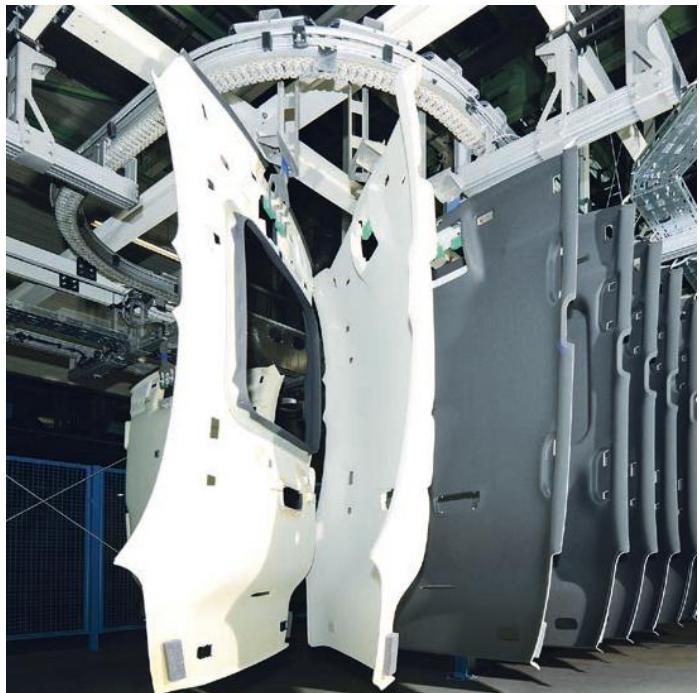
MTpro is an intuitive software program used for planning assembly systems. It assists you from selection to configuration and ordering of the Rexroth products. Components can be selected from the range via drag and drop and assembled quickly and easily using the snap function. Thanks to automatic parts list costing and electronic order integration, you can keep costs under control and minimize time spent ordering.

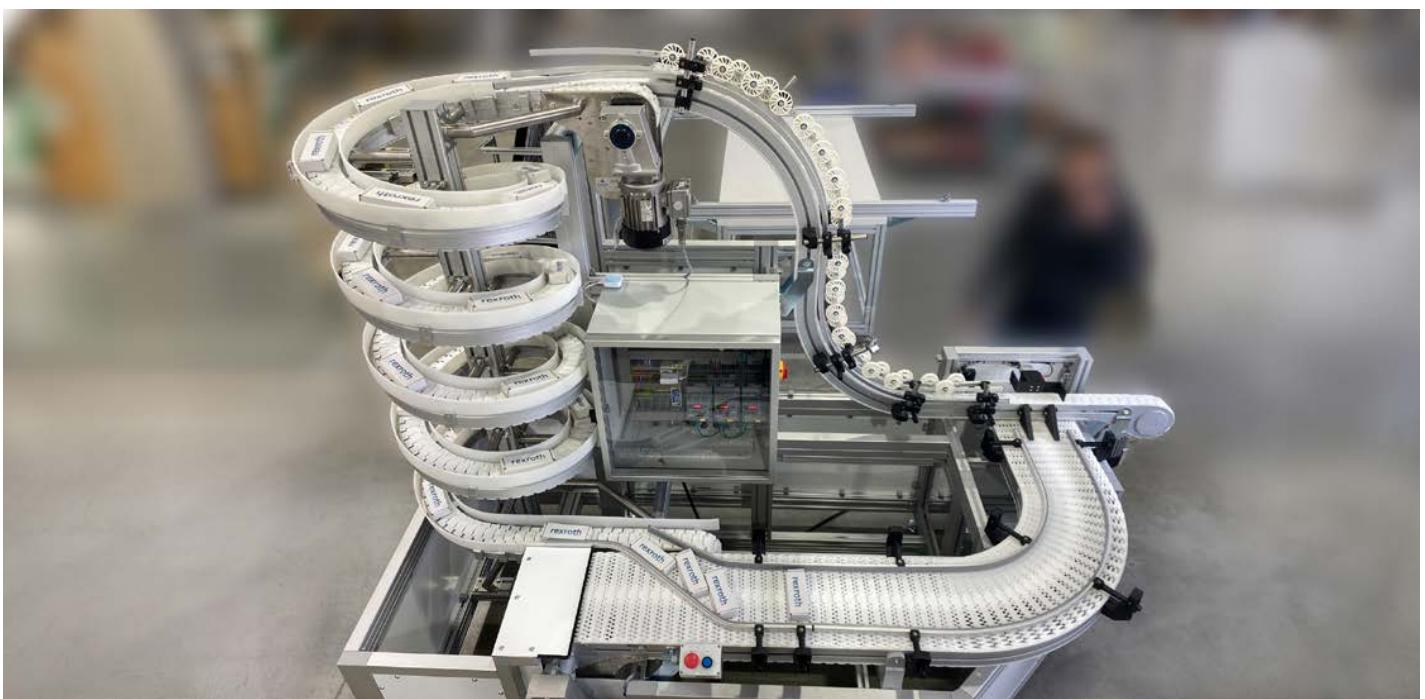
Numerous interfaces allow planning data to be used by other departments, such as Design, Purchasing and Service.

With MTpro you can plan, calculate, and document your assembly systems in just a few steps. The Layout Designer lets you create even complex constructions and system layouts in no time at all.



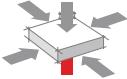
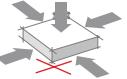
VarioFlow *plus* – for the economical, individual transport of parts





Useful information for selecting and designing a chain conveyor system

Chain conveyor or transfer system

	TS1	TS2 <i>plus</i>	VarioFlow	
	Linking assembly stations and assembly workstations		Horizontal and vertical product transport	
Typical applications	       	     		
Speed	4.5 ... 18 m/min	4.5 ... 18 m/min	4 ... 120 m/min	4 ... 18 m/min
WT size (from ... to)	80 x 80 mm... 160 x 160 mm	160 x 160 mm... 1200 x 1200 mm	Direct transport without WT	65 x 76 mm... 90 x 500 mm
Product weight	3 kg	240 kg	3 kg/34.5 mm with function modules (diverter, positioning unit...) 15 kg without function modules (diverter, positioning unit...)	8 kg
Accessibility				
Section path				
Positioning accuracy	0.015 mm	0.1 mm	0.15 mm	0.15 mm

Aluminum or stainless steel version

Requirements

Harsh, normal (emulsions)	←	Ambient conditions	→	Clean
Yes	←	Food and Drug Administration	→	Yes
Yes	←	Electrostatic discharge	→	No
Alcohol, water	←	Cleaning agents	→	Wet cleaning/use of acid-containing or alkaline cleaning agents (pH value: 5 to 8)
	↓			↓ Stainless steel
Aluminum				

Direct transport or WT transport

The center of gravity location, inherent stability, and the contour of a product determine whether direct transport on a chain conveyor system is suitable or a workpiece pallet is required.

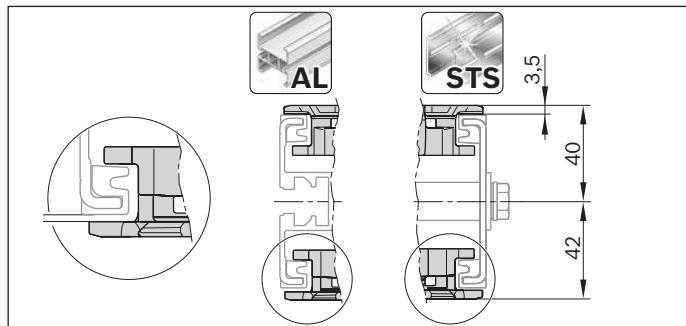
Workpiece pallets can be used when:

- The product has no static stability due to its geometry
- Transport can cause a change in position of the product
- The process requires it
- The product surface is very sensitive
- Accumulation is required and the product geometry does not allow for accumulation
- An exact positioning of the part is required
- The process is controlled via an ID system

System height

The stainless steel (STS) and aluminum (AL) versions have the same system height.

Size: 65-120

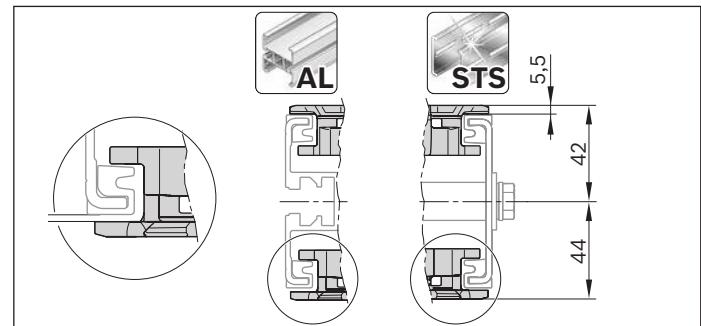


Track width

The selection of the chain conveyor system width is determined by the nature of the product and its dimensions. The maximum width of the conveyed goods is dependent on the form and location of its center of mass.

If products are transported directly, the system width can differ greatly from the product width. It is important for direct transport that the center of the product is as close as possible to the center of the chain and that it has high inherent stability.

Size: 160-320



Load and chain tensile force

The BKBsoft chain calculation program that is integrated into the MTpro planning software allows quick and efficient calculation of the maximum chain tensile force and the corresponding required drive torque.

If the permissible chain tensile force or the drive torque of the gear motor is exceeded, the conveyor section must be examined to determine if the layout can be adjusted accordingly. Among the possible adjustments are splitting of the conveyor section into smaller sections, reduction of the speed, shortening of accumulation sections, and using curve wheels or roller curves instead of sliding curves.

See also the section **Stick-slip effect** on page 310.

Ambient conditions

Abrasive ambient conditions:

When fitting the chain conveyor, pay special attention to the cleanliness of the sliding rails and the section profile. Metal shavings and builder's dust are very abrasive and can cause extreme wear!

During operation, general cleanliness of the system and its environment should be emphasized. This will prolong the service life of sliding rails and chains. Dust and dirt particles, as well as chippings, salt, sugar, etc., are also very abrasive.

Using a chain conveyor system in critical environments is to be checked in each individual case. Please contact your Rexroth representative.

Temperature:

The area of application for VarioFlow *plus* is 0°C to <60°C (ESD: <40°C). Temperatures < 0°C require special gear motors with special lubrication, special seals and special ball bearings (available on request).

Temperatures > 40°C reduce the performance of drive motors and increase the stretching of plastics. This results in a lower chain tensile force. See also section "Technical data" on page 310.

Media resistance:

The materials used are resistant to most chemicals used in industrial applications, even in case of longer contact. See also "Resistance of the chain against chemicals" on page 336.

If in doubt, it is recommended that you ask the manufacturer of the cleaning agent whether the VF material (see material use) is resistant to the cleaning agent.

A resin in the lubricant oil can bond the chain to the sliding rail after longer downtimes. You can remedy this by continual (empty) runs or by cleaning with a normal emulsion on completion.

Humidity:

Operating the VarioFlow *plus* in dry rooms is not permitted; the relative air humidity must be at least 5%.

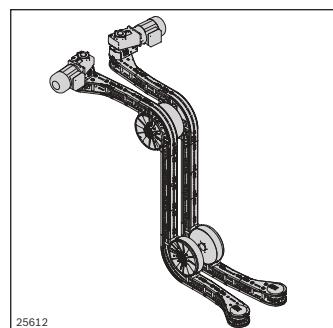
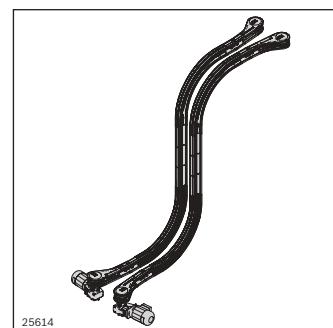
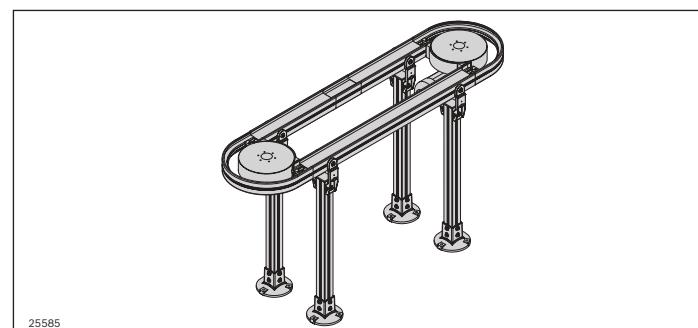
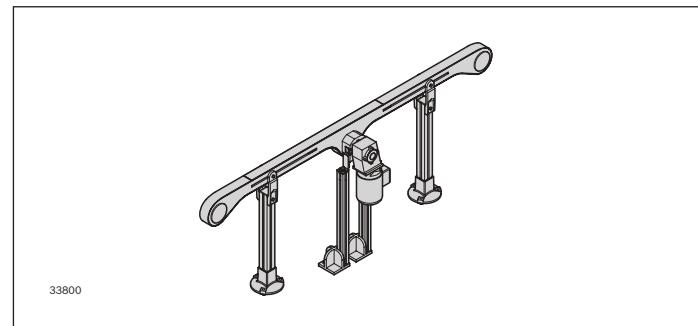
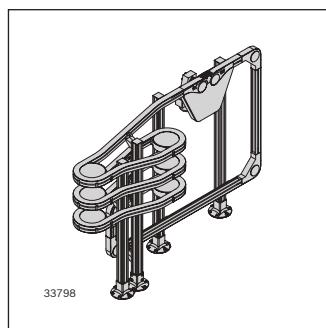
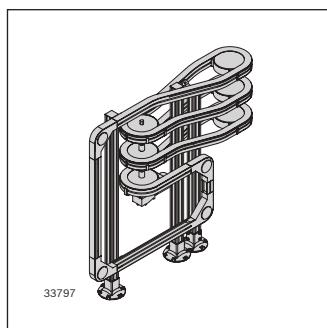
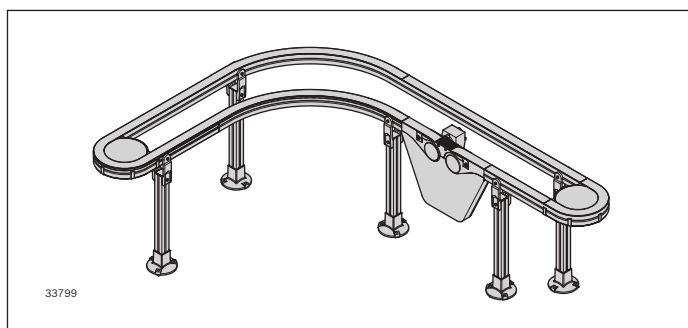
High-pressure cleaning:

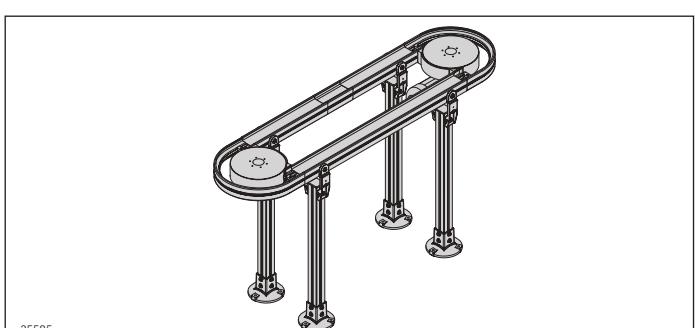
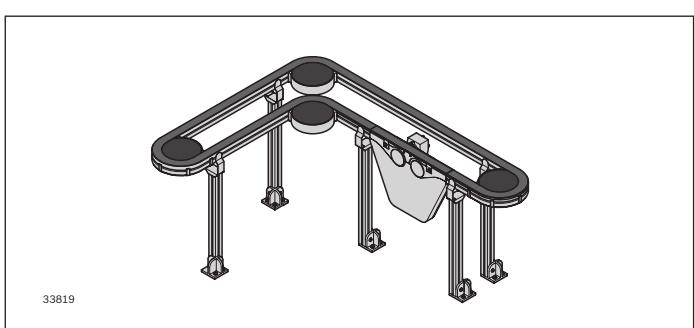
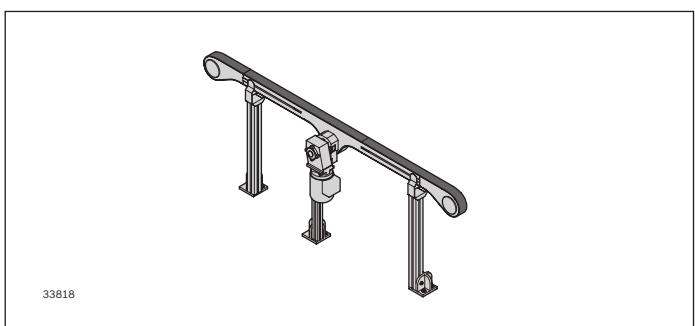
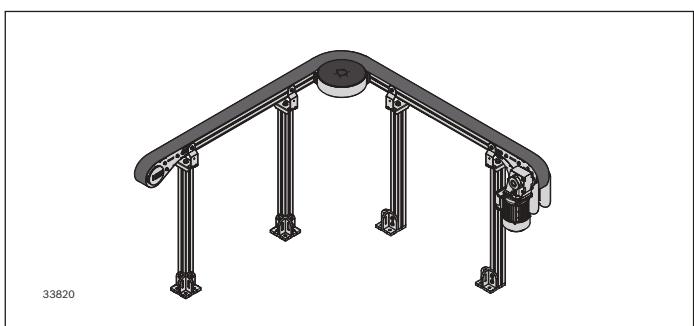
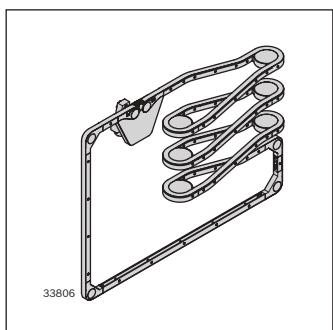
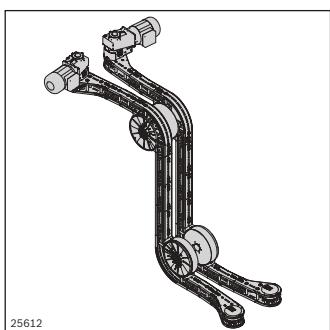
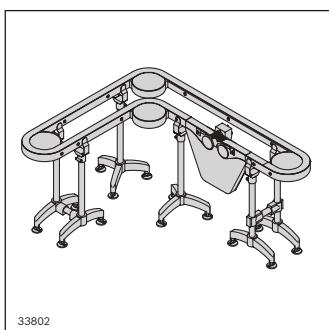
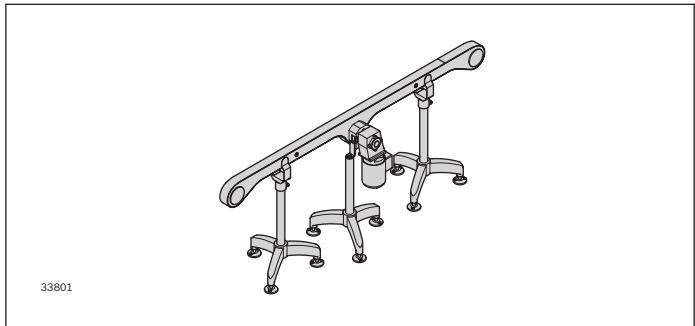
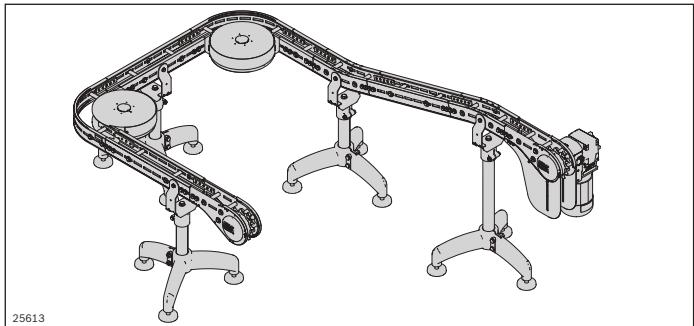
High-pressure cleaning of the chain conveyor ball bearing areas (e.g. in the drive, roller curves, etc.) is prohibited.

System overview

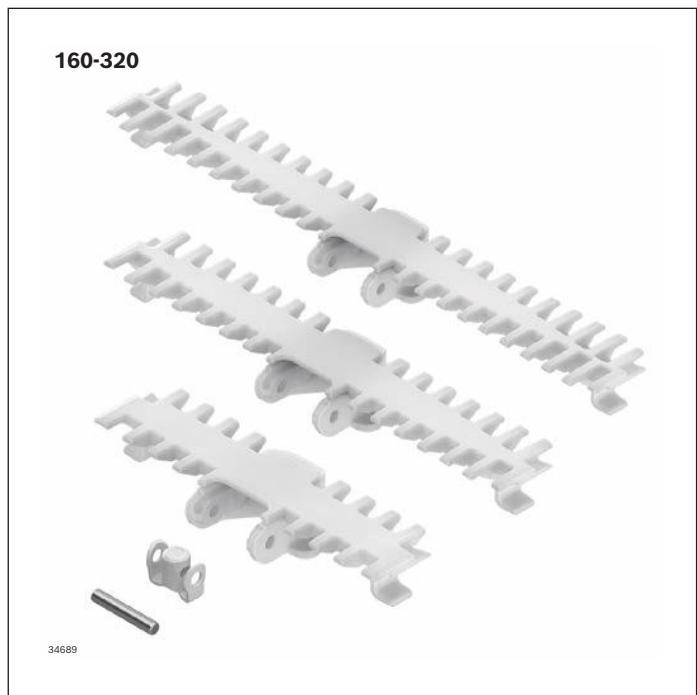
The construction kit with a few basic building blocks in six track widths and two material versions enables a transport system to be adapted to the most diverse requirements.

The system components are available in aluminum (AL) as a basic version or in stainless steel (STS) for increased hygiene requirements (e.g. in the food industry). The ESD system comprises AL, STS and special ESD components.

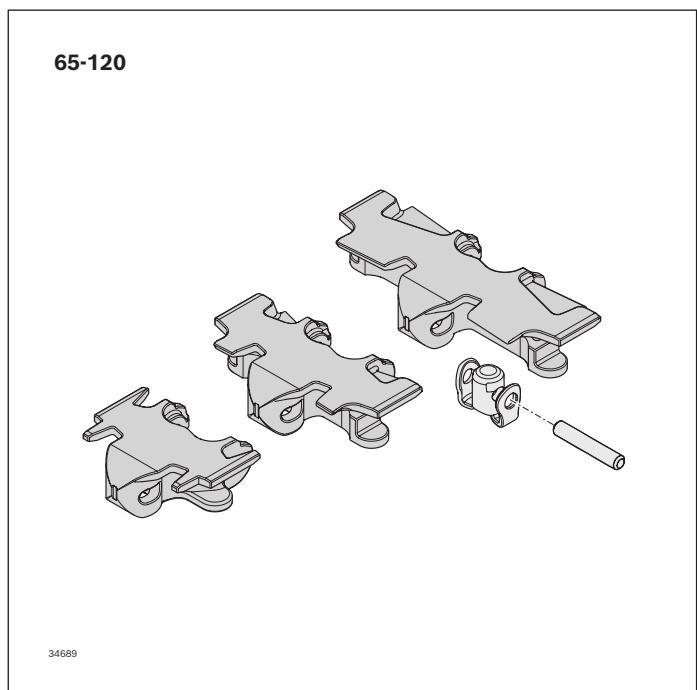




Conveyor chains

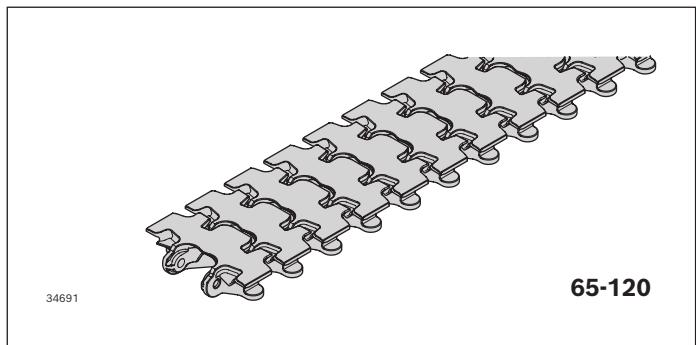
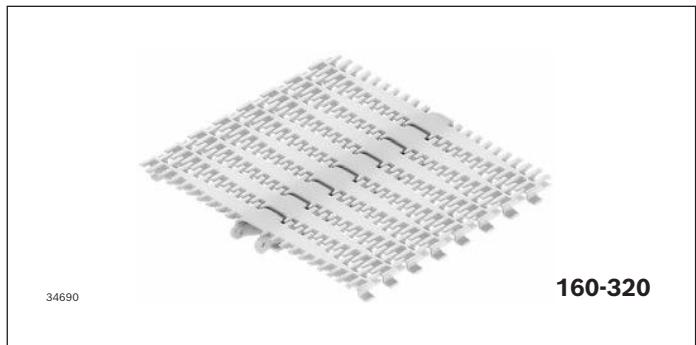


- ▶ Quiet and smooth-running parts transport thanks to patented conveyor chains
- ▶ Optimized antifriction properties of the chains
- ▶ Chain links uncoupled by means of different materials (patented)
- ▶ FDA-compliant materials
- ▶ Low-vibration transport of small parts and accumulation option by covering the chain links
- ▶ Smooth parallel transfer by 2.5×1 chamfer at outer edges of chain links
- ▶ Wide variety of chain types suitable for different applications



	Flat conveyor chain	18
	Static friction chain	22
	Accumulation roller chain D11, roller cleated chain D11	26
	Roller cleated chain D20	30
	Roller cleat D35	32
	Cleated chain	36
	Universal chain	38
	Steel-plated chain	42
	Flocked chain	44
	Wedge chain	46

Flat conveyor chain



- ▶ Drilling the flat conveyor chain links allows for the simple attachment of superstructures. Sizes 65-120 have a mold cavity for accommodating a flat M5 hexagon nut. Sizes 160-320 have a centering aid mounted on the underside of the chain plate. Max. drilling up to $\varnothing 5$ mm, since at this point there are no interfering contours in the chain conveyor, see p. 21

Required accessories for individual chain links:

- Chain pin and pivot pin, see p. 19

Optional accessories:

- Static friction chain link, see p. 22
- Accumulation roller chain link D11, see p. 26
- Roller cleated chain link D20, see p. 30
- Cleated chain link, see p. 36
- Universal chain link, see p. 38

The flat conveyor chain is used to transport products directly or indirectly via workpiece pallets.

The gray conveyor chain is mainly used to transport products indirectly via workpiece pallets, in particular for steel wear pads. The dark coloring means that there is virtually no visual impairment of the chain surface.

- Transport on ascending or descending sections up to about 7° possible, depending on the product (test required)
- Accumulation operation permitted, depending on the product
- Maximum chain tensile force: 1250 N
- Size gray chain: 65, 90
- Chain links can be combined with other types of chains of the same size
- Chain also available in version ESD, see conveyor chain ESD on page 198
- From size 160: Improved trap guard by overlapping chain plates

- ▶ Extremely quiet chain running thanks to the patented chain design
- ▶ Materials meet the requirements of EU 10/2011 and FDA CFR 21 (does not apply for conveyor chain gray)

Scope of delivery:

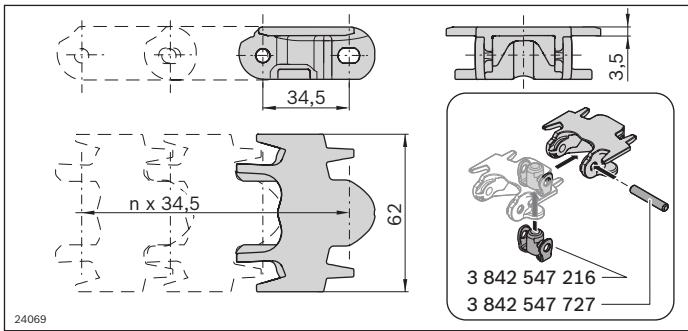
- Chain: complete, incl. chain pin and pivot pin

Condition on delivery:

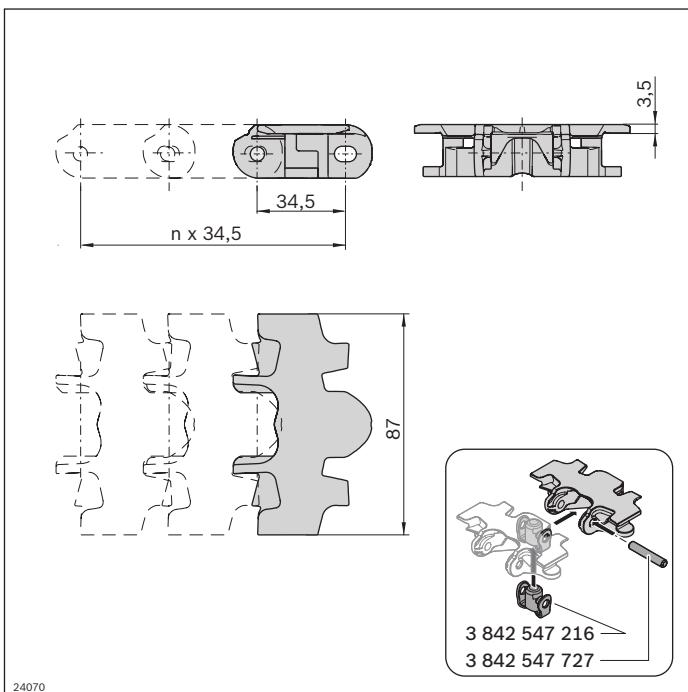
- Chain: Fully assembled

Material:

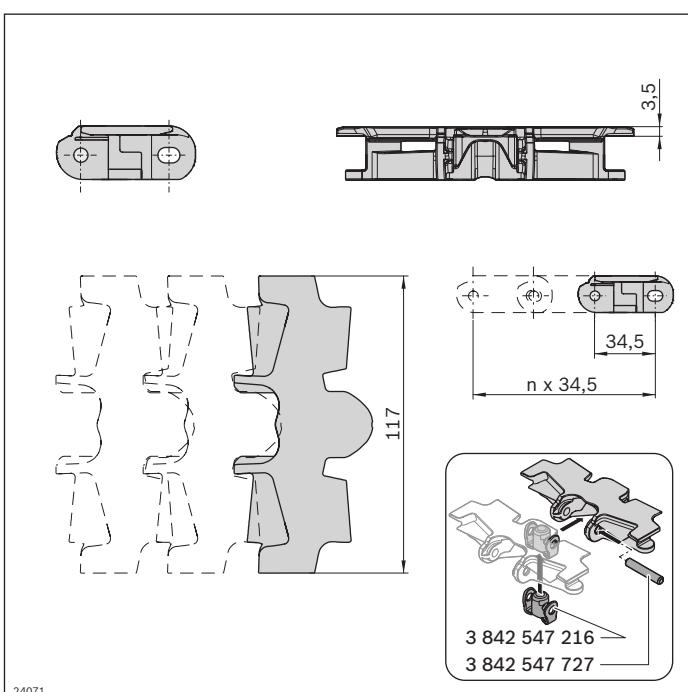
- Chain link: POM
- Chain plate: POM
- Chain pin: Non-rusting steel 1.4301
- Pivot pin: PA66

**Flat conveyor chain VFplus 65 L (mm)  No.**

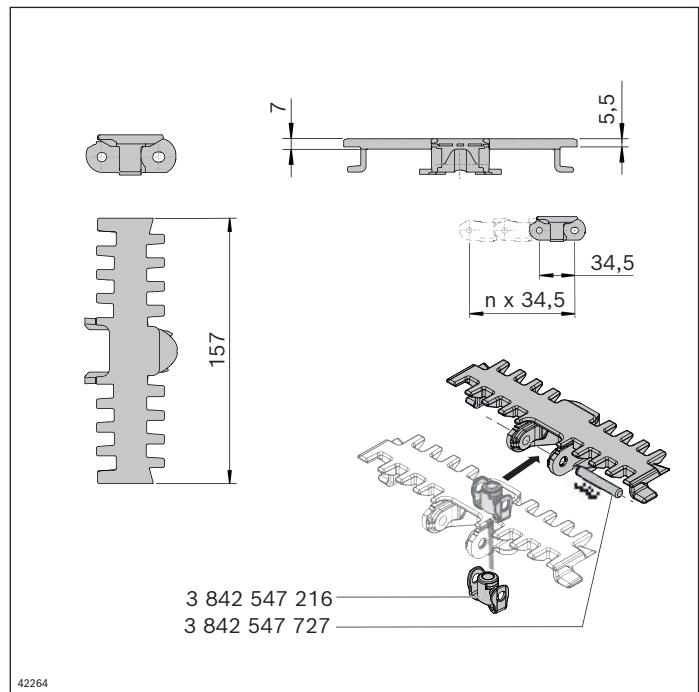
Conveyor chain	4968	1	3 842 546 069
Chain link	10		3 842 546 000
Conveyor chain, gray	4968	1	3 842 546 075
Chain pin	100		3 842 547 727
Pivot pin	100		3 842 547 216

**Flat conveyor chain VFplus 90 L (mm)  No.**

Conveyor chain	4968	1	3 842 546 070
Chain link	10		3 842 546 001
Conveyor chain, gray	4968	1	3 842 546 076
Chain pin	100		3 842 547 727
Pivot pin	100		3 842 547 216

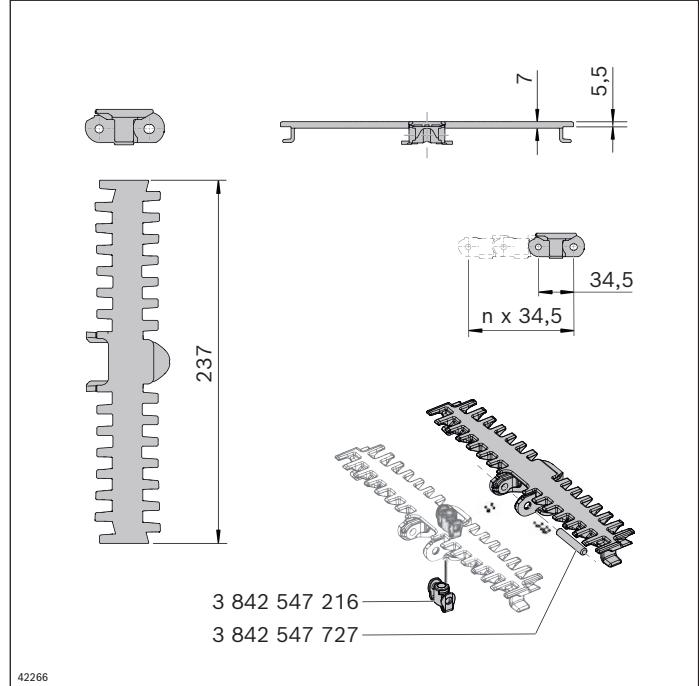
**Flat conveyor chain VFplus 120 L (mm)  No.**

Conveyor chain	4968	1	3 842 546 071
Chain link	10		3 842 546 002
Chain pin	100		3 842 547 727
Pivot pin	100		3 842 547 216



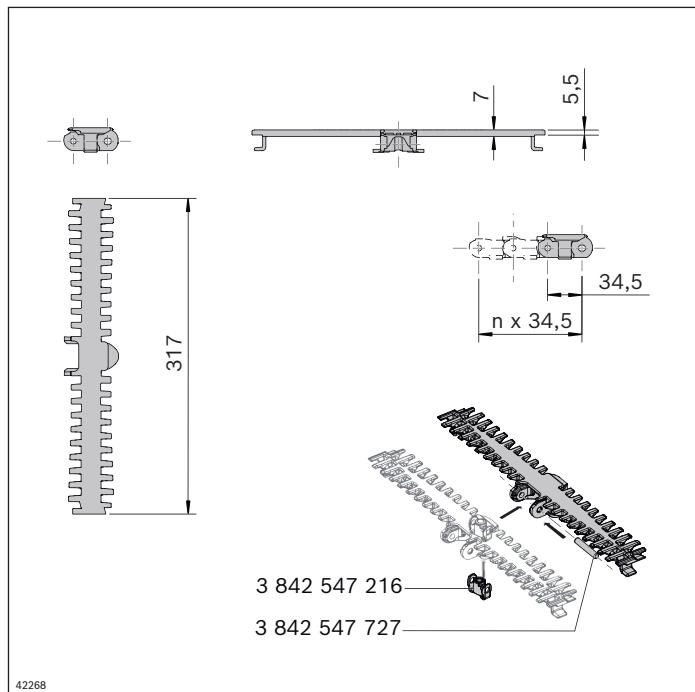
Flat conveyor chain t7 VFplus 160		L (mm)	No.
Conveyor chain t7	2898	1	3 842 571 251
Chain link t7	10	3 842 571 241	
Chain pin		100	3 842 547 727
Pivot pin		100	3 842 547 216

42264



Flat conveyor chain t7 VFplus 240		L (mm)	No.
Conveyor chain t7	2898	1	3 842 571 252
Chain link t7	10	3 842 571 242	
Chain pin		100	3 842 547 727
Pivot pin		100	3 842 547 216

42266

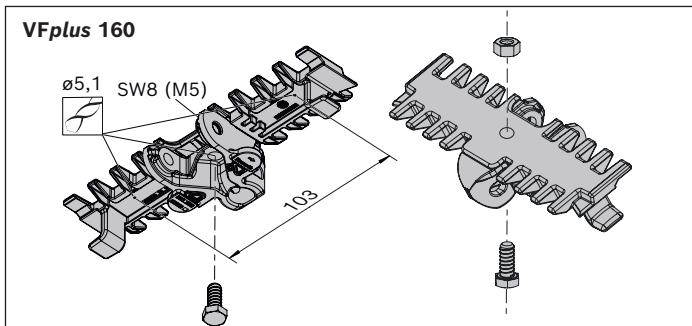


Flat conveyor chain t7 VFplus 320	L (mm)	No.
Conveyor chain t7	2898	1 3 842 571 253
Chain link t7	10	3 842 571 243
Chain pin	100	3 842 547 727
Pivot pin	100	3 842 547 216

42268

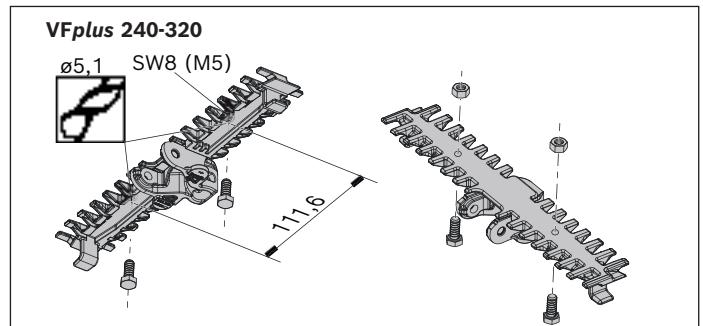
Notice for the attachment of superstructures

VFplus 160

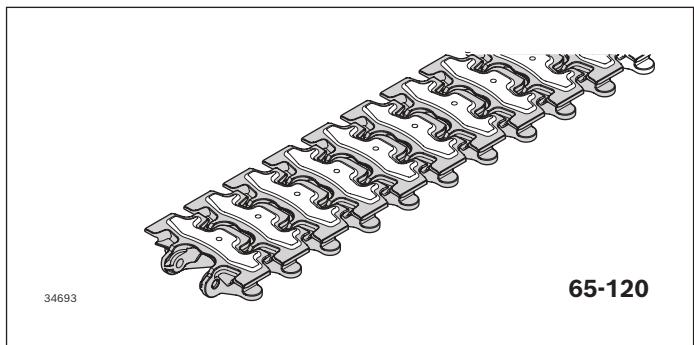
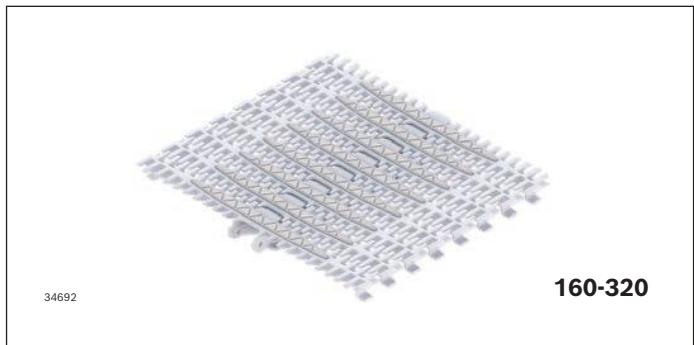


VFplus 240-320

Notice: Risk of collision! Only use the mounting points provided.



Static friction chain



The static friction chain enables the transport of products on ascending or descending sections.

The number of chain links with static friction lining can be specified by the user depending on the product size, weight and the inclination.

- Transport on ascending or descending sections up to about 30° possible. The maximum gradient depends on the product surface, section length, and speed (test required).
- Accumulation operation not permitted
- Maximum chain tensile force: 1250 N
- Only suitable for dry operation
- $AZ \geq 2$: Static friction chain supplemented with flat conveyor chain links (AZ = spacing distance)
- $AZ = 1$: All chain links with static friction coating
- The grip is maintained through regular cleaning
- The chain coating is not suitable for transporting sharp-edged objects
- From size 160: Improved trap guard by overlapping chain plates

- ▶ Extremely quiet chain running thanks to the patented chain design
- ▶ Materials meet the requirements of EU 10/2011 and FDA CFR 21

Required accessories for individual chain links:

- Chain pin and pivot pin, see p. 23

Scope of delivery:

- Chain: complete, incl. chain pin and pivot pin

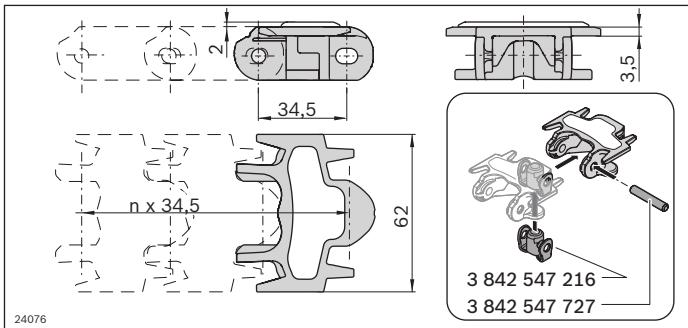
Material:

- Chain link: POM
- Static friction coating: TPE Shore 70A
- Chain pin: Non-rusting steel 1.4301
- Pivot pin: PA66

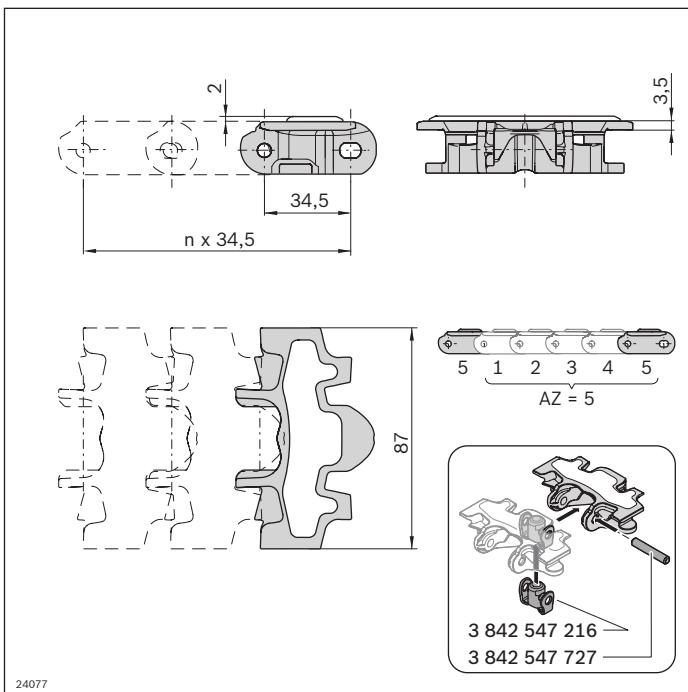
- ▶ Extensive static friction lining for transporting product securely

Condition on delivery:

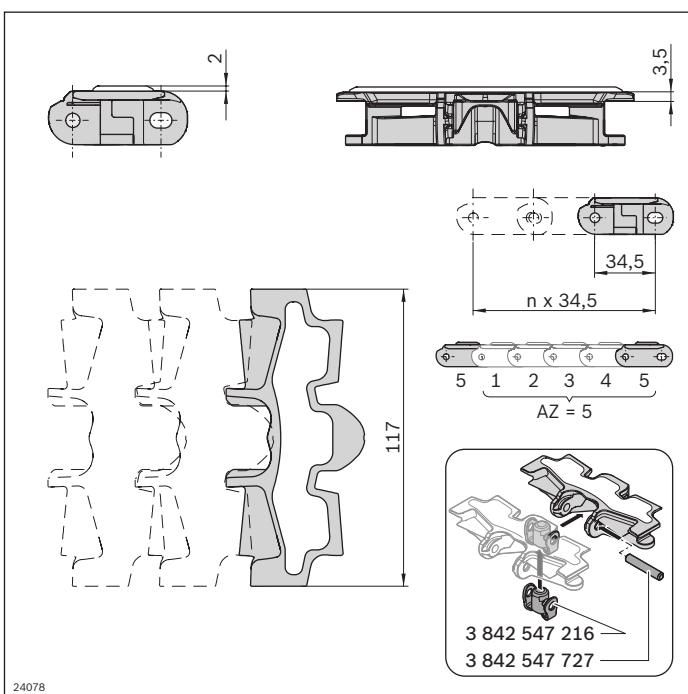
- Chain: Fully assembled

**Static friction chain VFplus 65 L (mm)  No.**

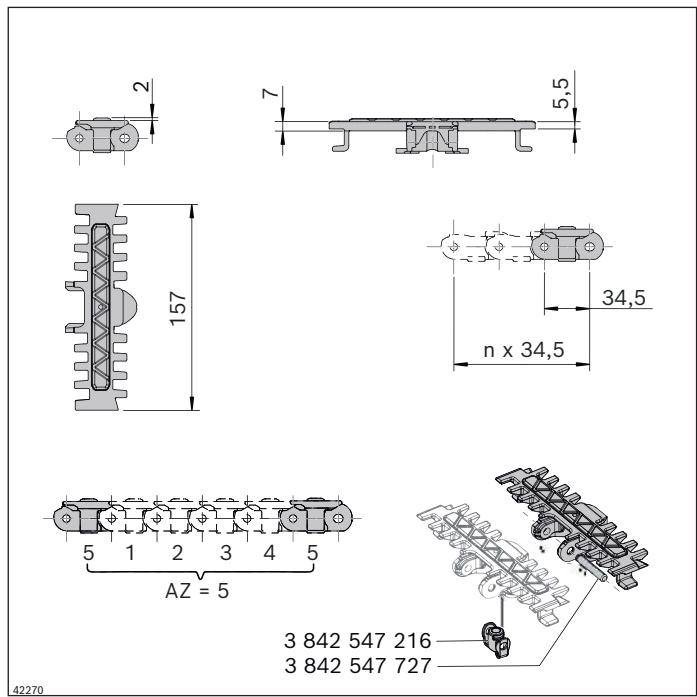
Conveyor chain; AZ = 1	4968	1	3 842 546 077
Conveyor chain; AZ = 2 ... 84	2898	1	3 842 998 706/AZ
Chain link		10	3 842 546 006
Chain pin		100	3 842 547 727
Pivot pin		100	3 842 547 216

**Static friction chain VFplus 90 L (mm)  No.**

Conveyor chain; AZ = 1	4968	1	3 842 546 078
Conveyor chain; AZ = 2 ... 84	2898	1	3 842 998 707/AZ
Chain link		10	3 842 546 007
Chain pin		100	3 842 547 727
Pivot pin		100	3 842 547 216

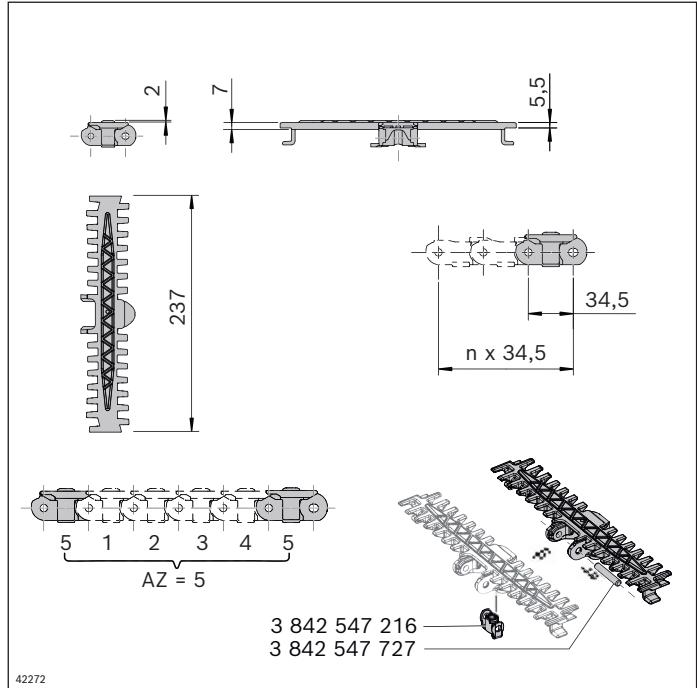
**Static friction chain VFplus 120 L (mm)  No.**

Conveyor chain; AZ = 1	4968	1	3 842 546 079
Conveyor chain; AZ = 2 ... 84	2898	1	3 842 998 708/AZ
Chain link		10	3 842 546 008
Chain pin		100	3 842 547 727
Pivot pin		100	3 842 547 216



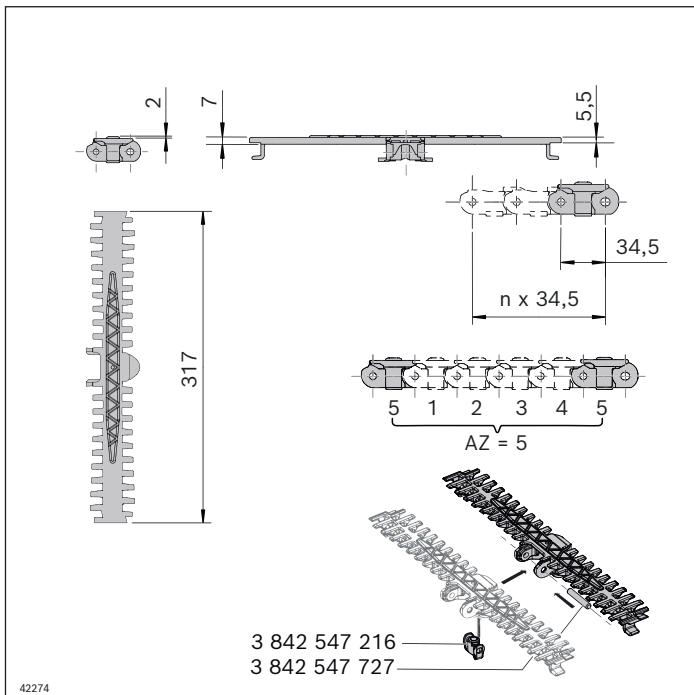
Static friction chain t7 VFplus 160		L (mm)	No.
Conveyor chain t7; AZ = 1		2898	1 3 842 571 254
Conveyor chain t7; AZ = 2 ... 84		2898	1 3 842 996 489/AZ
Chain link t7		10	3 842 571 244
Chain pin		100	3 842 547 727
Pivot pin		100	3 842 547 216

42270



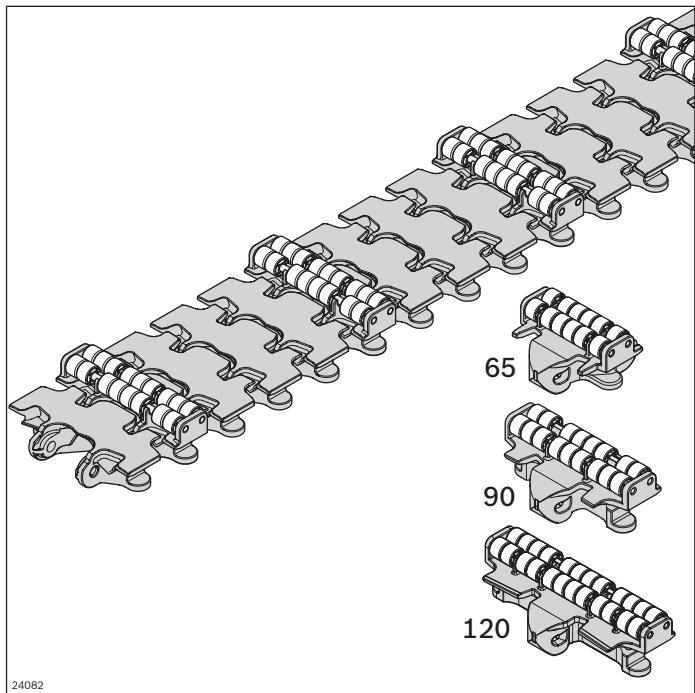
Static friction chain t7 VFplus 240		L (mm)	No.
Conveyor chain t7; AZ = 1		2898	1 3 842 571 255
Conveyor chain t7; AZ = 2 ... 84		2898	1 3 842 996 490/AZ
Chain link t7		10	3 842 571 245
Chain pin		100	3 842 547 727
Pivot pin		100	3 842 547 216

42272



Static friction chain t7 VFplus 320	L (mm)	No.
Conveyor chain t7; AZ = 1	2898	1 3 842 571 256
Conveyor chain t7; AZ = 2 ... 84	2898	1 3 842 996 491/AZ
Chain link t7	10	3 842 571 246
Chain pin	100	3 842 547 727
Pivot pin	100	3 842 547 216

Accumulation roller chain D11, roller cleated chain D11



The accumulation roller chain D11 ($AZ = 1$) enables the surface-protecting and exclusively horizontal transport of sensitive products, even in accumulation operation.

Use as a roller cleated chain ($AZ \geq 2$) enables the vertical transport of small products. See also "Layout instructions for roller cleated chains", on page 34

- The maximum gradient when using cleats depends on the product geometry (test required)
- Accumulation operation permitted when used as accumulation roller chain ($AZ = 1$)
- Accumulation operation not permitted when used as roller cleated chain ($AZ \geq 2$)
- Maximum chain tensile force: 1250 N
- $AZ \geq 2$: Roller cleated chain supplemented with flat chain links ($AZ = \text{spacing distance}$)
- $AZ = 1$: continuous accumulation roller chain
- Product length for use with the accumulation roller chain: ≥ 70 mm

- Extremely quiet chain running thanks to the patented chain design
- Materials meet the requirements of EU 10/2011 and FDA CFR 21

Required accessories for individual chain links:

- Chain pin and pivot pin, see p. 27

Scope of delivery:

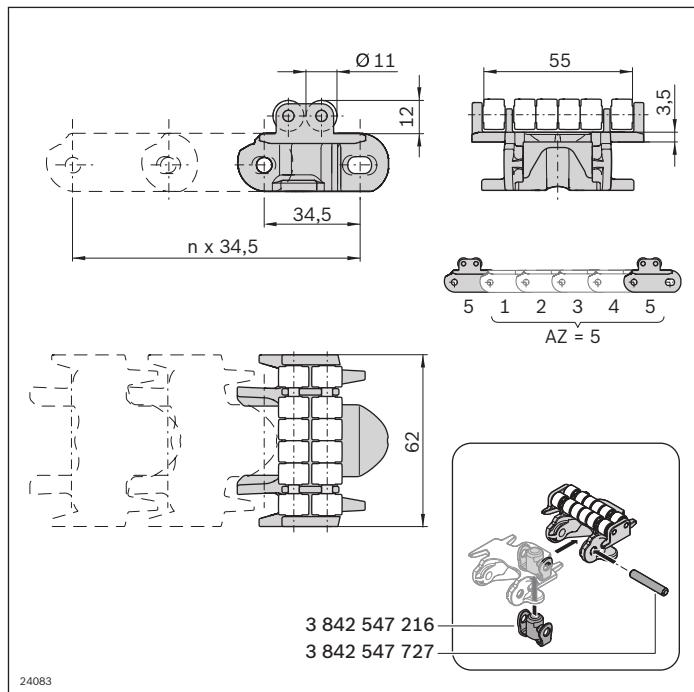
- Chain: complete, incl. chain pin and pivot pin

Material:

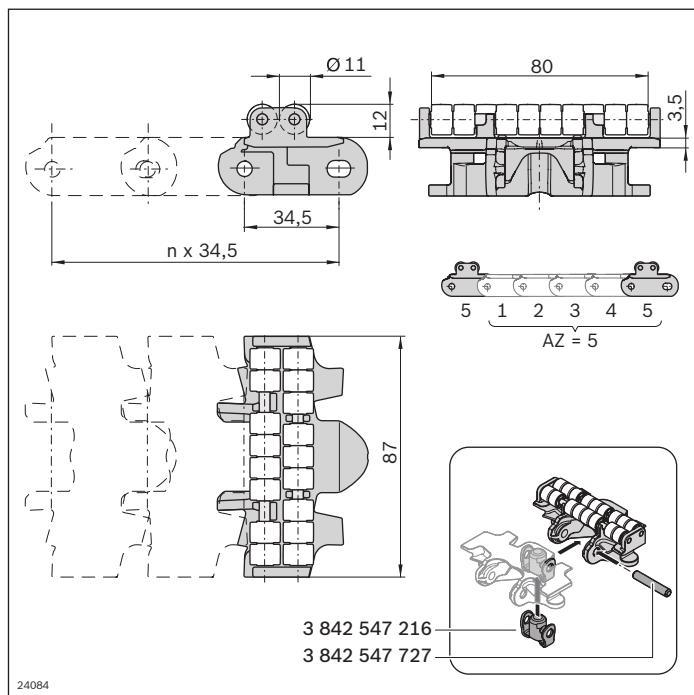
- Chain link: POM
- Roller: POM
- Chain pin: Non-rusting steel 1.4301
- Pivot pin: PA66

Condition on delivery:

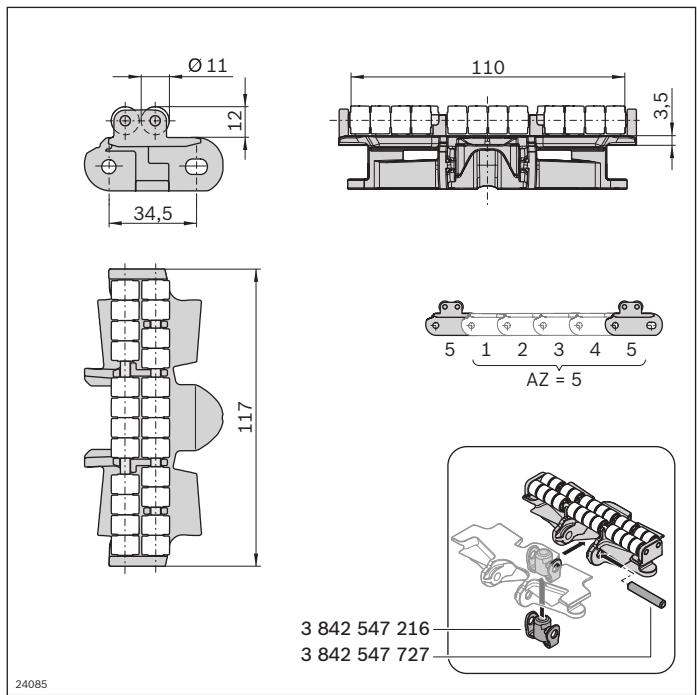
- Chain: Fully assembled



Accumulation roller chain	L (mm)	No.
D11 VFplus 65		
Conveyor chain; AZ = 1	2898	1 3 842 546 083
Conveyor chain; AZ = 2 ... 84	2898	1 3 842 998 717/AZ
Chain link	10	3 842 546 017
Chain pin	100	3 842 547 727
Pivot pin	100	3 842 547 216

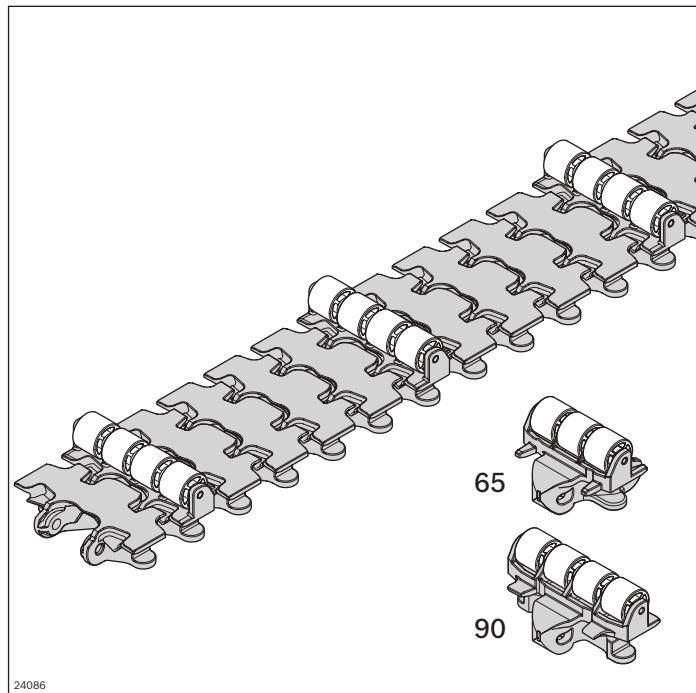


Accumulation roller chain	L (mm)	No.
D11 VFplus 90		
Conveyor chain; AZ = 1	2898	1 3 842 546 084
Conveyor chain; AZ = 2 ... 84	2898	1 3 842 998 718/AZ
Chain link	10	3 842 546 018
Chain pin	100	3 842 547 727
Pivot pin	100	3 842 547 216


**Accumulation roller chain D11 L (mm)
VFplus 120**

			No.
Conveyor chain; AZ = 1	2898	1	3 842 546 085
Conveyor chain; AZ = 2 ... 84	2898	1	3 842 998 719/AZ
Chain link		10	3 842 546 019
Chain pin		100	3 842 547 727
Pivot pin		100	3 842 547 216

Roller cleated chain D20



The roller cleated chain D20 enables the transport of products on ascending or descending sections.

See also "Layout instructions for roller cleated chains", on page 34

- The maximum gradient depends on the product geometry (test required)
- Accumulation operation not permitted
- Maximum chain tensile force: 1250 N
- $AZ \geq 2$: Roller cleated chain supplemented with flat conveyor chain links (AZ = spacing distance)

- ▶ Extremely quiet chain running thanks to the patented chain design
- ▶ Materials meet the requirements of EU 10/2011 and FDA CFR 21

Required accessories for individual chain links:

- Chain pin and pivot pin, see p. 31

Scope of delivery:

- Chain: complete, incl. chain pin and pivot pin

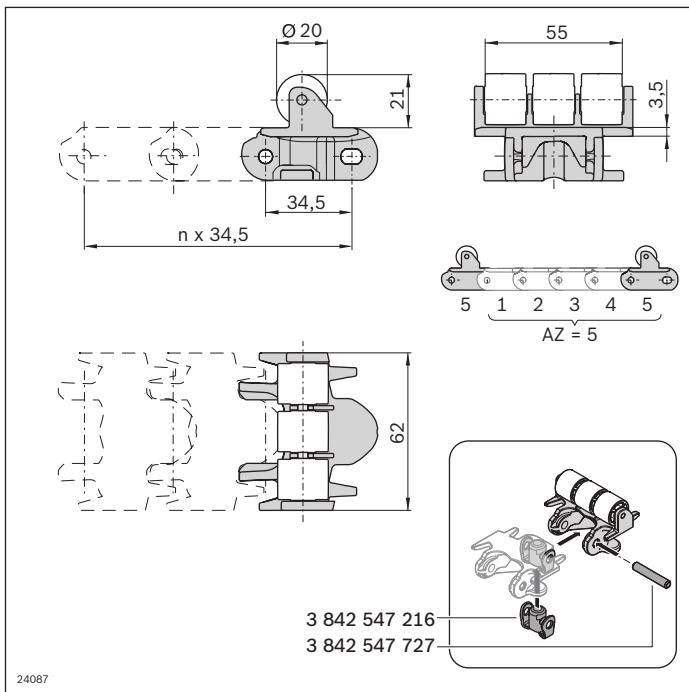
Material:

- Chain link: POM
- Roller: POM
- Chain pin: Non-rusting steel 1.4301
- Pivot pin: PA66

- ▶ For feeding without any effort for cycle time adjustment

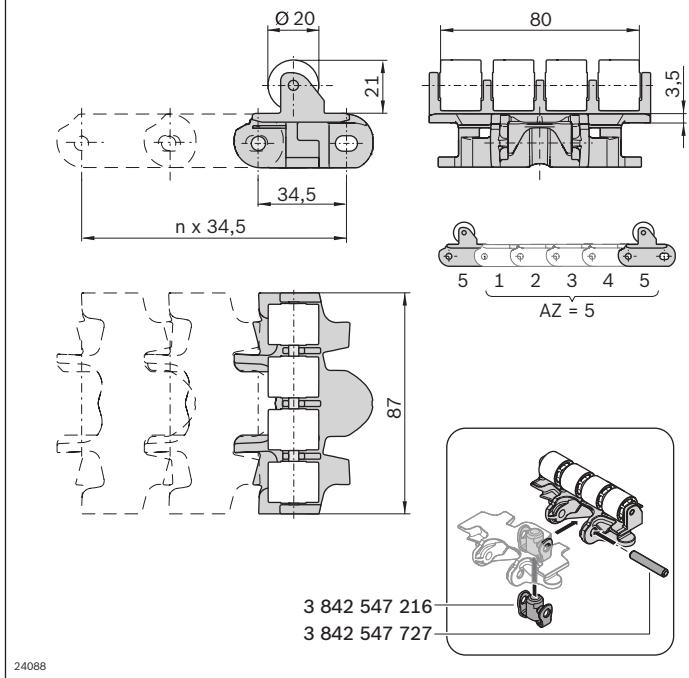
Condition on delivery:

- Chain: Fully assembled



Roller cleated chain D20 **L (mm)** **No.**
VFplus 65

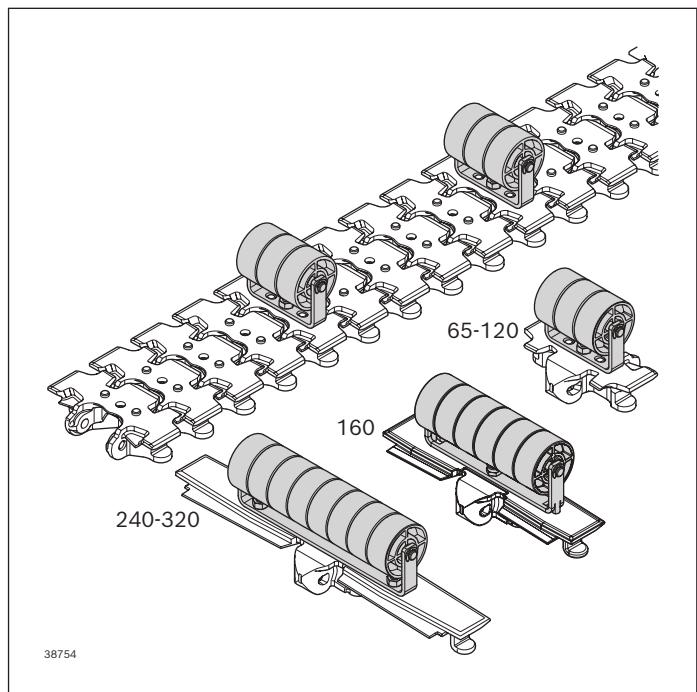
Conveyor chain; AZ = 2 ... 84	2898	1	3 842 998 720/AZ
Chain link	10	3 842 546 020	
Chain pin	100	3 842 547 727	
Pivot pin	100	3 842 547 216	



Roller cleated chain D20 **L (mm)** **No.**
VFplus 90

Conveyor chain; AZ = 2 ... 84	2898	1	3 842 998 721/AZ
Chain link	10	3 842 546 021	
Chain pin	100	3 842 547 727	
Pivot pin	100	3 842 547 216	

Roller cleat D35



The roller cleat D35 enables the transport of large-volume products on ascending or descending sections. See also "Layout instructions for roller cleated chains", page 34.

- The maximum gradient depends on the product geometry (test required)
- Accumulation operation not permitted
- Maximum chain tensile force: 1250 N
- Static force: 100 N
- Dynamic force: 10 N
- 3 types:
 - For size 65-120
 - For size 160
 - For size 240-320

Notice:

The chain plate with roller cleat must be screwed to the basic chain link.

► A D35 roller cleated chain is created easily by mounting the roller cleat on the universal chain link (65-120). Drilling the basic chain links (160-320) allows for the simple attachment of the roller cleat. A mold cavity for accommodating a flat M5 hexagon nut/screw is present, see p. 21, 40

- For feeding without any effort for cycle time adjustment
- Extremely quiet chain running thanks to the patented chain design
- Materials meet the requirements of EU 10/2011 and FDA CFR 21

Required accessories:

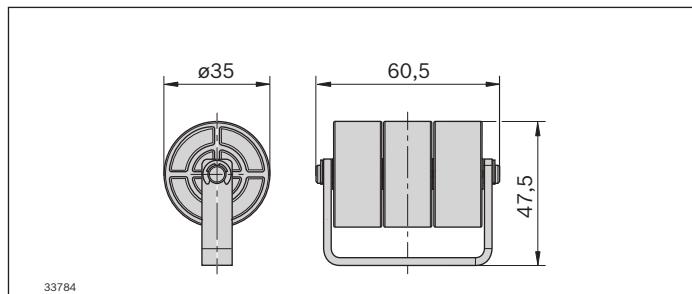
- Universal chain links 65-120, see p. 18 and p. 38, basic chain links 160-320, see p. 20

Scope of delivery:

- Roll bar mounted, incl. fastening material

Material:

- Roller: POM, white
- Roller bracket, axle: Non-rusting steel 1.4301



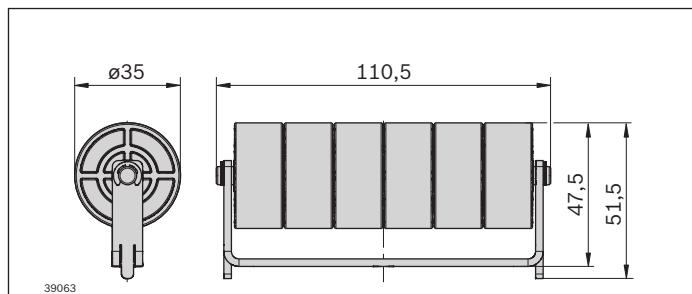
Roller cleat D35

65-120

No.

1 3 842 546 107

2

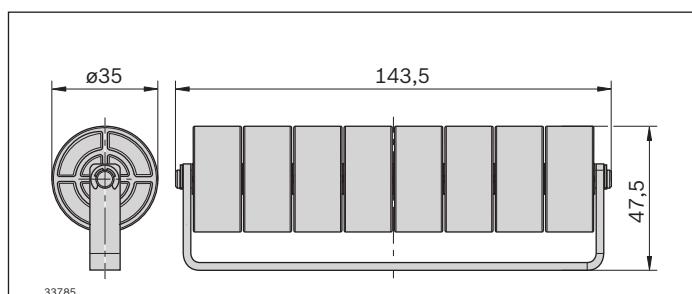


Roller cleat D35

160

No.

1 3 842 564 331



Roller cleat D35

240-320

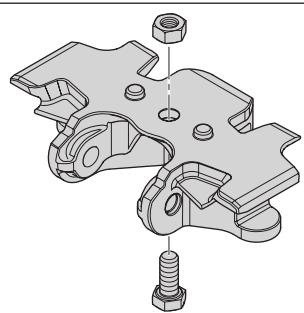
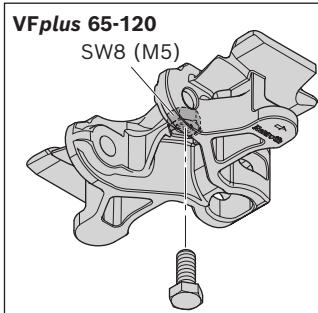
No.

1 3 842 553 028

Notice for the attachment of structures

Note VFplus 65-120:

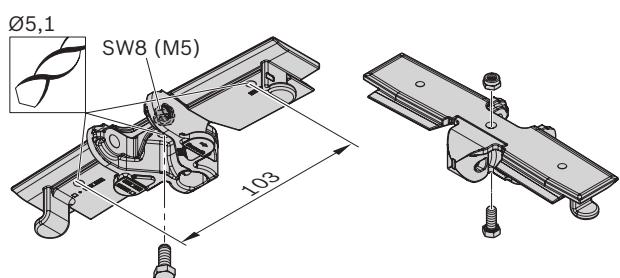
For superstructures, use the universal chain link.



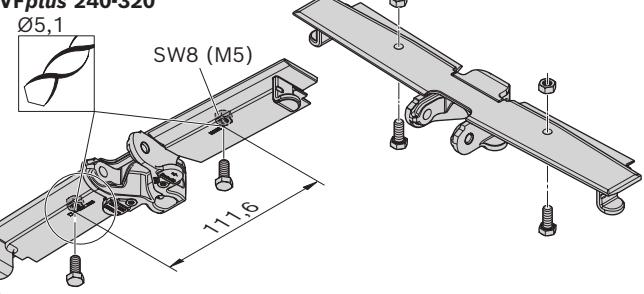
Note VFplus 160:

Roller cleat fixed with three bores

VFplus 160



VFplus 240-320



Note VFplus 240-320:

Risk of collision!

Only use the mounting points provided.

Layout instructions for roller cleated chains

Fig. A

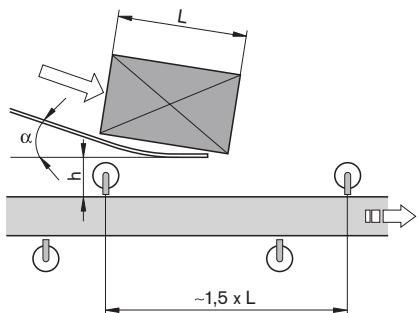
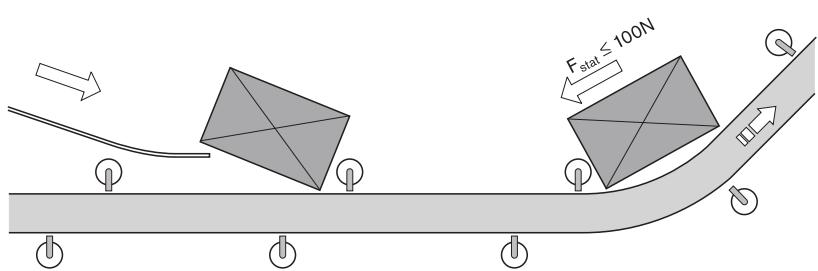
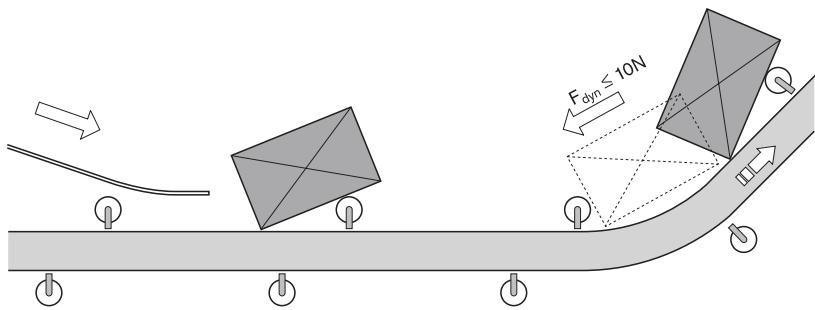


Fig. B



00123918

Fig. C



00123919

Roller cleated chain

During uphill transport of packaged, bulky products (e.g. boxes), the products can slide between the roller cleats via a chute to be diagonally "inserted" into the conveying direction from above. The product rolls into the next free pocket, which ensures continuous material flow without any expensive cycle time adjustment. The roller diameter is dependent on the size of the transported goods.

When planning, observe the following (see fig. **A**):

- Keep height of fall "h" and angle " α " as small as possible.
- The speed of the inserted product should be about the same as that of the conveyor system. Reduce higher speeds by braking (e.g. brushes) before inserting into the roller cleated chain.

Always prevent the product from transmitting its kinetic energy to the roller cleats

- Feeding in the conveying direction of the roller cleated chain
- The distance of the roller cleat is approx. 1.5x product length (ensures curve mobility in vertical curves)
- Removal speed:

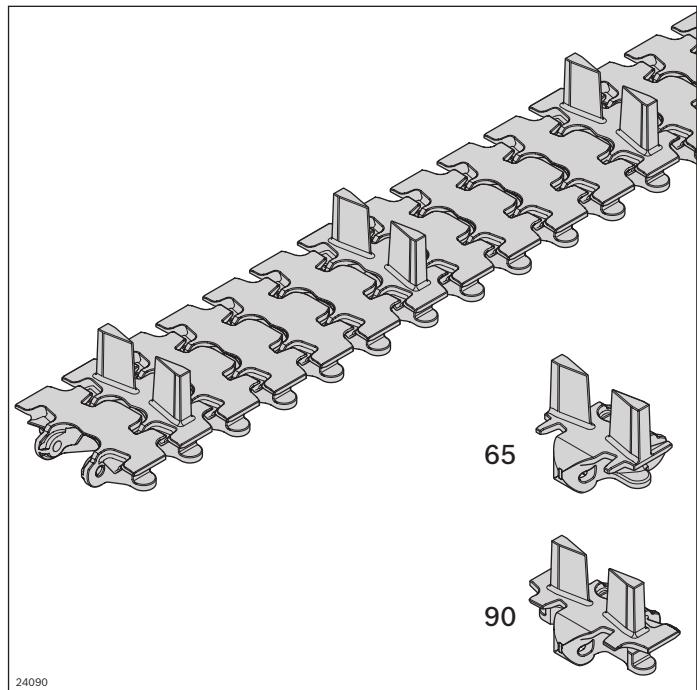
2x product length x 1.5x product quantity/min

This ensures that each product has two pockets available to slide into, either forwards or backwards (see fig. **B, C**).

- Max. dynamic force of product when sliding backwards against the roller cleat: 10 N
- Max. static force due to adjacent product: 100 N

At higher forces, decrease the angle of inclination or reduce the speed of impact by installing individual static friction chain links between the roller cleats.

Cleated chain



The cleated chain facilitates the transport of products on uphill and downhill sections.

- The maximum gradient depends on the product geometry (test required)
- Accumulation operation not permitted
- Maximum chain tensile force: 1250 N
- $AZ \geq 2$: Cleated chain supplemented with flat conveyor chain links (AZ = spacing distance)

- ▶ Extremely quiet chain running thanks to the patented chain design
- ▶ Materials meet the requirements of EU 10/2011 and FDA CFR 21

- ▶ The centrally divided cleat allows for the simple transfer of conveyed material at the section ends: A transfer area only needs to be recessed in the area of the cleat and can otherwise be used near to the submerging chain

Required accessories for individual chain links:

- Chain pin and pivot pin, see p. 37

Scope of delivery:

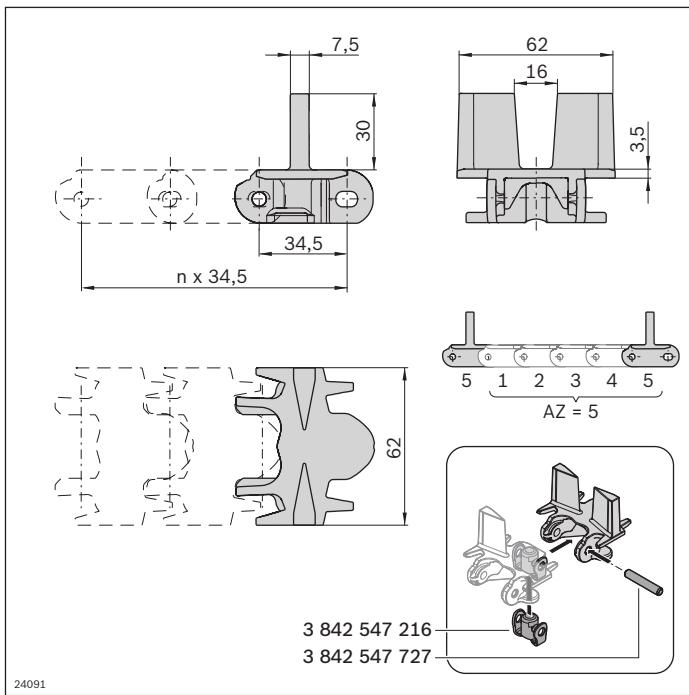
- Chain: complete, incl. chain pin and pivot pin

Material:

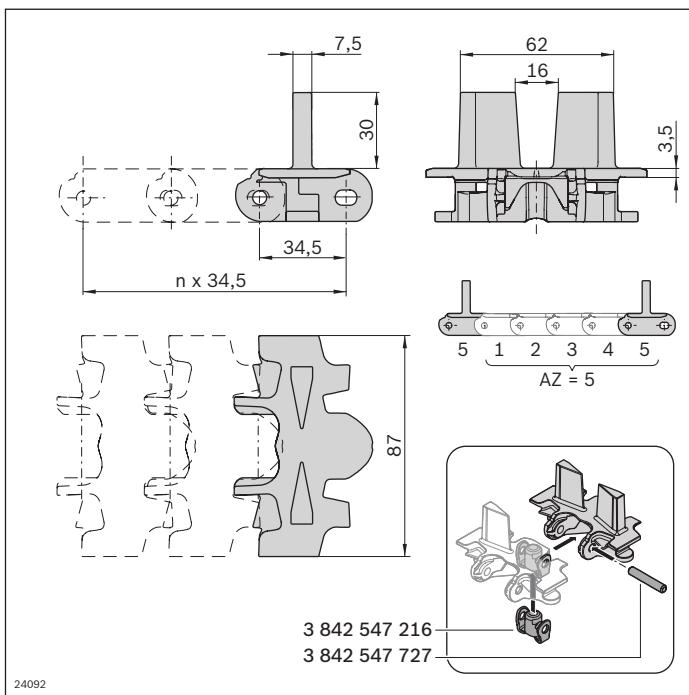
- Chain link: POM
- Chain pin: Non-rusting steel 1.4301
- Pivot pin: PA66

Condition on delivery:

- Chain: Fully assembled

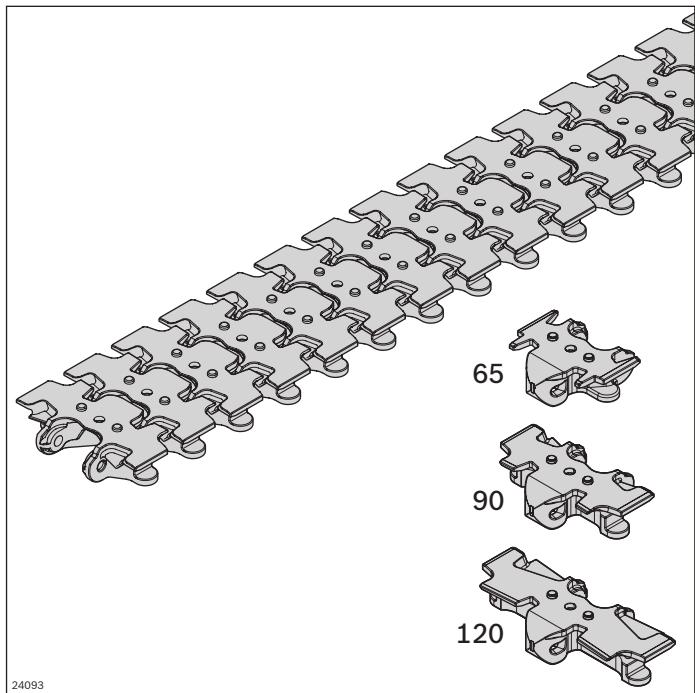
**Cleated chain VFplus 65**

	L (mm)	No.
Conveyor chain; AZ = 2 ... 84	2898	1 3 842 998 715/AZ
Chain link	10	3 842 546 015
Chain pin	100	3 842 547 727
Pivot pin	100	3 842 547 216

**Cleated chain VFplus 90**

	L (mm)	No.
Conveyor chain; AZ = 2 ... 84	2898	1 3 842 998 716/AZ
Chain link	10	3 842 546 016
Chain pin	100	3 842 547 727
Pivot pin	100	3 842 547 216

Universal chain



The universal chain serves as mounting base for the assembly of customer-specific cleats or superstructures.

- The maximum gradient depends on the customer-specific cleats (test required)
- Accumulation operation not permitted
- Maximum chain tensile force: 1250 N
- $AZ \geq 2$: Universal chain supplemented with flat conveyor chain links $AZ = 1$: complete conveyor chain with universal chain links (AZ = spacing distance)

- ▶ Extremely quiet chain running thanks to the patented chain design
- ▶ Materials meet the requirements of EU 10/2011 and FDA CFR 21

Required accessories for individual chain links:

- Chain pin and pivot pin, see p. 39

Scope of delivery:

- Chain: complete, incl. chain pin and pivot pin

Material:

- Chain link: POM
- Chain pin: Non-rusting steel 1.4301
- Pivot pin: PA66

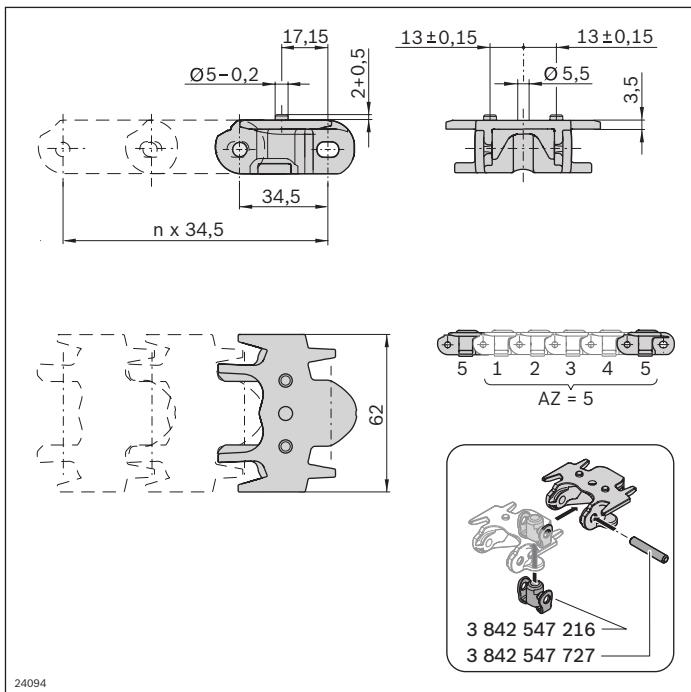
- ▶ A mold cavity for mounting a flat M5 hexagon nut on the underside of the chain plate as well as the integrated anti-torsion element (pin) facilitate the simple, centered attachment of superstructures, see p. 40

Optional accessories:

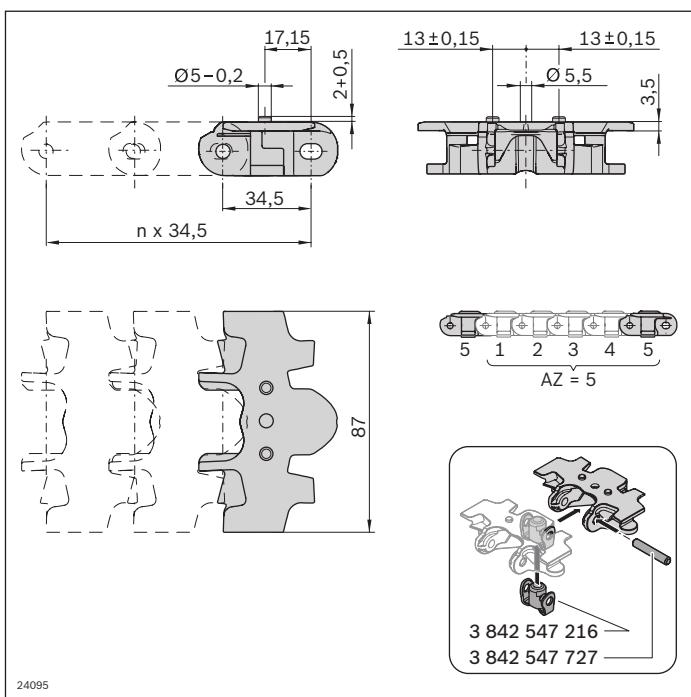
- Static friction chain link, see p. 22
- Accumulation roller chain link D11, see p. 26
- Roller cleated chain link D20, see p. 30
- Cleated chain link, see p. 36

Condition on delivery:

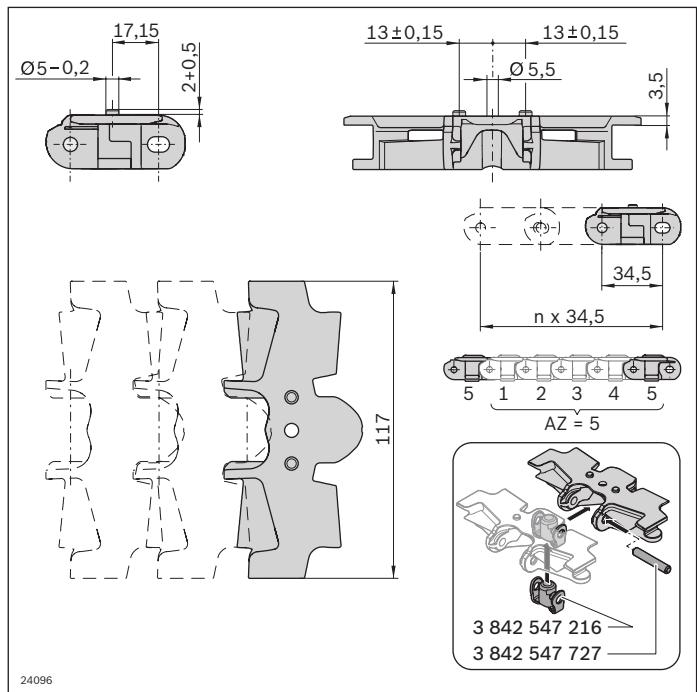
- Chain: Fully assembled



Universal chain VFplus 65	L (mm)		No.
Conveyor chain; AZ = 1 ... 84	2898	1	3 842 998 712/AZ
Chain link	10		3 842 546 012
Chain pin	100		3 842 547 727
Pivot pin	100		3 842 547 216



Universal chain VFplus 90	L (mm)		No.
Conveyor chain; AZ = 1 ... 84	2898	1	3 842 998 713/AZ
Chain link	10		3 842 546 013
Chain pin	100		3 842 547 727
Pivot pin	100		3 842 547 216

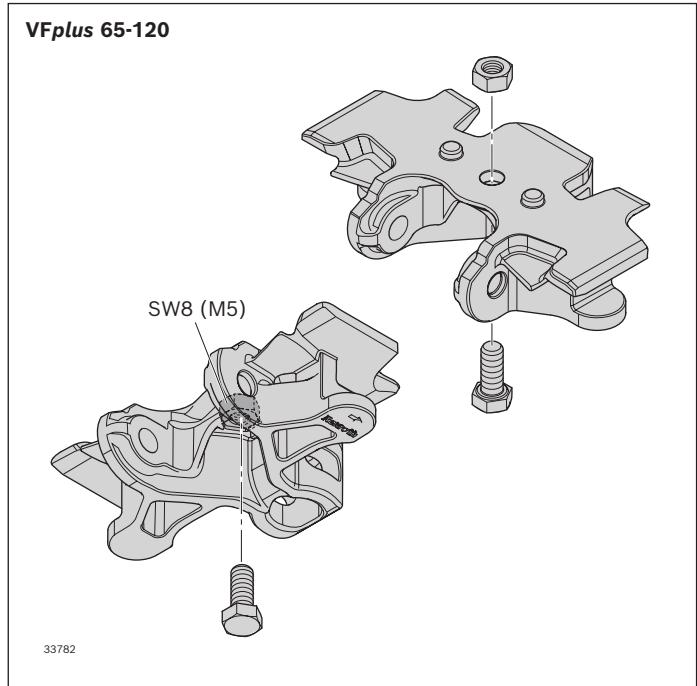


Universal chain VFplus 120	L (mm)		No.
Conveyor chain; AZ = 1 ... 84	2898	1	3 842 998 714/AZ
Chain link	10		3 842 546 014
Chain pin	100		3 842 547 727
Pivot pin	100		3 842 547 216

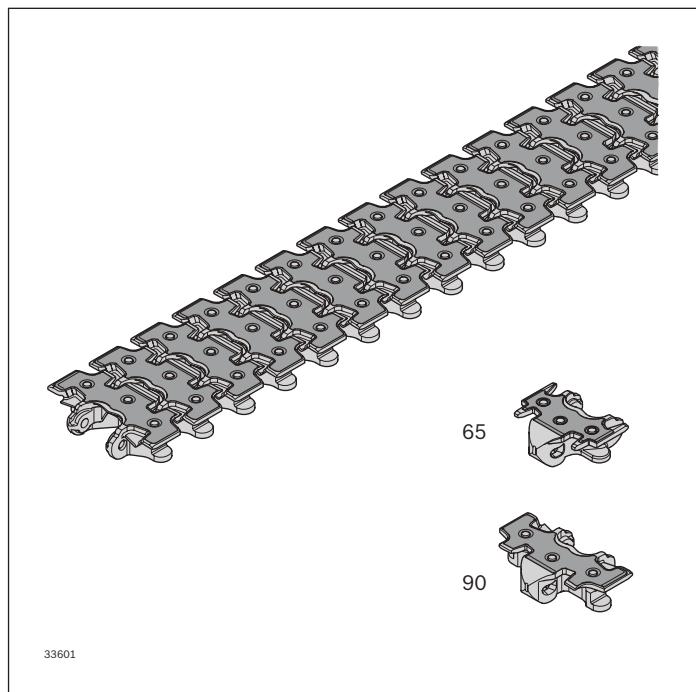
Notice for the attachment of superstructures

VFplus 65-120

Notice: For superstructures, use the universal chain link.



Steel-plated chain



The steel-plated chain is used for sharp-edged parts and products with a rough surface.

- Transport on ascending or descending sections up to about 7° possible, depending on the product (test required)
- Accumulation operation permitted, depending on the product
- Maximum chain tensile force: 1250 N
- Size: 65, 90
- Combination with chain links of different chain types is not permitted

Notice: We recommend using steel sliding rails (see p. 58), as abrasive particles cause increased wear.

Notice:

Not suitable for standard VarioFlow WT system.

- ▶ The stainless version is also suitable for use in wet ambient conditions
- ▶ This chain version offers smooth running and less maintenance (no lubrication) compared with completely steel chains

Scope of delivery:

- Chain: complete, incl. chain pin and pivot pin

Material:

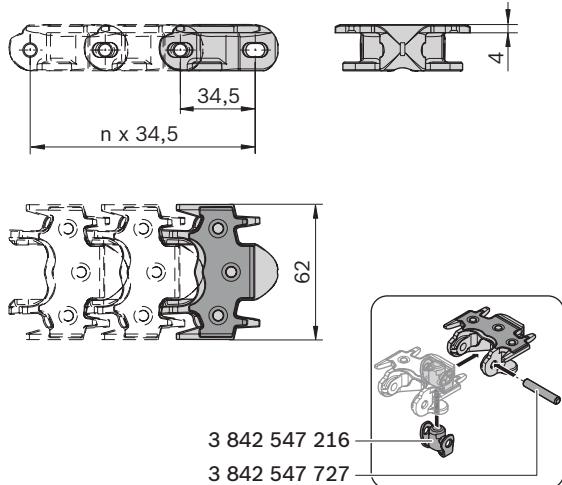
- Chain link: POM, white
- Steel coating: Non-rusting steel 1.4301, HV \geq 480
- Chain pin: Non-rusting steel 1.4301
- Pivot pin: PA66

- ▶ Extremely quiet chain running thanks to the patented chain design
- ▶ Materials meet the requirements of EU 10/2011 and FDA CFR 21

Condition on delivery:

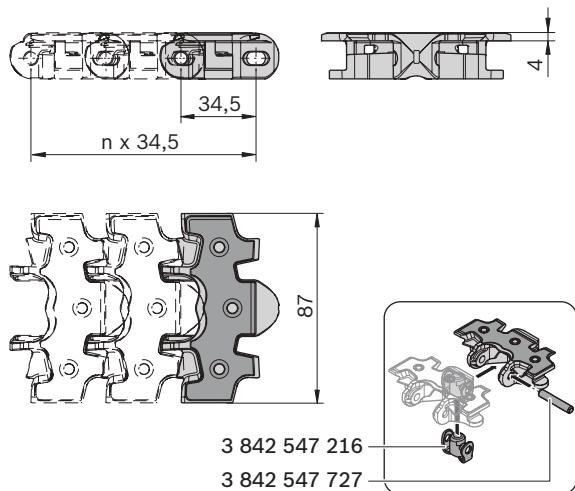
- Chain: Fully assembled

Steel-plated chain VFplus 65 L (mm)		 No.
Conveyor chain	4968	1 3 842 546 090
Chain pin	100	3 842 547 727
Pivot pin	100	3 842 547 216



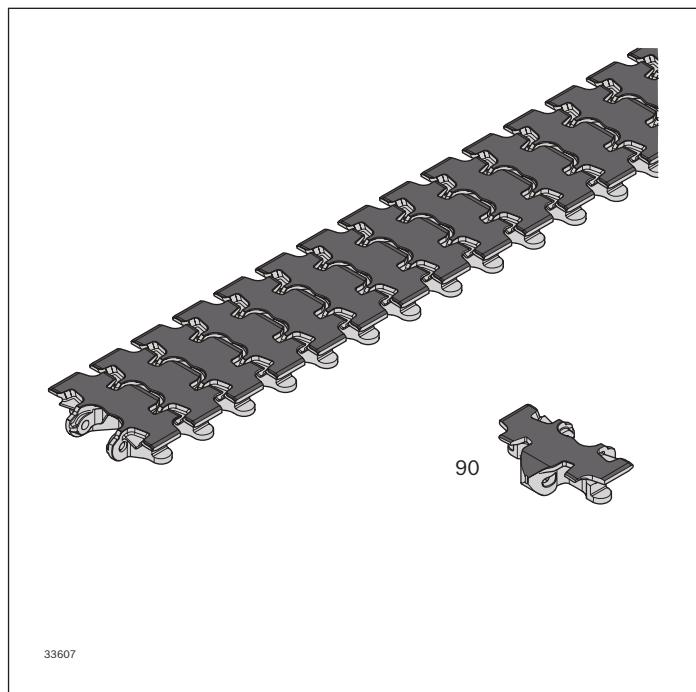
33605

Steel-plated chain VFplus 90 L (mm)		 No.
Conveyor chain	4968	1 3 842 546 091
Chain pin	100	3 842 547 727
Pivot pin	100	3 842 547 216



33606

Flocked chain



The flocked chain is used on sensitive transport surfaces (e.g. gloss, clear, barcode, raised printing).

- Transport on ascending or descending sections up to about 7° possible, depending on the product (test required)
- For products susceptible to jams
- Only dry use
- Maximum permissible tracking force: 5 N/chain link
- Maximum chain tensile force: 1250 N
- Size: 90
- Not suitable for sharp-edged products
- Combination with chain links of different chain types is not permitted

Notice:

Not suitable for standard VarioFlow *plus* WT system.

- ▶ Soft PA-flocking 3.3 dtex for sensitive product surfaces
- ▶ Extremely quiet chain running thanks to the patented chain design

Scope of delivery:

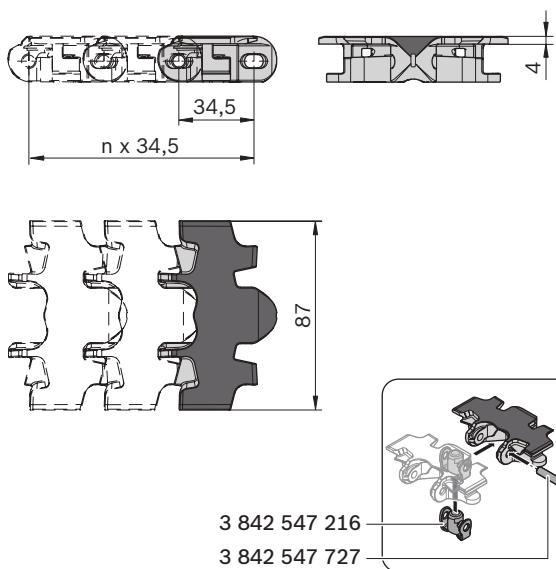
- Chain: complete, incl. chain pin and pivot pin

Material:

- Chain link: POM, white
- Flocking: PA 3.3 dtex, anthracite
- Chain pin: Non-rusting steel 1.4301
- Pivot pin: PA66

Condition on delivery:

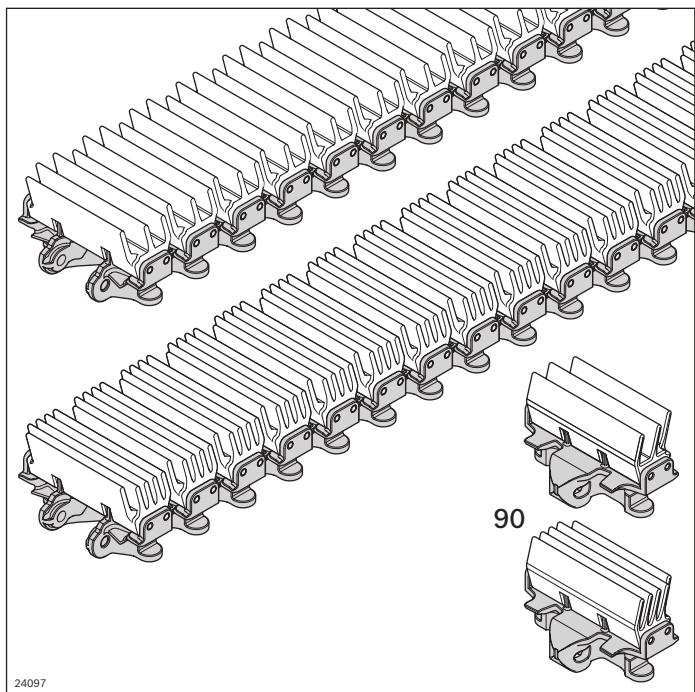
- Chain: Fully assembled



33608

Flocked chain VFplus 90	L (mm)	No.
Conveyor chain	4968	1 3 842 553 023
Chain pin	100	3 842 547 727
Pivot pin	100	3 842 547 216

Wedge chain



- ▶ Extremely quiet chain running thanks to the patented chain design
- ▶ Materials comply with the requirements of FDA CFR 21

Scope of delivery:

- Chain: complete, incl. chain pin and pivot pin

Condition on delivery:

- Chain: Fully assembled

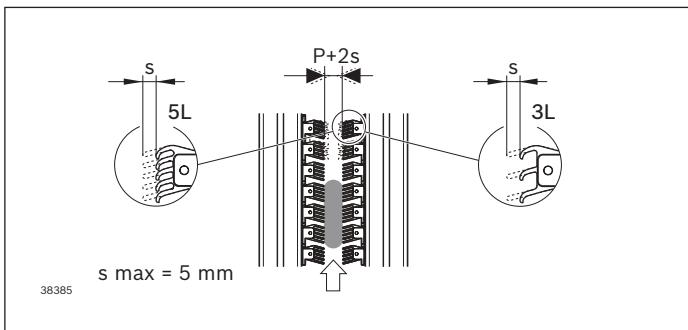
The wedge chain is used to clamp products to enable transport across different heights or distances. Particularly when the product to be transported

- Cannot be transported vertically on a standard conveyor due to its design
- Cannot be transported up steep gradients with other chains due to its center of gravity
- Has sensitive surfaces that would be damaged by lateral or upper guides
- Must not slip during vertical transport
- Should be transported without synchronization
- Transport options with the wedge chain depend on the product geometry (test required)
- Accumulation operation not permitted
- Maximum chain tensile force: 1250 N
- Only suitable for dry operation
- Chain available in 2 versions:
 - 5 plates (5L) for pressure-insensitive products
 - 3 plates (3L) for pressure-sensitive products
 Notes on contact pressure in the wedge conveyor, see page 47
- An assembly module is required for assembling and disassembling the chain
- The plates are not suitable for transporting sharp-edged objects

See also "Assembly of a wedge conveyor" on page 216.

Material:

- Chain link: POM
- Plates: TPE, Shore A 55
- Chain pin: Non-rusting steel 1.4301
- Pivot pin: PA66



Permissible product weight per chain pair:

5L: 15 N; 3L: 9 N

Max. product length (depending on the product height):

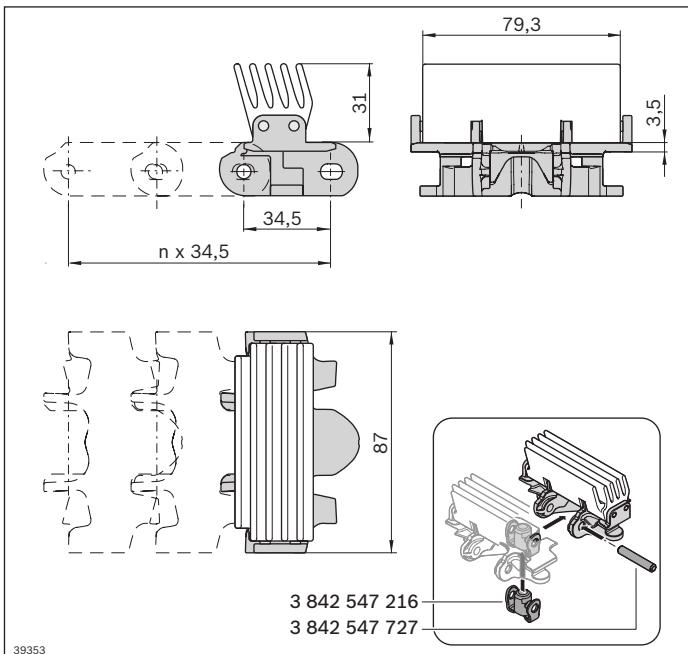
in curve wheel: 100 mm

in curve R500: 250 mm

in curve R700: 400 mm

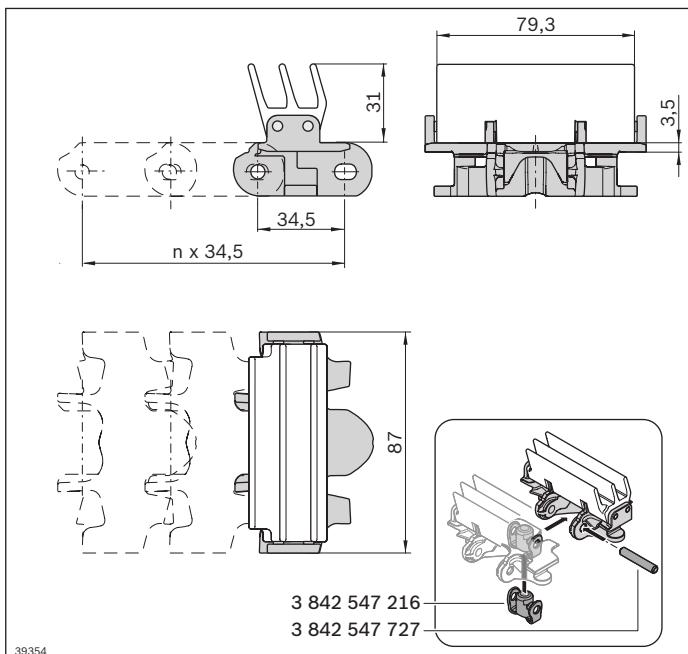
"s" (= pressing pressure) depends on size, weight, and surface finish of the product. Tests may be necessary.

P = product width



Wedge chain VFplus 90 5L L (mm) No.

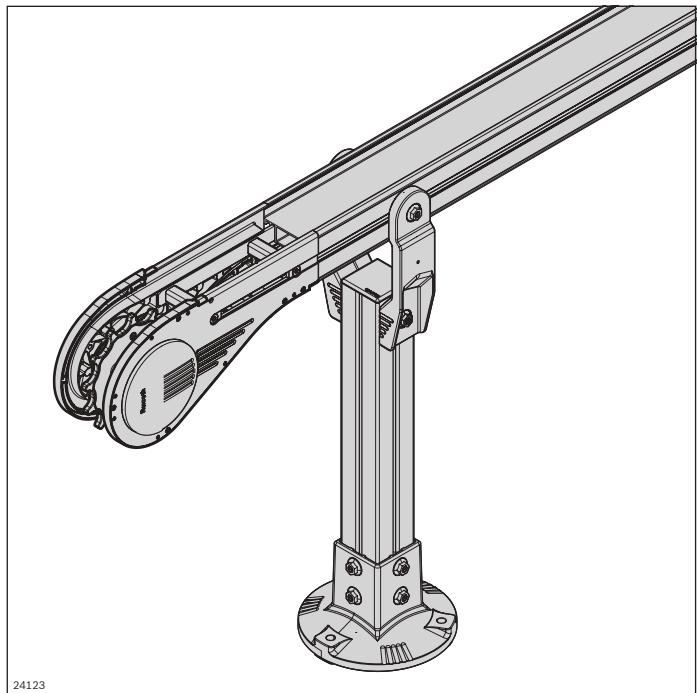
Conveyor chain	2898	1	3 842 546 086
Chain pin	100	100	3 842 547 727
Pivot pin	100	100	3 842 547 216



Wedge chain VFplus 90 3L L (mm) No.

Conveyor chain	2898	1	3 842 546 087
Chain pin	100	100	3 842 547 727
Pivot pin	100	100	3 842 547 216

VarioFlow plus Aluminum system (AL)

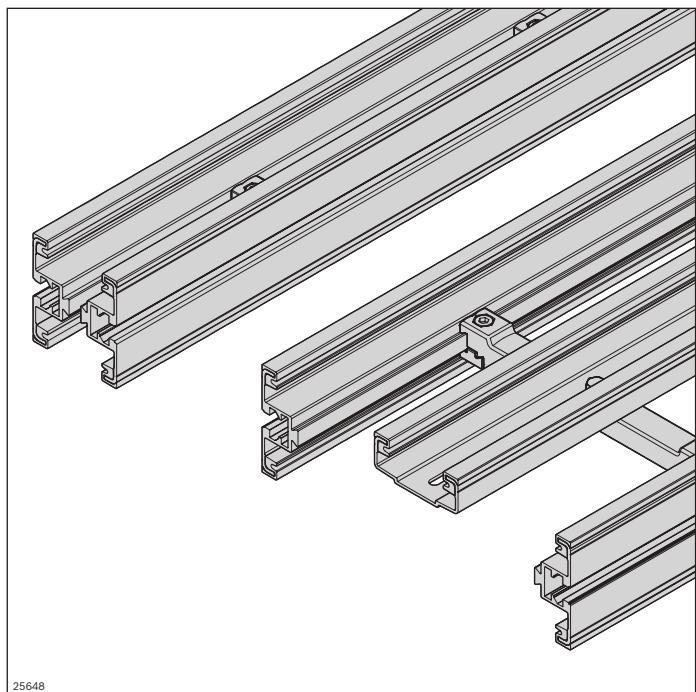


24123

- ▶ Economical conveyor layout for a wide range of applications in the automotive and electronics industries, machine linking, or in the areas of food & packaging and health & care
- ▶ Mounting of sliding rails without rivets or the need to machine the track bearing surfaces
- ▶ Minimal sliding rail interruptions
- ▶ FDA-compliant, low-friction materials for components subject to constant friction
- ▶ Standardized components that can be used universally
- ▶ Continuous product range in the sizes 65, 90, 120, 160, 240, 320

	Sections AL	50
	Curves AL	66
	Drive and return unit AL	76
	Leg sets AL and fastening elements	118

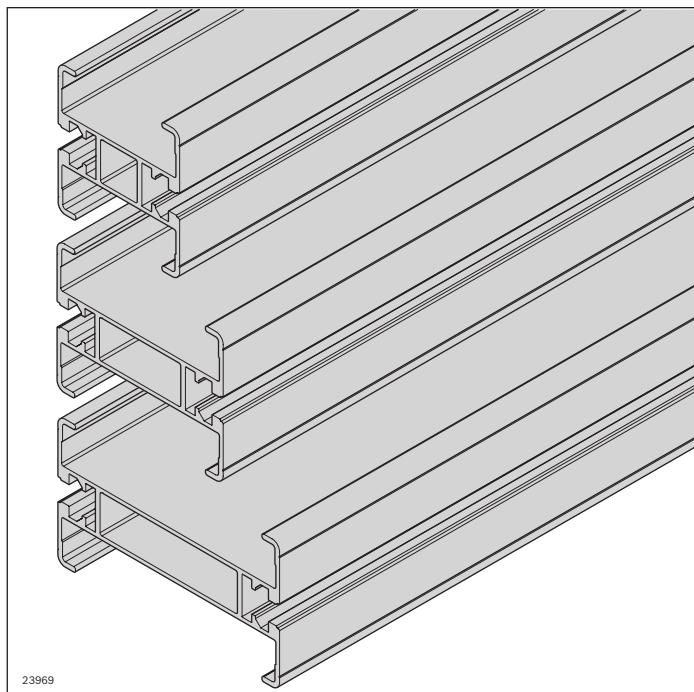
Sections AL



- ▶ Simple assembly of sections thanks to smart connection technology
- ▶ Mounting of sliding rails without rivets or the need to machine the track bearing surfaces
- ▶ Sliding rails with optimized anti-friction properties and FDA-compliant materials
- ▶ One sliding rail cross-section for all sizes
- ▶ Connection technology with plug-through screws
- ▶ Few screwed connections
- ▶ Easy to clean thanks to ample draining surfaces
- ▶ One profile cross-section for open construction in all sizes
- ▶ Closed profile in the sizes 65, 90, 120
- ▶ Use of a support profile from size 160

	Section profile AL closed	52
	Section profile AL open	54
	Sliding rail	56
	Steel sliding rail	58
	Profile connector AL	60
	Assembly module AL	62

Section profile AL closed



The section profile is the supporting element for the construction of straight conveyor sections and allows for the attachment of all required components.

- Size: 65, 90, 120

- ▶ Slot on the inside for attaching main components such as drive/return unit, curves, etc.
- ▶ Slot on the outside for fastening lateral guides, supports, or other accessories
- ▶ If necessary, the sliding rail can be mounted laterally using the centering groove as a drilling aid

Required accessories:

- Sliding rail, see p. 56
- Profile connector, see p. 60

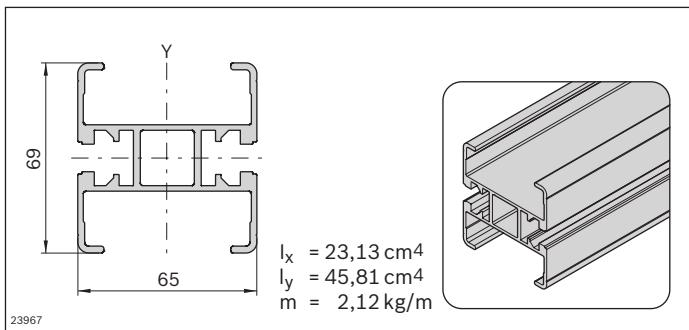
Material:

- Aluminum; natural, anodized

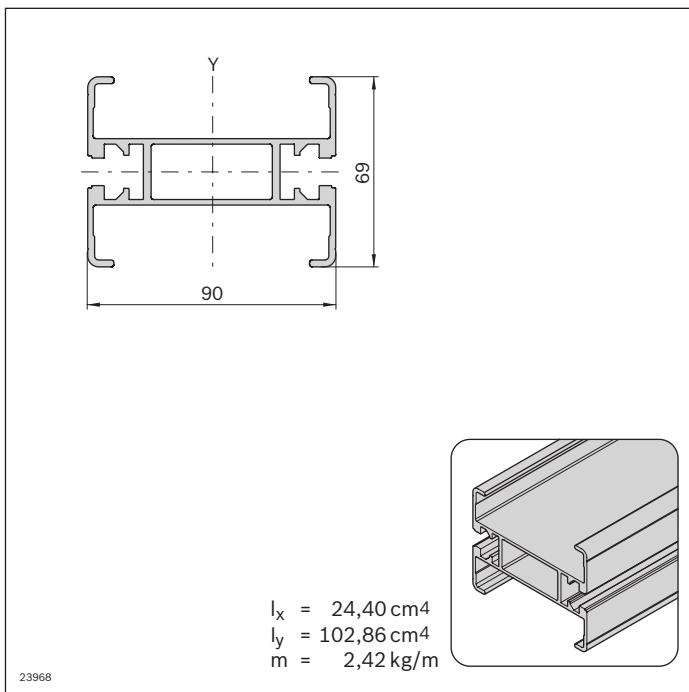
- ▶ Special constructions can be attached quickly and simply with components from the modular aluminum framing system through the 10 mm outside slot.

Optional accessories:

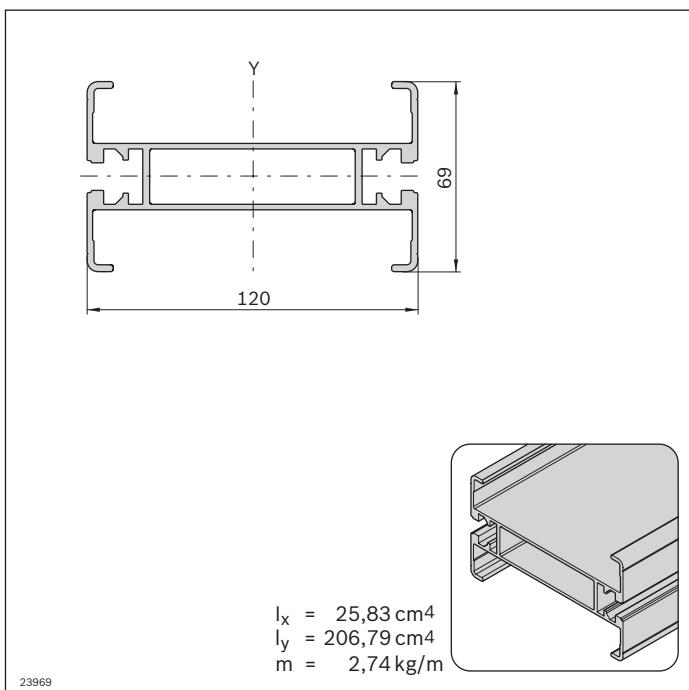
- Cover profile, see p. 63



Section profile VFplus 65 AL	L (mm)	No.
12 pcs	6070	3 842 546 643
1 pc	50 ... 6000	3 842 996 022/L



Section profile VFplus 90 AL	L (mm)	No.
12 pcs	6070	3 842 546 644
1 pc	50 ... 6000	3 842 996 023/L

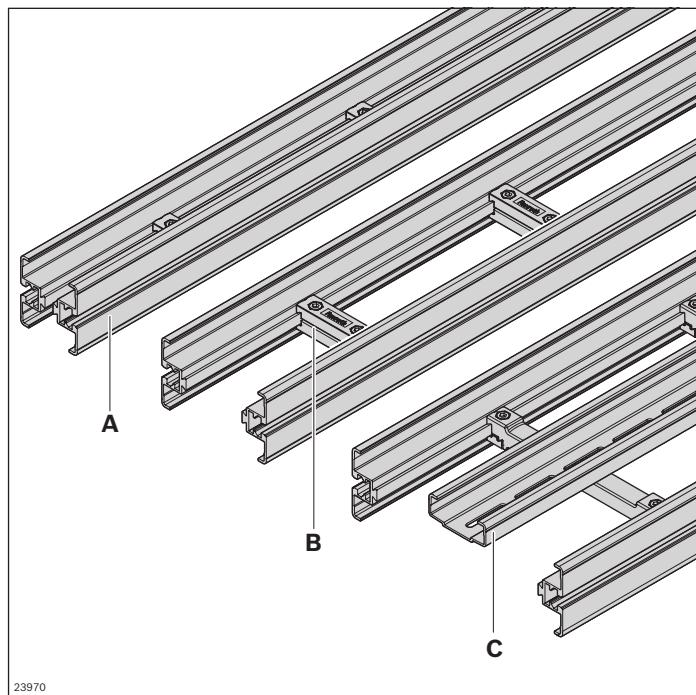


Section profile VFplus 120 AL	L (mm)	No.
6 pcs	6070	3 842 546 645
1 pc	50 ... 6000	3 842 996 024/L

Section profile AL open

Cross connector AL

Support profile AL



Section profile AL open (A)

- ▶ Slot on the inside for attaching main components such as drive/return unit, curves, etc.
- ▶ A 10 mm outside slot for simple fastening of lateral guides, leg sets, or components from the modular aluminum framing system
- ▶ If necessary, the sliding rail can be mounted laterally using the centering groove as a drilling aid

Required accessories:

- **A:** Cross connector, see p. 54; sliding rail, see p. 56; Profile connector, see p. 60; support profile from size 160, see p. 55

Optional accessories:

- **A:** Cover profile, see p. 63

The open construction of the section profile (**A**) allows dirt or foreign particles to be removed directly.

To build a conveyor section, 2 open section profiles are required, which are connected by cross connectors.

A support profile is necessary for sizes 160 and up.

- Same profile cross-section across all sizes (65-320)

The cross connector (**B**) is the connection of two profile halves to make an open section profile. The size is determined by using cross connectors of different lengths.

From size 160, a support profile (**C**) is required.

The support profile is attached to the existing cross connectors.

Cross connector AL (B)

- ▶ Cross connector with mounting option for support profile

Support profile AL (C)

- ▶ Elongated holes at regular intervals for fastening

Scope of delivery:

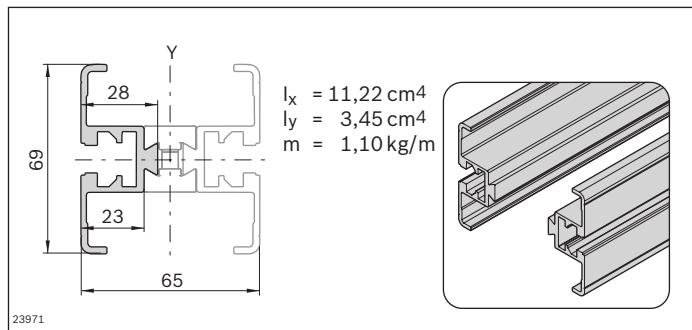
- **B:** Complete, incl. screw for attaching the support profile

Condition on delivery:

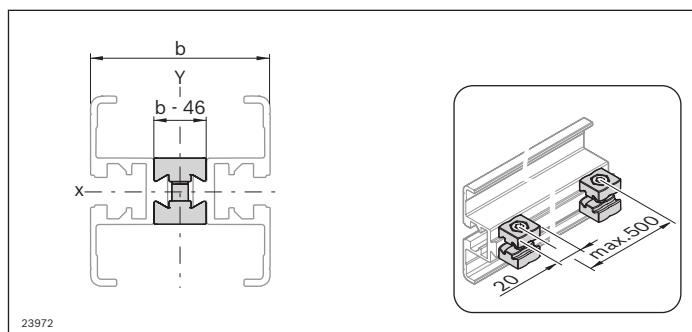
- **A, B:** Assembly required

Material:

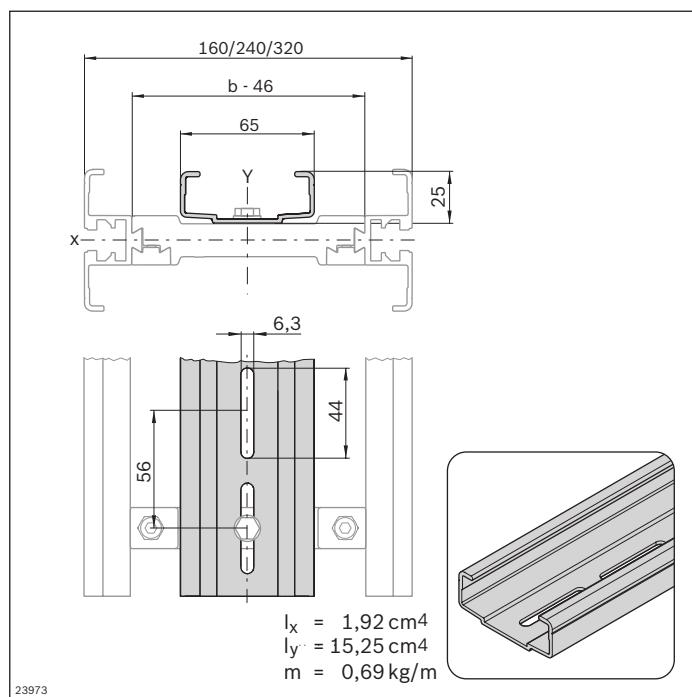
- **A, C:** Aluminum; natural, anodized
- **B:** Diecast aluminum



Section profile VFplus AL open	L (mm)	No.
12 pcs	6070	3 842 546 647
2 pcs	3000	3 842 546 670
1 pc	50 ... 6000	3 842 996 026/L

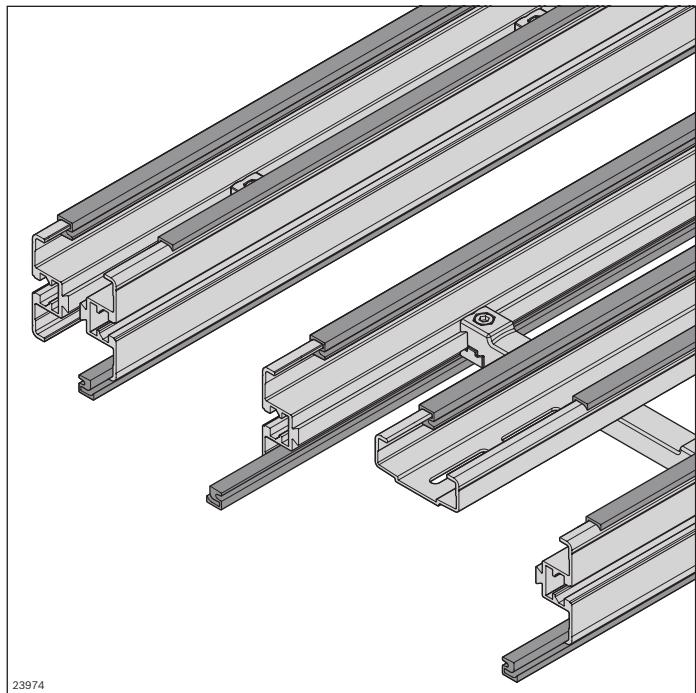


Cross connector AL	b (mm)	No.
VFplus 65	65	10 3 842 546 672
VFplus 90	90	10 3 842 546 673
VFplus 120	120	10 3 842 546 674
VFplus 160	160	10 3 842 546 675
VFplus 240	240	10 3 842 546 676
VFplus 320	320	10 3 842 546 677



Support profile VFplus AL	L (mm)	No.
12 pcs	6070	3 842 546 705
1 pc	3000	3 842 547 904
1 pc	75 ... 6000	3 842 996 028/L

Sliding rail



- ▶ Easy assembly - simply clip onto the section profile
- ▶ Secured against axial shifting with lateral screw fittings
- ▶ Gliding surface machining: not required
- ▶ Material
 - with Premium, Advanced sliding rail: FDA CFR 21
 - with Basic sliding rail: EU 10/2011, FDA CFR 21
- ▶ One cross-section for all AL and STS section profiles

Required accessories:

- Sliding rail assembly tool, see p. 300
- Sheet metal screw 2.9x9.5 DIN 7982; DIN EN ISO 7050, see p. 57
1 screw per sliding rail section

Material:

- PE-UHMW

The sliding rail is clipped into the section profile and guides the conveyor chain.

Lateral securing means the sliding surface does not need to be machined. Wear and noise level are thus reduced to a minimum.

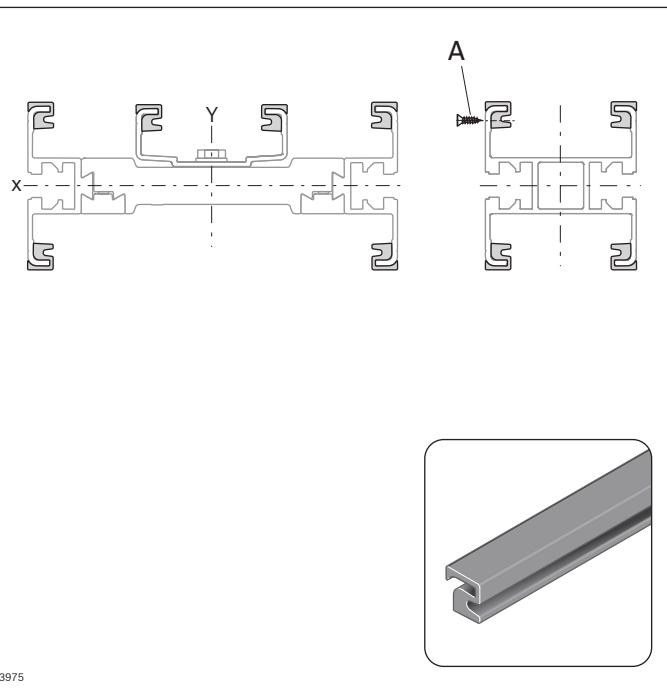
Three sliding rails with different main areas of application are available:

- Basic: straight sections and curve wheels, v_{max} 60 m/min
- Advanced: Sections with sliding curves, v_{max} 60 m/min, clean room
- Premium: Sections with sliding curves, v_{max} 120 m/min, clean room

For the selection of sliding rails, see the "Technical data" chapter on page 312. See also sliding rails ESD on page 200 and steel sliding rails on page 58.

Extend the sliding rail over the component interfaces to ensure minimum wear and noise emissions. Interruptions to the profile or component connection must be avoided. If an interruption is necessary after 10 m, the sliding rail must be attached laterally with a sheet metal screw (A).

Notice: After the sliding curves, an interruption is provided as an expansion joint in the inner curve area.



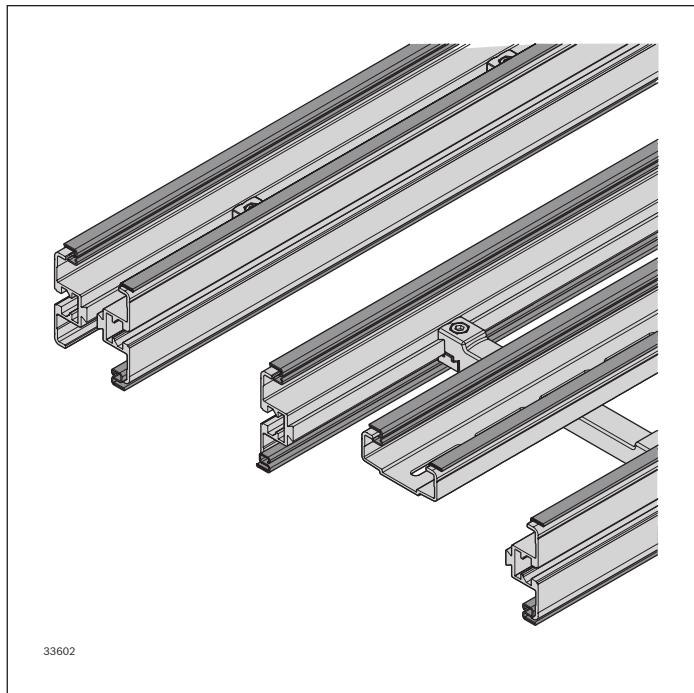
23975

Sliding rail VFplus	Color	L (mm)	 No.
Premium	gray	30000	1 3 842 546 116
Advanced	white	30000	1 3 842 549 727
Basic	blue	30000	1 3 842 549 730

See also sliding rail ESD, see p. 200 and
steel sliding rail, see p. 58.

Sheet metal screw	 No.
A	100 3 842 547 908

Steel sliding rail



- ▶ Easy assembly - simply clip onto the section profile
- ▶ Secured against axial shifting via lateral fixing
- ▶ Gliding surface machining: not required
- ▶ One cross-section for all AL and STS section profiles

Required accessories:

- Pop rivet D3x8 mm, see p. 59
- Number of rivets:
 - Straight sliding rail section: 1 rivet
 - 30°/45° curves: 2 rivets
 - 90° curve: 3 rivets
 - 180° curve: 6 rivets

Material:

- Non-rusting steel 1.4301

The steel sliding rail is suitable for use in abrasive ambient conditions (reduced service life of the conveyor chain). It is clipped in to the section profile and fixed in place at the side via a pop rivet.

The side fixing reduces the friction and the noise level to a minimum. The steel sliding rail butt joints are merely chamfered. The Advanced sliding rail is used in the lower run of the curve wheels.

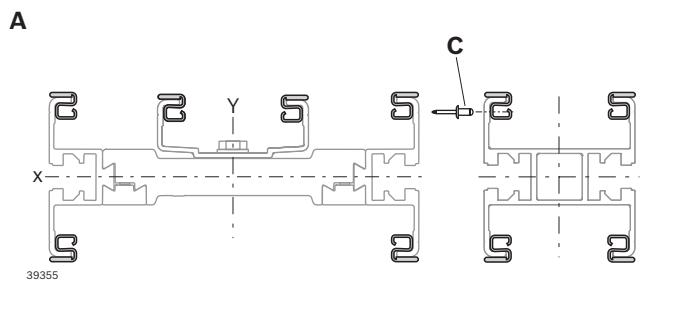
- Steel sliding rail straight section **(A)**, not bendable
- Steel sliding rail curve wheels **(B)** 30°, 45°, 90°, 180°
- Dry, wet and abrasive environment
- Size:
 - Straight section: all track widths
 - Curve wheel 65, 90, 120
- Not suitable for use in horizontal sliding curves
- Only Advanced or Premium sliding rails can be used in vertical curves

For the selection of sliding rails, see the "Technical data" chapter on page 312.

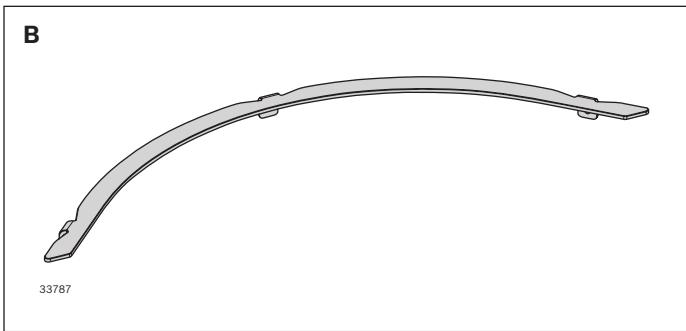
Notice: Ensure gap-free assembly (without expansion joint), as foreign bodies could otherwise get trapped in the gap and damage the chain.

Notice: Non-destructive dismantling of the steel sliding rail is not possible. A target separation point of the system must therefore be defined before assembly. Overlap the steel sliding rail by 10 ... 15 mm on the section profile separation point. This ensures that it is still possible to pull apart the two parts.

Extend the steel sliding rail over the component interfaces to ensure minimum wear and reduced noise emissions. Interruptions directly on the profile or component connection must be avoided.



Sliding rail VFplus Steel	L (mm)	No.
A Straight section	3000	1 3 842 552 970
Pop rivet D3x8mm		No.
C	100	100 3 842 557 004



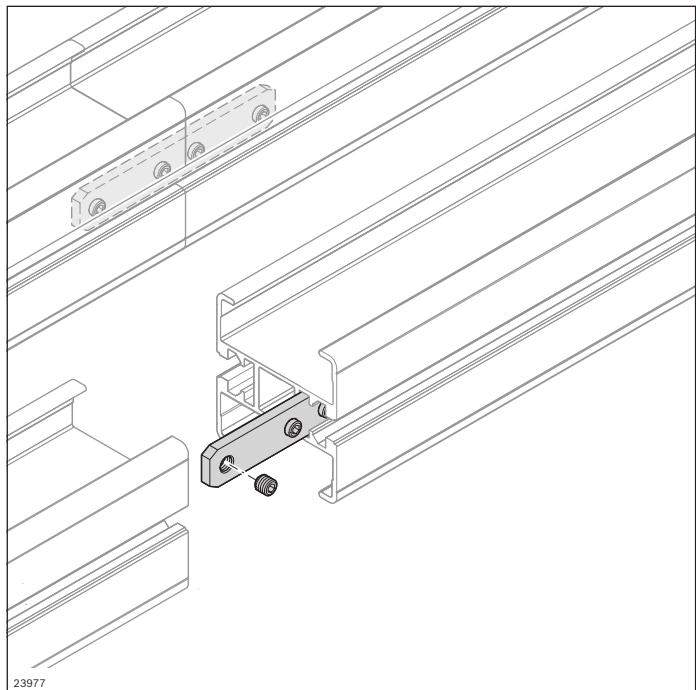
Steel sliding rail; curve wheel VFplus 65	No.
B Steel 30°	1 3 842 557 030
B Steel 45°	1 3 842 557 031
B Steel 90°	1 3 842 552 972
B Steel 180°	1 3 842 552 973

Steel sliding rail; curve wheel VFplus 90	No.
B Steel 30°	1 3 842 557 032
B Steel 45°	1 3 842 557 033
B Steel 90°	1 3 842 552 974
B Steel 180°	1 3 842 552 975

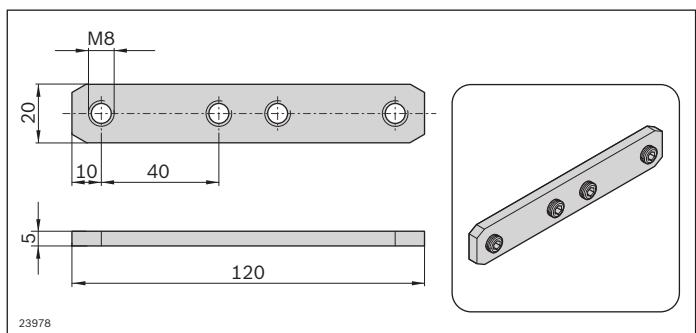
Steel sliding rail; curve wheel VFplus 120	No.
B Steel 30°	1 3 842 557 034
B Steel 45°	1 3 842 557 035
B Steel 90°	1 3 842 557 036
B Steel 180°	1 3 842 557 037

Pop rivet D3x8mm	No.
C	100 3 842 557 004

Profile connector AL



Two profile connectors are used to connect the end faces of the section profiles. The profile connector is fixed in the interior slot, so that the slot on the outside is available for all kinds of superstructures.



Profile connector VFplus AL



No.
10 3 842 530 277

Scope of delivery:

- Complete

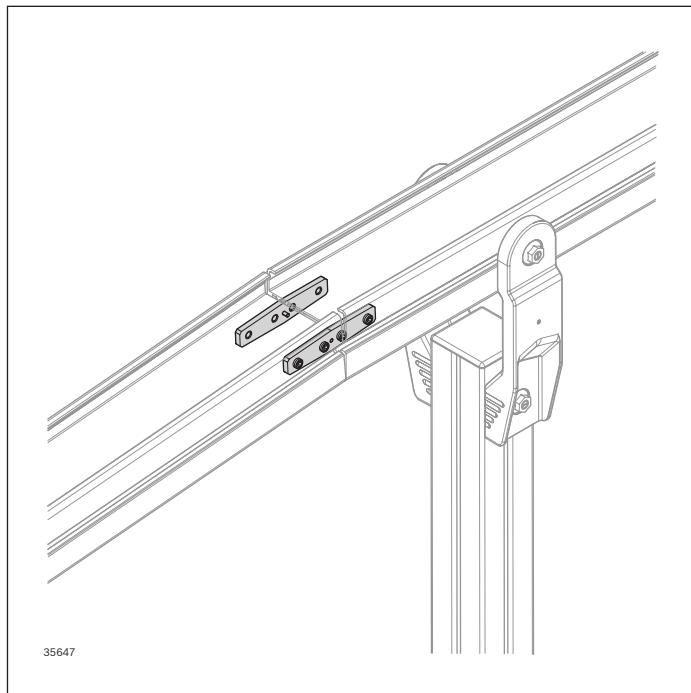
Material:

- Steel; galvanized

Condition on delivery:

- Screws pre-assembled and secured

Profile connector AL adjustable 0-5°



The adjustable profile connector is suitable for cost-effectively adjusting the vertical inclination of section profiles to an angle of 0-5°.

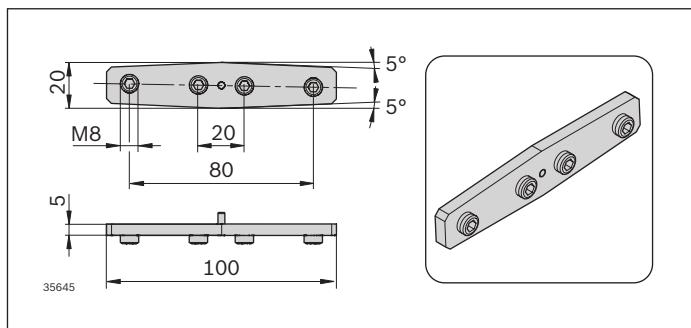
The section profiles do not require a miter cut.

For a smooth transition of the chain, only the sliding rail is pulled over the interfaces of the section profiles.

Thanks to the integrated stop, the profile connector can be fastened precisely in the central position.

The profile connector is fixed in the interior slot, so that the slot on the outside is available for all kinds of superstructures.

- Size: 65, 90, 120
- Leg distance max. 300 mm from the cut edge
- Requires the use of the "Advanced" or "Premium" sliding rails
- Only a rigid connection is permitted (not as a pivot point for height adjustment)
- Can only be connected to section profiles and horizontal sliding curves



Profile connector ADJ 0-5° SET



No.

Set 3 842 559 130

Scope of delivery:

- Complete (set contains two profile connectors)

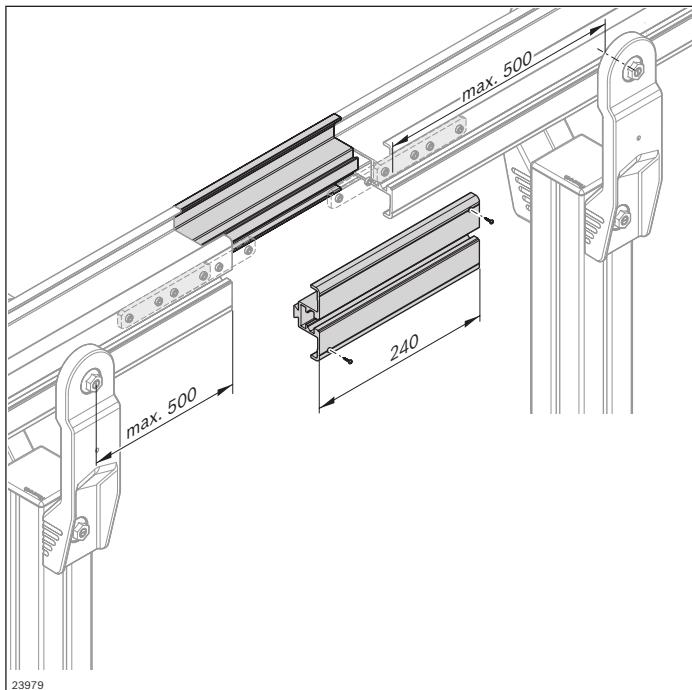
Material:

- Steel; galvanized

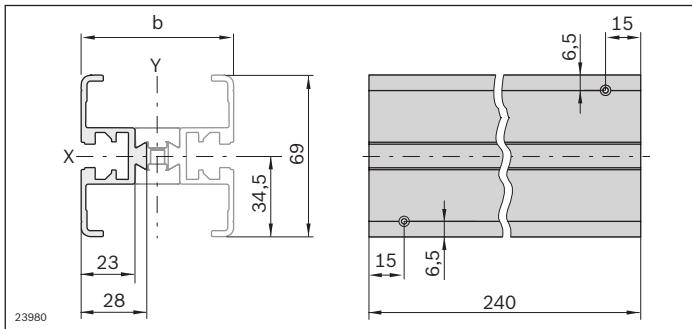
Condition on delivery:

- Screws pre-assembled and secured

Assembly module AL



23979



Required accessories:

- Sliding rail, see p. 56, 58, 200

Scope of delivery:

- Incl. 4 profile connectors and sheet-metal screws for fastening the sliding rail

Material:

- Aluminum; natural, anodized
- Profile connector: Steel; galvanized

The assembly module is used for inserting and closing or opening the chain. It can be installed at any point on the conveyor section that is easy to access in operation.

The assembly module is intended for sections with drives without a chain bag (e.g. wedge conveyor, curve wheel drive).

For attachment options, see matrix on page 329

- Max. distance from the nearest leg sets on both sides is 500 mm
- The support profile with sliding rail is not interrupted in the assembly module to increase the smooth running
- Sliding rail interruption is only required on the side to be opened

	L (mm)	No.
Assembly module VFplus AL	1	3 842 547 899
Sliding rail VFplus Premium	30000	1 3 842 546 116
Sliding rail VFplus Advanced	30000	1 3 842 549 727
Sliding rail VFplus Basic	30000	1 3 842 549 730
Sliding rail VFplus Steel	3000	1 3 842 552 970
Sliding rail VFplus ESD	30000	1 3 842 557 000

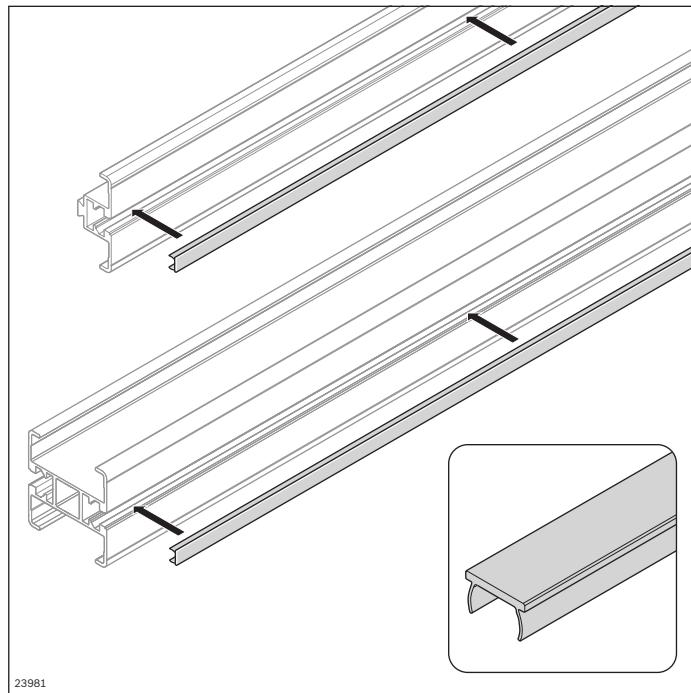
Optional accessories:

- Cover profile, see p. 63

Condition on delivery:

- In single parts

Cover profile



23981

Material:

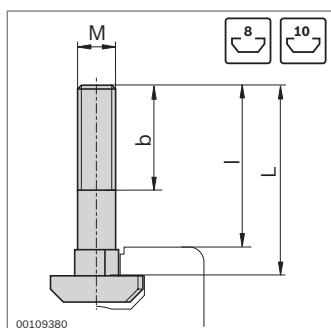
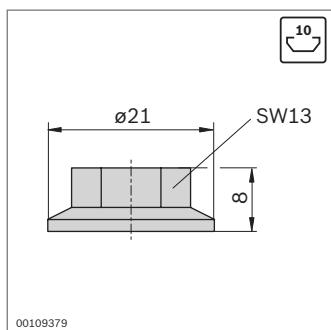
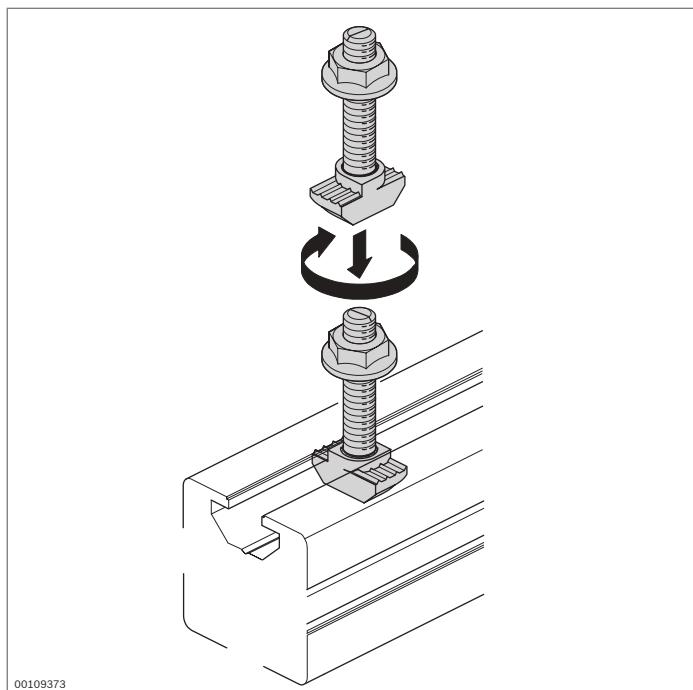
- AL: Aluminum; natural, anodized
- PVC: Hard PVC; colored

Cover profile to improve system design, to fix cables routed in the profile slot, and to protect the profile slot against contamination.

For a conductive connection of current-carrying cables, the contact washers must be mounted between the flange nuts or the washers (E) and coated accessories (holders, ...) in order to break through the coating.

Cover profile	L (mm)	W	No.
AL	2000	10	3 842 523 258
	00109368		
PVC			
19502	Signal gray (RAL 7004)	2000	10 3 842 548 876
	Black (RAL 9005)	2000	10 3 842 548 877
	Light gray (RAL 7035)	2000	10 3 842 518 367
	Red (RAL 3020)	2000	10 3 842 518 368
	Yellow (RAL 1023)	2000	10 3 842 518 369
	Green (RAL 6032)	2000	10 3 842 549 888
	Blue (RAL 5010)	2000	10 3 842 538 955
	Orange (RAL 2004)	2000	10 3 842 538 957
	Colorless, transparent	2000	10 3 842 191 182

Flange nut T-bolt



Fastening elements for mounting accessories on the profile slot

- Secure and conductive connection
- Notch at bolt end as marker for correct position recognition
- Profile finishing: Not required

There is a selection of different mounting options in the MGE catalog.

Flange nut	Slot	M	ESD	No.
	10	M8		100 3 842 345 081

Material: Steel; galvanized

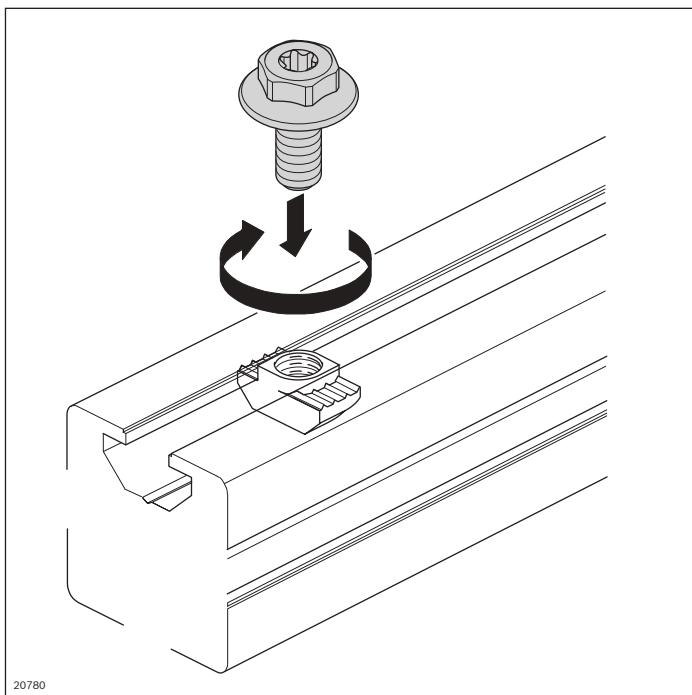
T-bolt	Slot	MxL	b (mm)	l (mm)	ESD	No.
	10	M8x20	14	14		100 3 842 528 715
		M8x25	19	19		100 3 842 528 718
		M8x30	24	24		100 3 842 528 721
		M8x40	22	34		100 3 842 528 724
		M8x50	22	44		100 3 842 528 727

Material: Steel; galvanized

Slot	
10	

¹⁾ Dependent on the profile
(see also "Technical data" in the MGE catalog)

Collar screw T-nut



- Collar screw with multi-function head for tightening with ring/open-end wrench (WS 13) or Torx screwdriver (T40)
- Machine tightening possible
- Preferably to be used for fastening brackets
- Quick and simple assembly
- Excellent force transmission via the wide flange
- With Polyfleck to secure the T-nut

Tools: Offset screwdriver

Collar screw	M	L (mm)	ESD		No.
M8x18-SW13-T40¹⁾	M8	18		100	3 842 541 246
M8x20-SW13-T40²⁾	M8	20		100	3 842 541 409

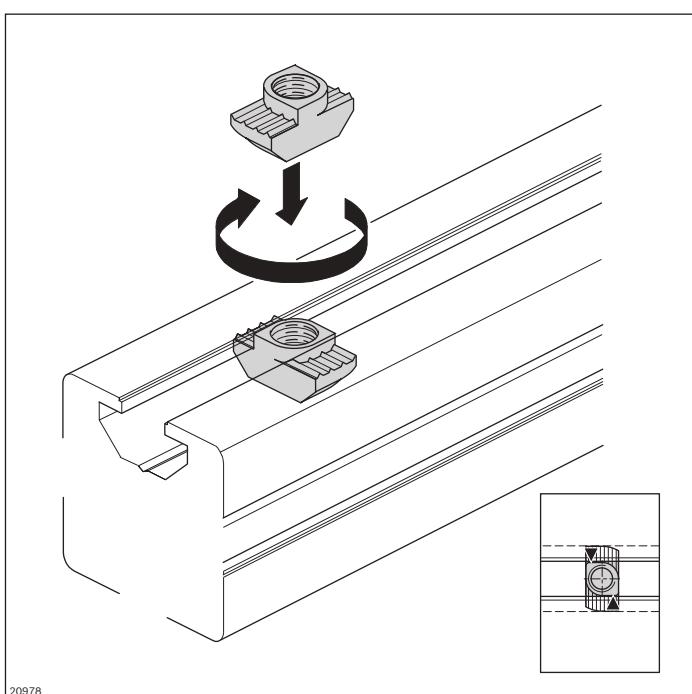
¹⁾ For 40/40 and 60/60 brackets

²⁾ For all other brackets for 10 mm slot

Material: Steel; zinc-plated

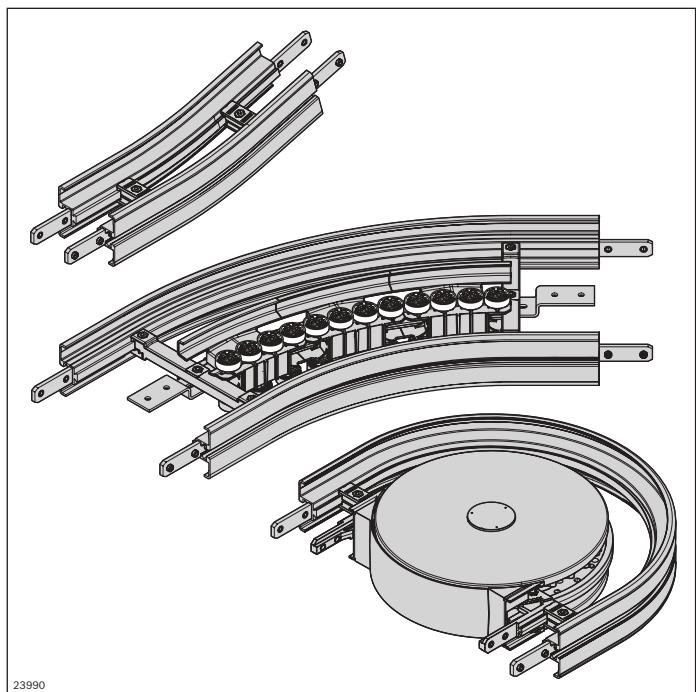
Fastening elements for mounting accessories on the profile slot

- Standard element for a secure and conductive connection
- End stop for correct positioning in the profile slot
- Profile finishing: Not required



T-nut, 10 mm slot	Slot	M	ESD		No.
Steel; zinc-plated		10	M4		100 3 842 530 281
			M5		100 3 842 530 283
			M6		100 3 842 530 285
			M8		100 3 842 530 287

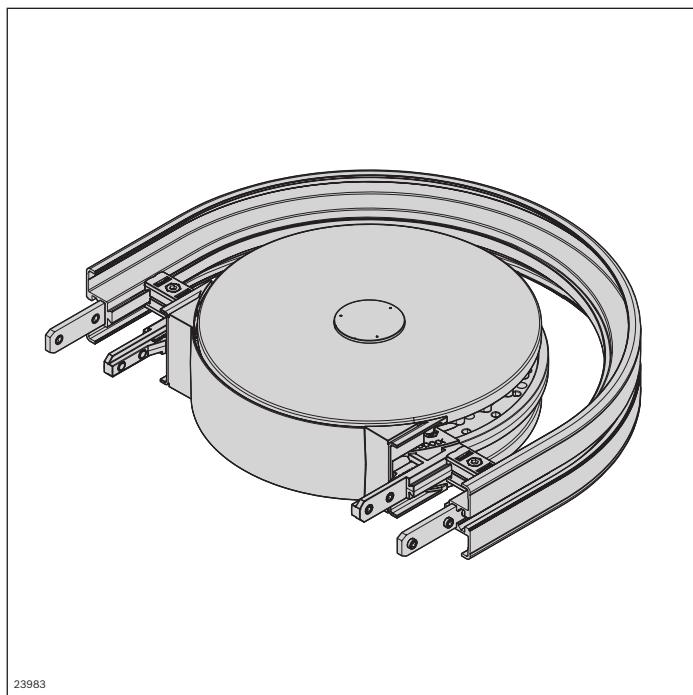
Curves AL



- ▶ Longer service life and reduced downtimes thanks to low-friction curve technology
- ▶ Reduced friction on curve wheels and patented roller curves to minimize wear, meaning longer sections
- ▶ Components subject to constant friction feature FDA-compliant materials
- ▶ Easy to clean thanks to ample draining surfaces
- ▶ Capable of accumulation
- ▶ Ball bearings sealed on both sides of non-rusting steel (1.4301) with FDA-compliant special grease in curve wheels and patented roller curves
- ▶ Curve wheel can be upgraded to a curve wheel drive or alpine conveyor

	Curve wheel AL	68
	Protective cover for the curve wheel AL	
	Roller curve horizontal AL	70
	Sliding curve horizontal AL	72
	Vertical curve AL	74

Curve wheel AL



- ▶ Ball bearing made of non-rusting steel (1.4301), with seal on both sides and FDA-compliant grease filling
- ▶ Surfaces in contact with chain made of FDA-compliant material
- ▶ No interfering contours above chain plate height
- ▶ Can be used horizontally and vertically (for wedge conveyors)

Scope of delivery:

- Incl. fastening material for mounting to the section profile AL

Material:

- Housing: Diecast aluminum
- Chain wheel: PA; white
- Ball bearing: Non-rusting steel 1.4301/FDA

The curve wheel provides a horizontal direction change for the chain. It enables low-friction direction changes with very small radii.

For attachment options, see the matrix on page 329

- Size: 65, 90, 120
- Deflection angles see table on page 69, other deflection angles on request
- Suitable chain types: all
- For circuit systems without chain return in bottom run (using a curve wheel or connection drive), the appropriate cover must be used for personal safety reasons

For the selection of sliding rails, see the "Technical data" chapter on page 312.

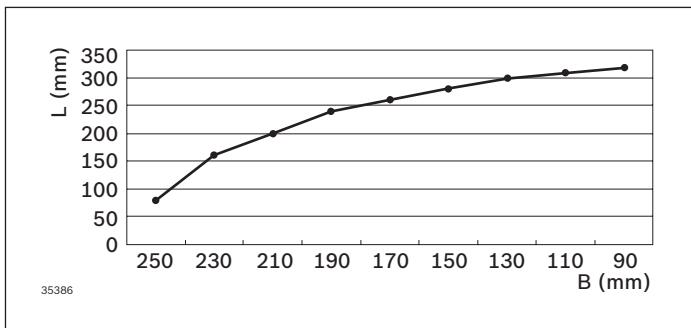
Notes:

- High-pressure cleaning of the ball bearings is not permitted
- Centering aids for mounting holes (3x DIN 798-ST4.8) of customer-specific interior lateral guides are available. The superstructures rotate with the curve wheel

See also curve wheel AL ESD, page 202.

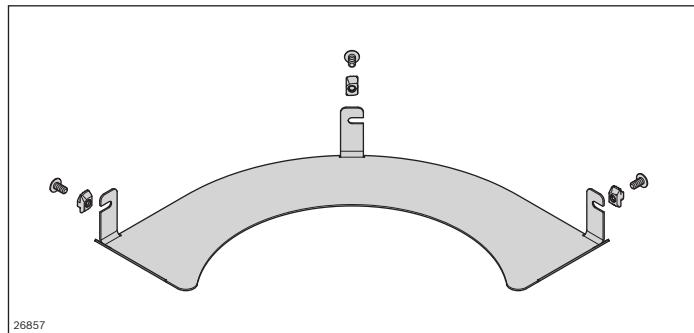
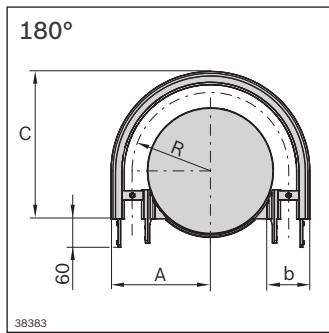
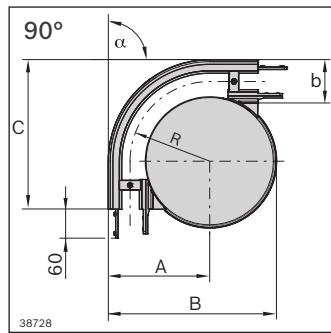
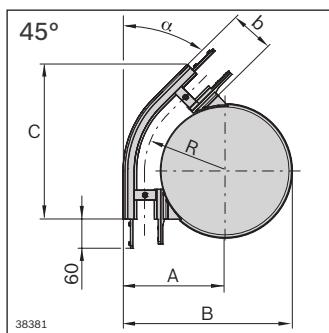
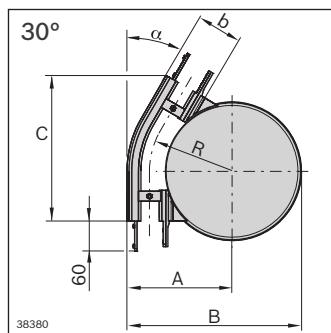
Condition on delivery:

- Assembled



L = Product length in conveying direction

B = Product width

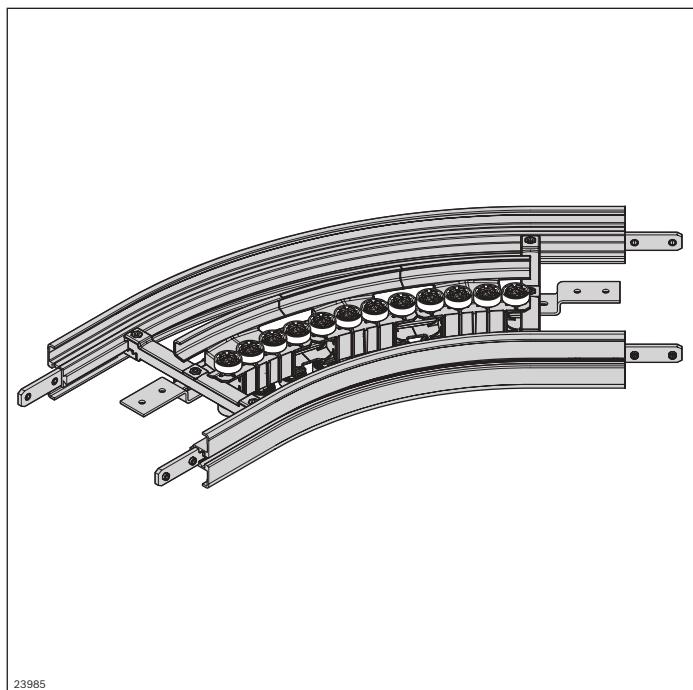


Curve wheel AL	α (°)	No.
VFplus 65	30	3 842 547 048
	45	3 842 547 049
	90	3 842 547 050
	180	3 842 547 051
VFplus 90	30	3 842 547 052
	45	3 842 547 053
	90	3 842 547 054
	180	3 842 547 055
VFplus 120	30	3 842 547 056
	45	3 842 547 057
	90	3 842 547 058
	180	3 842 547 059

b (mm)	α (°)	R (mm)	A (mm)	B (mm)	C (mm)
65	30	153.0	185.5	324.5	279.4
	45	153.0	185.5	324.5	301.9
	90	153.0	185.5	324.5	285.5
	180	153.0	185.5	–	287.5
90	30	165.5	210.5	349.5	291.9
	45	165.5	210.5	349.5	319.6
	90	165.5	210.5	349.5	310.5
	180	165.5	210.5	–	312.5
120	30	180.5	240.5	379.5	306.9
	45	180.5	240.5	379.5	340.8
	90	180.5	240.5	379.5	340.5
	180	180.5	240.5	–	342.5

Protective cover AL	α (°)	No.
VFplus 65	30	3 842 551 545
	45	3 842 551 546
	90	3 842 551 547
	180	3 842 551 548
VFplus 90	30	3 842 551 549
	45	3 842 551 550
	90	3 842 551 551
	180	3 842 551 552

Roller curve horizontal AL



The low-friction roller curve provides a horizontal change in direction for the chain. Roller elements with ball bearings enable longer conveyor sections.

The service life of the chain is increased and system costs are reduced.

For attachment options and length determination of the support profile, see matrix on page 329

- Size: 160, 240, 320
- Deflection angles, see table on p. 71
- Other deflection angles on request
- Suitable chain types: all
- Version with open section profiles

For the selection of sliding rails, see the "Technical data" chapter on page 312.

Notice: High-pressure cleaning of the ball bearings is not permitted.

- ▶ Surfaces in contact with chain made of FDA-compliant materials

- ▶ Patented roller elements for low-friction, quieter changes in chain direction
- ▶ Ball bearing made of non-rusting steel (1.4301), with seal on both sides and FDA-compliant grease filling

Required accessories:

- Sliding rail: Length calculation, see p. 314

Scope of delivery:

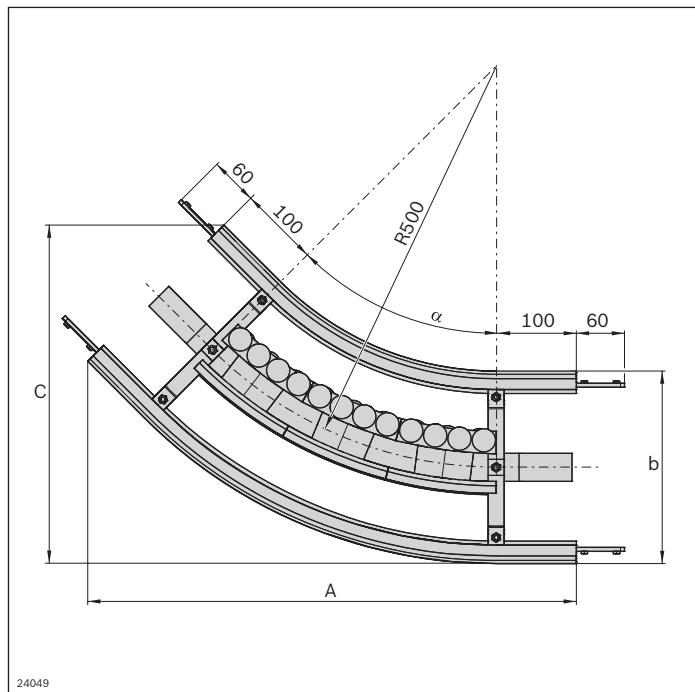
- Fastening material for mounting to the AL section profile

Material:

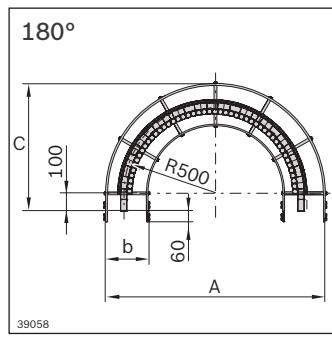
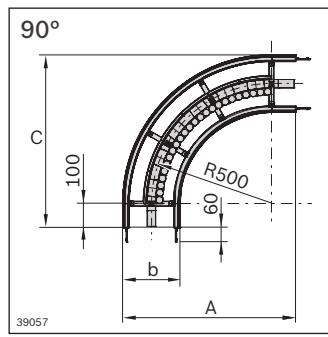
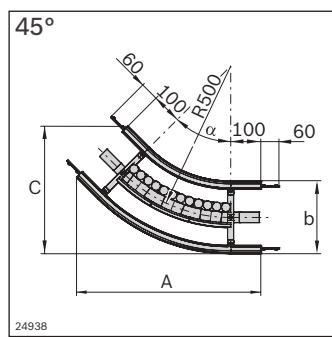
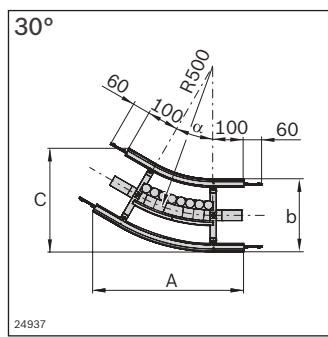
- Profile: Aluminum; anodized
- Roller carrier: PA66
- Ball bearing: Non-rusting steel 1.4301/FDA
- Connector: Steel; zinc-plated
- Rollers: PA

Condition on delivery:

- Assembled



Roller curve AL	α (°)	No.
VFplus 160	30	3 842 547 060
	45	3 842 547 061
	90	3 842 547 062
	180	3 842 547 063
VFplus 240	30	3 842 547 064
	45	3 842 547 065
	90	3 842 547 066
	180	3 842 547 067
VFplus 320	30	3 842 547 068
	45	3 842 547 069
	90	3 842 547 070
	180	3 842 547 071



b (mm)	α (°)	A (mm)	C (mm)
160	30	476.6	266.3
	45	580.8	353.7
	90	680.0	680.0
	180	1160.0	680.0
240	30	496.6	340.9
	45	609.1	422.0
	90	720.0	720.0
	180	1240.0	720.0
320	30	516.6	415.6
	45	637.4	490.3
	90	760.0	760.0
	180	1320.0	760.0

Sliding curve horizontal AL



The sliding curve provides a horizontal change in direction for the chain, for when there is not enough space for a curve wheel or the speeds or product dimensions do not permit conveying over a curve wheel. The sliding curve is used to reduce noise at high speeds or when transporting long products in wedge conveyors. The chain tensile force is increased through the ensuing friction.

For attachment options, see the matrix on page 329

- Size: 65, 90, 120
- Deflection angles and radii see table on p. 73, other deflection angles and radii on request
- Suitable chain types: all
- Version with open section profiles
- Requires the use of the "Advanced" or "Premium" sliding rails
- Use in abrasive environments is not permissible

For the selection of sliding rails, see the "Technical data" chapter on page 312.

Required accessories:

- Sliding rail: Length calculation, see p. 314

Scope of delivery:

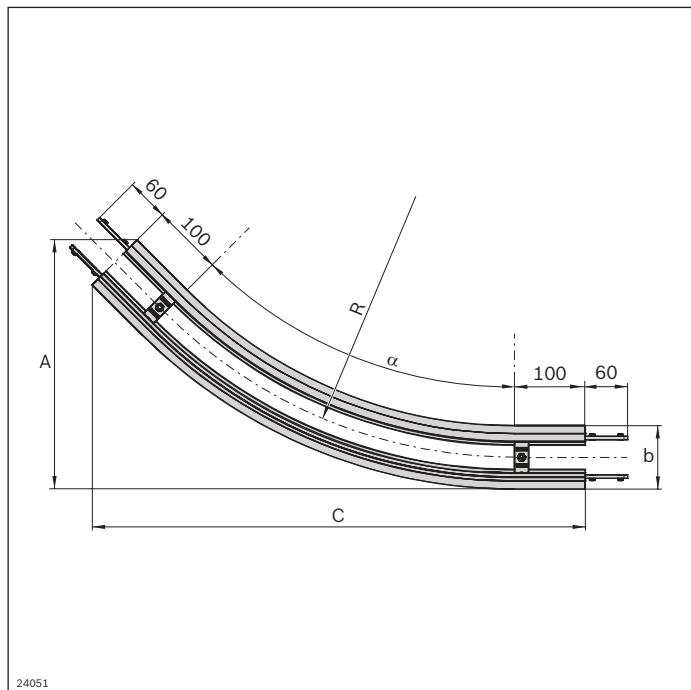
- Incl. fastening material for mounting to the section profile AL

Material:

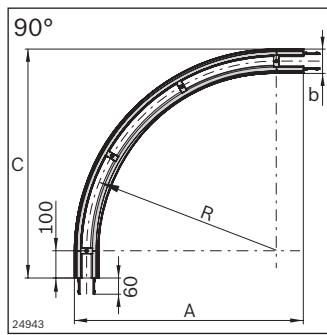
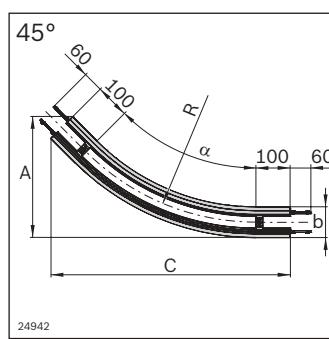
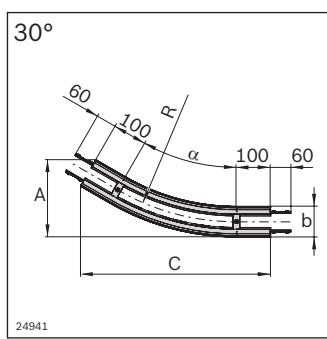
- Profile: Aluminum; anodized
- Profile connector: Steel; zinc-plated
- Cross connector: Diecast aluminum

Condition on delivery:

- Assembled

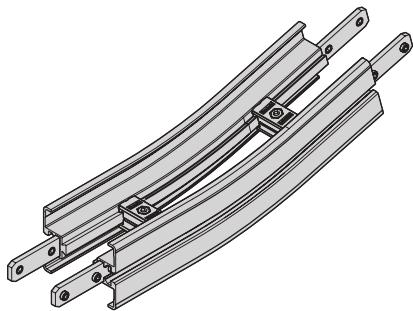


Sliding curve horizontal AL	α (°)	R (mm)	No.
VFplus 65	30	700	3 842 547 072
	45	700	3 842 547 073
	90	700	3 842 547 074
VFplus 90	45	500	3 842 547 075
	90	500	3 842 547 076
	30	700	3 842 547 077
VFplus 120	45	700	3 842 547 078
	90	700	3 842 547 079
	30	700	3 842 547 080
VFplus 120	45	700	3 842 547 081
	90	700	3 842 547 082



b (mm)	α (°)	R (mm)	A (mm)	C (mm)
65	30	700	204.4	552.9
	45	700	331.2	688.7
	90	700	832.5	832.5
90	45	500	294.0	556.1
	90	500	645.0	645.0
	30	700	227.8	559.1
120	45	700	352.6	697.5
	90	700	845.0	845.0
	30	700	255.7	566.6
120	45	700	378.2	708.1
	90	700	860.0	860.0

Vertical curve AL



24052

The vertical curve is used for the transition from a horizontal conveyor section to an ascending section and vice versa. The chain tensile force is increased through the ensuing friction.

A vertical curve of 5° is recommended for the infeed and outfeed on the wedge conveyor, especially with small products.

For attachment options, see the matrix on page 329

- Size: all track widths
- Deflection angles and radii see table on page 75, other deflection angles and radii on request
- Suitable chain types: all
- Version with open section profiles
- Requires the use of the "Advanced" or "Premium" sliding rails
- For vertical sections $\leq 5^\circ$, the adjustable AL profile connectors can be used for sizes 65-120

For the selection of sliding rails, see the "Technical data" chapter on page 312.

Required accessories:

- Sliding rail: Length calculation, see p. 314

Scope of delivery:

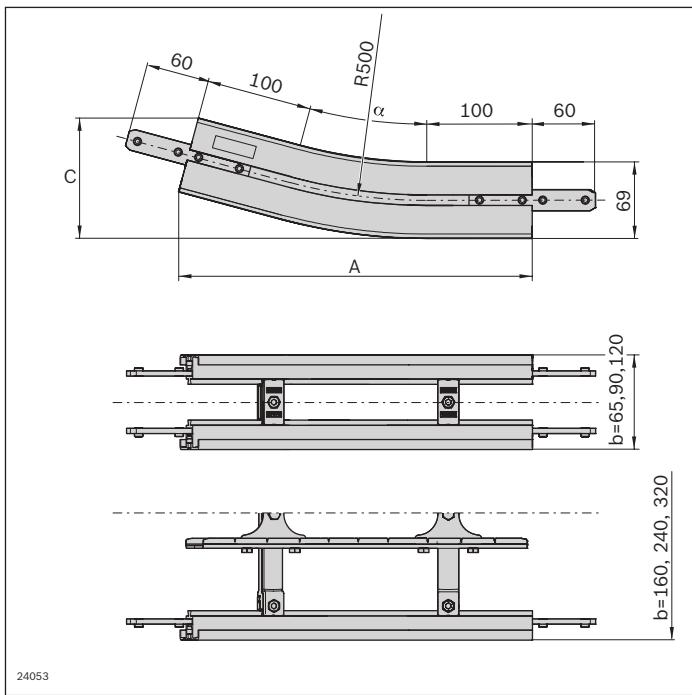
- Incl. fastening material for mounting to the section profile AL

Material:

- Profile: Aluminum; anodized
- Profile connector: Steel; zinc-plated
- Cross connector: Diecast aluminum
- Support profile from size 160: Non-rusting steel 1.4301

Condition on delivery:

- Assembled

**Vertical curve AL**

VFplus 65

α (°)	No.
5	3 842 547 083
7.5	3 842 547 084
15	3 842 547 085
30	3 842 547 086
45	3 842 547 087
90	3 842 559 126

VFplus 90

5	3 842 547 088
7.5	3 842 547 089
15	3 842 547 090
30	3 842 547 091
45	3 842 547 092
90	3 842 559 127

VFplus 120

5	3 842 547 093
7.5	3 842 547 094
15	3 842 547 095
30	3 842 547 096
45	3 842 547 097
90	3 842 559 128

VFplus 160

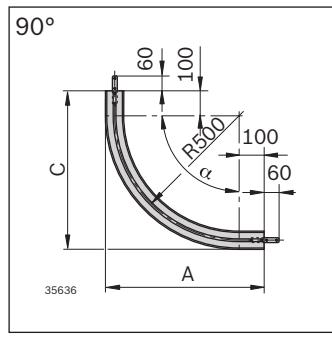
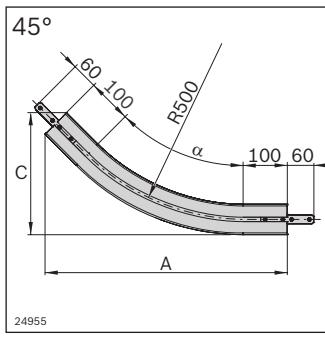
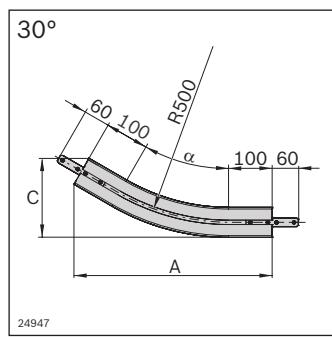
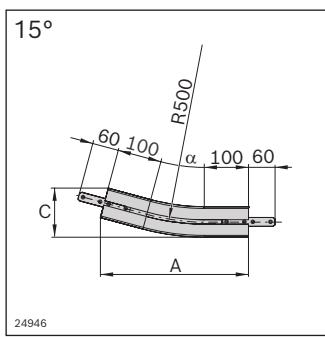
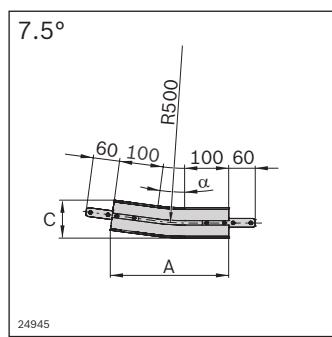
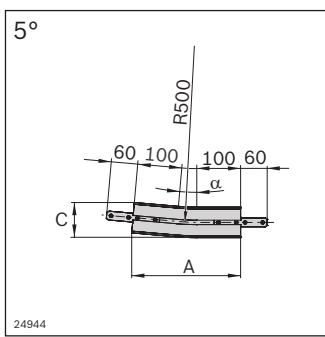
5	3 842 547 098
7.5	3 842 547 099
15	3 842 547 100
30	3 842 547 101
45	3 842 547 102

VFplus 240

5	3 842 547 103
7.5	3 842 547 104
15	3 842 547 105
30	3 842 547 106

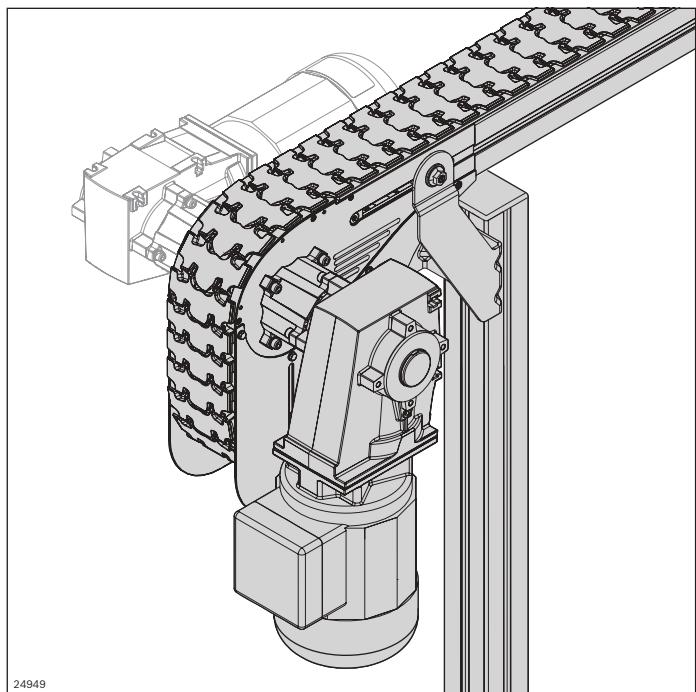
VFplus 320

5	3 842 547 107
7.5	3 842 547 108
15	3 842 547 109
30	3 842 547 110



b (mm)	α (°)	R (mm)	A (mm)	C (mm)
65-320	5	500	246.2	79.5
	7.5	500	268.9	86
	15	500	334.9	110.7
	30	500	453.9	181.4
65-160	45	500	548.7	276.1
65-120	90	500	636.3	636.3

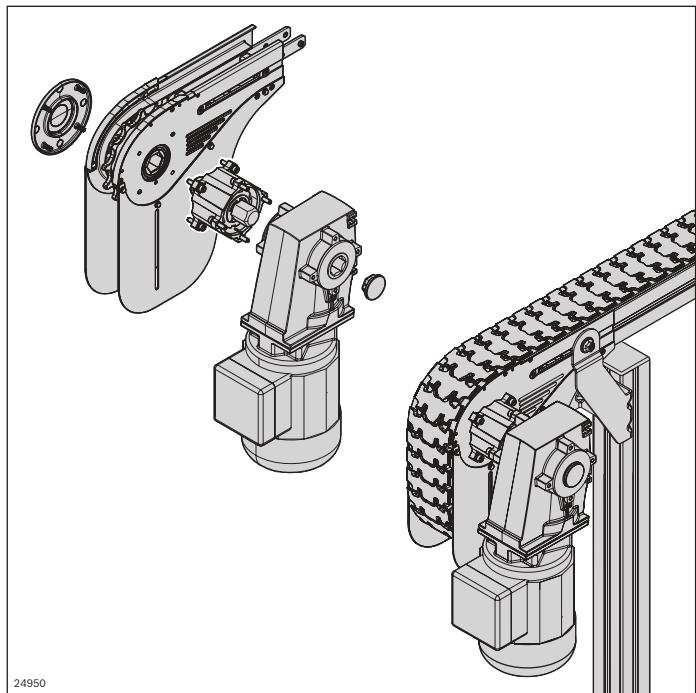
Drive and return unit AL



- ▶ High flexibility and short delivery times thanks to a novel drive concept
- ▶ Basic units with interfaces on both sides for drive kit and transmission (active bridges)
- ▶ Free choice of the motor mounting position on site
- ▶ Configurable drive kit (standard gear motor or round shaft)
- ▶ Multi-track systems with standard components possible
- ▶ Reduced noise emission due to sliding rails guided in the drive/return unit
- ▶ In-stock, standardized components
- ▶ Side elements with slots for accommodating holders
- ▶ Pulling section; pushing or reversible operation on request

	Basic unit AL head drive direct	80
	Basic unit AL connection drive	82
	Basic unit center drive	84
	Return unit AL Closed head drive AL	86
	90° return unit	88
	Basic unit Curve wheel drive AL	90
	Drive kit	92
	Drive kit curve wheel AL	95
	Frequency converter motec 8400	98
	Manual control unit	101
	Transmission kit	102
	Passive/active bridge connection kit	104
	Connection kit Synchronous drive, external motor/internal motor	114
	Alpine conveyor connection kit	116

Innovative drive concept



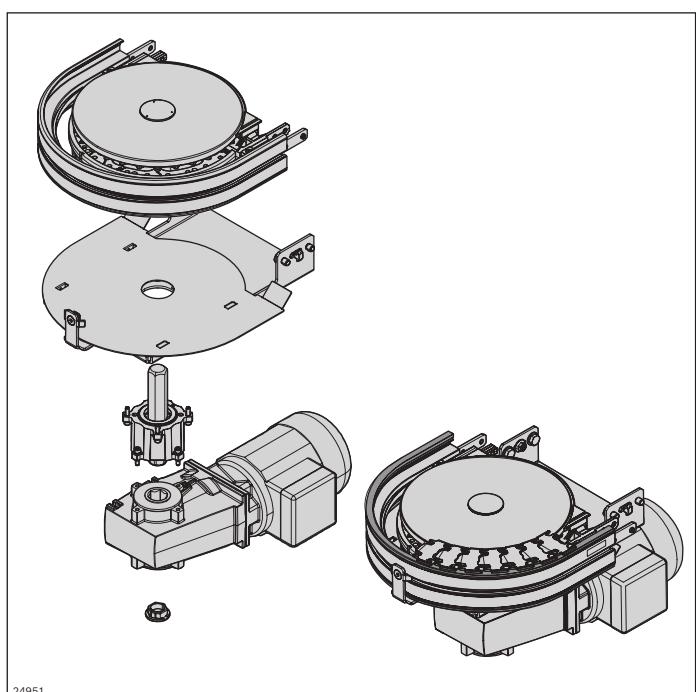
Basic unit AL
(head drive direct, center or
connection drive)
or return unit

+

Configurable drive kit
(standard gear motor or round shaft +
transmission kit where applicable)

=

Complete drive
(transmission drive)



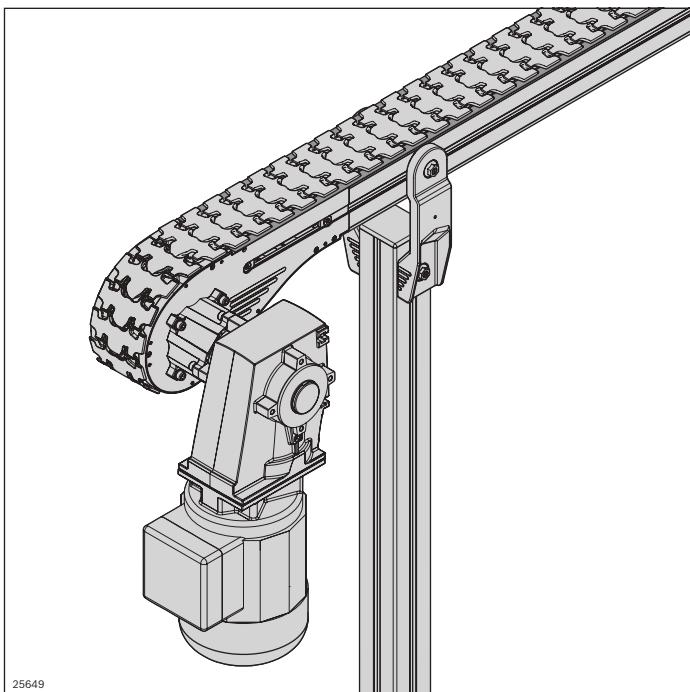
Basic unit curve wheel drive AL

+

Configurable drive kit
(standard gear motor or round shaft)

=

Complete drive



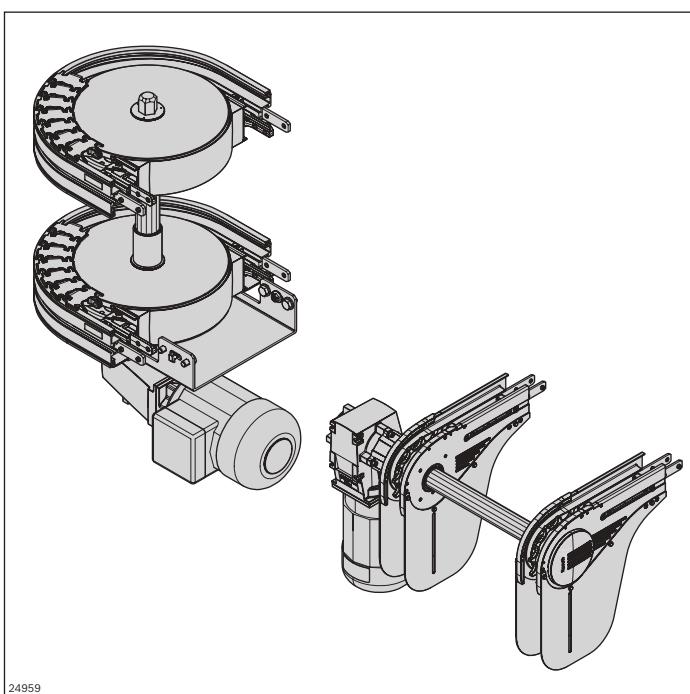
The well thought-out drive solution enables high flexibility and planning freedom

The in-stock, standardized basic units

- Are quickly and easily combined with the configurable drive kit (standard gear motor or customer-specific interface) into a complete drive
- Guarantee fast availability of the few construction kit elements/spare parts

The interface on both sides in the basic unit and return unit

- Enables a free selection of the motor mounting position on-site
- Offers additional transmission interfaces (active bridges)

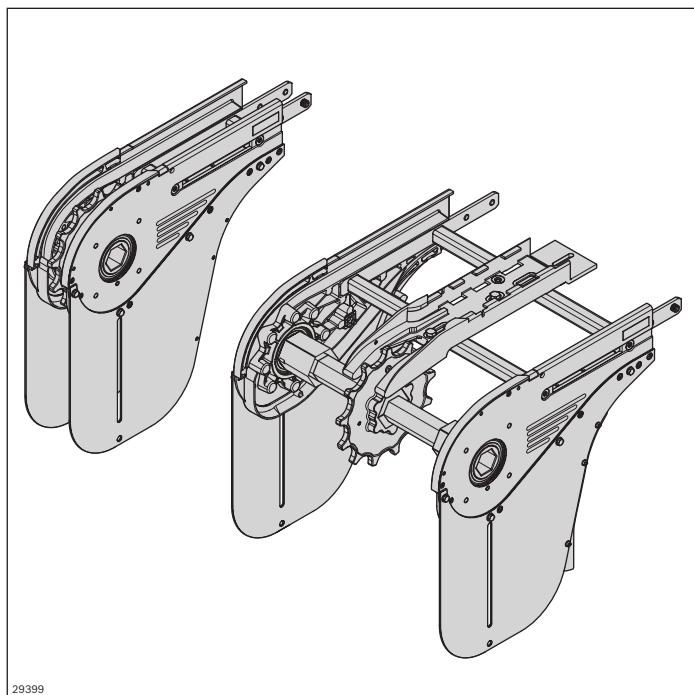


The simple, connectible curve wheel for standard drives and base units facilitates the easy implementation of multi-track systems and alpine conveyors

For attachment options, see the matrix on page 329

Notice: High-pressure cleaning of the ball bearing areas is not permitted.

Basic unit AL head drive direct



The basic unit is quickly turned into a head drive with variable mounting position by adding a drive kit. With the double-sided hexagonal hollow shaft, other components can be easily driven using a transmission (active bridges).

- Size: all track widths
- Suitable chain types: all
- Permissible chain tensile force: $F_{\max} = 1250 \text{ N}$
- Section length: $L \leq 30 \text{ m}$
- Conveyor speed: $v_N = 2 \dots 60 \text{ m/min}$, $v_N = 60 \dots 120 \text{ m/min}$ (see chapter "Technical data" on page 304)
- Chain bag to compensate for chain elongation during service life
- Not suitable for reversible operation

Notes:

- A chain sprocket must be used to limit slipping back of the chain on ascending or descending sections
- Chain sprocket prevents the chain bag from swiveling out

- ▶ Reduced noise emission due to sliding rails guided in the head drive
- ▶ Installation of the drive kit possible on the right/left (motor, coupling, flange)
- ▶ Drive of a parallel conveyor section or bridge using a hexagonal hollow shaft integrated as standard

Required accessories:

- Drive kit, see p. 92
- Sliding rail: Length calculation, see p. 314
- Motor leg set, see p. 121/125

Optional accessories:

- Passive bridge connection kit, see p. 104ff.
- Active bridge connection kit, see p. 110ff.
- Synchronous drive connection kit, see p. 114
- Chain sprocket for inclined sections, see p. 81
- Transmission kit, see p. 102

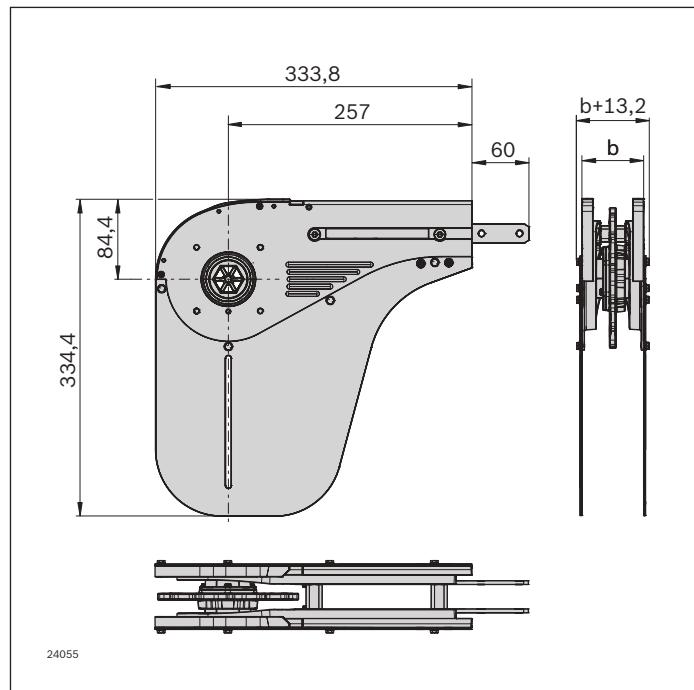
- ▶ Ball bearing made of non-rusting steel (1.4301), with seal on both sides and FDA-compliant grease filling
- ▶ Implementation of parallel sections with gap dimension down to zero
- ▶ Side elements with slot to attach holders for lateral guides, or similar.

Scope of delivery: Incl. fastening material

Condition on delivery: Assembled: Chain guards enclosed

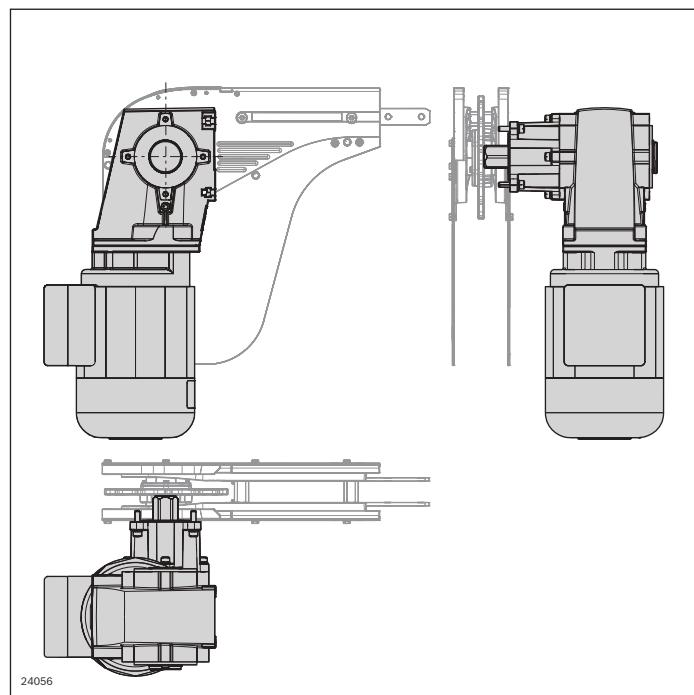
Material:

- Housing: Diecast aluminum, powder-coated, silver
- Chain wheel: PA
- Chain guide: PA
- Connector: Steel; zinc-plated
- Hexagonal shaft up to size 160: PA
- From size 160: Non-rusting steel 1.4301, PA
- Ball bearing: Non-rusting steel 1.4301/FDA



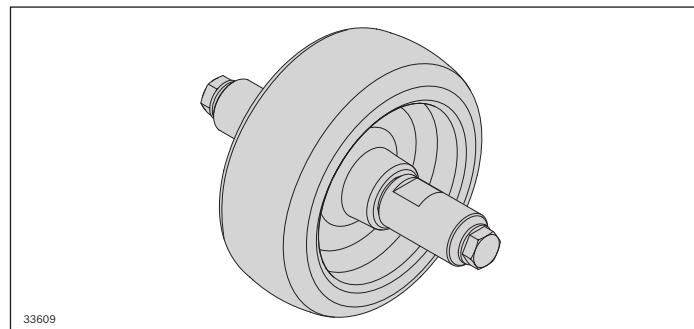
Basic unit AL	No.
VFplus 65 direct	3 842 546 120
VFplus 90 direct	3 842 546 121
VFplus 120 direct	3 842 546 122
VFplus 160 direct	3 842 546 123
VFplus 240 direct	3 842 546 124
VFplus 320 direct	3 842 546 125

Order the drive kit in addition to the AL basic unit (see p. 92) to complete your drive.



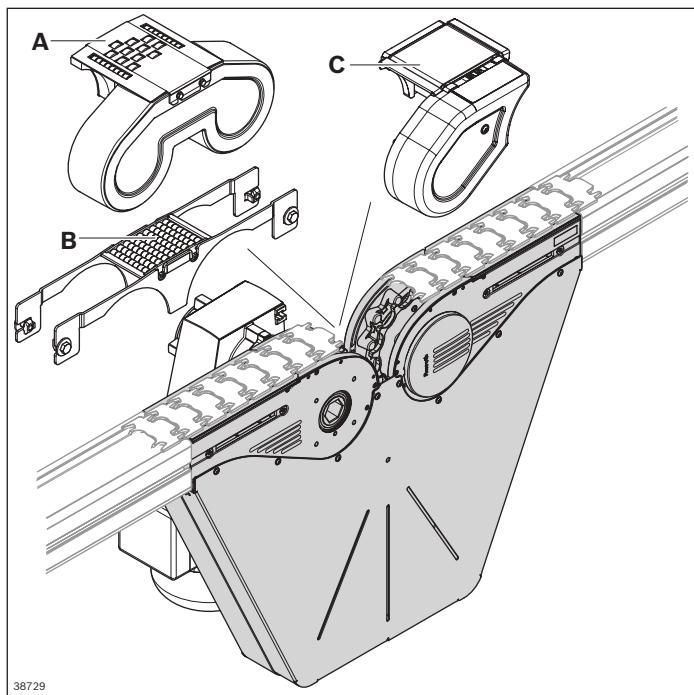
Drive kit VFplus	No.
	3 842 998 291

See p. 92



Chain sprocket	No.
VFplus 65	3 842 553 047
VFplus 90	3 842 553 048
VFplus 120	3 842 553 049
VFplus 160	3 842 553 057
VFplus 240	3 842 553 058
VFplus 320	3 842 553 059

Basic unit AL connection drive



- ▶ Reduced noise emission due to sliding rails guided in the connection drive
- ▶ Installation of the drive kit possible on the right/left (motor, coupling, flange)
- ▶ Drive of a parallel conveyor section or bridge using a hexagonal hollow shaft integrated as standard
- ▶ Ball bearing made of non-rusting steel (1.4301), with seal on both sides and FDA-compliant grease filling
- ▶ Side elements with slot to attach holders for lateral guides, or similar

Required accessories:

- Drive kit, see p. 92
- Passive bridge connection kit, see p. 104ff.
- Active bridge connection kit, see p. 110ff.
- Sliding rail: Length calculation, see p. 314

Scope of delivery:

- Incl. fastening material

The connection drive is used for driving the conveyor chain in circuit systems with a top-running chain. Supplementing the basic unit connection drive with the drive kit quickly turns it into a complete connection drive with a variable mounting position. For transferring the conveyed material, an active (A, C) or passive bridge (B) must be added.

The active bridge (A, C) is driven by a transmission from the connection drive

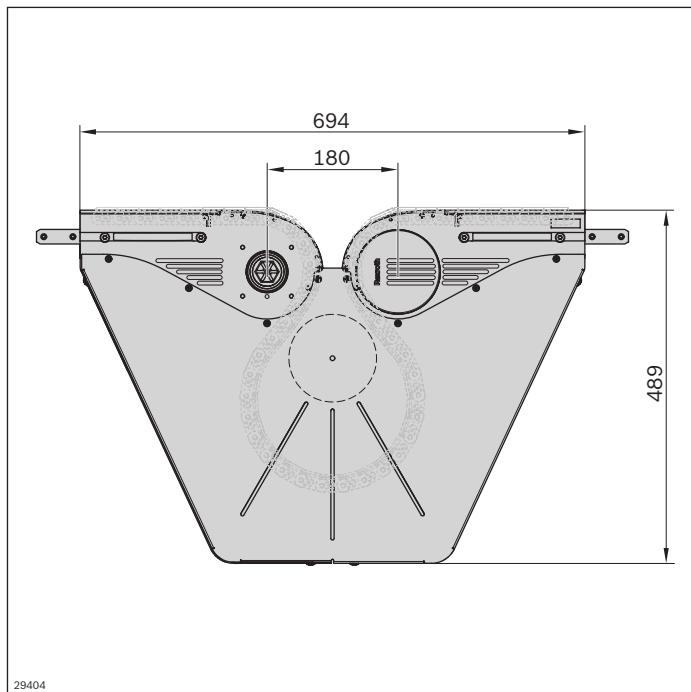
- Size: 65, 90
- Suitable chain types: Flat conveyor chain, static friction chain
- Permissible chain tensile force: $F_{\max} = 1250 \text{ N}$
- Section length: $L \leq 30 \text{ m}$
- Conveying speed: $v_N = 2 \dots 27 \text{ m/min}$, other speeds available on request
- Chain bag to compensate for chain elongation during service life
- Recommendation: No accumulation operation up to 1500 mm after the connection drive
- For safety reasons, only use with a closed profile
- Reversible operation not permitted
- Not permitted for wet operation or rough ambient conditions

Material:

- Housing: diecast aluminum, powder-coated
- Chain wheel: PA
- Chain guide: PA
- Connector: Steel; galvanized
- Hexagonal shaft
Up to size 160: PA
From size 160: Non-rusting steel 1.4301, PA
- Ball bearing: Non-rusting steel 1.4301/FDA
- Chain fender: Steel; zinc-plated

Condition on delivery:

- Assembled

**Basic unit connection drive AL****No.**

VFplus 65	3 842 547 712
VFplus 90	3 842 547 713

Drive kit VFplus**No.**

3 842 998 291

See p. 92

Active roller bridge connection kit (A)**No.**

VFplus 65	3 842 555 820
VFplus 90	3 842 555 821

See p. 112

Active belt bridge connection kit (C)**No.**

VFplus 65	L	3 842 558 000
VFplus 65	R	3 842 558 001
VFplus 90	L	3 842 558 002
VFplus 90	R	3 842 558 003

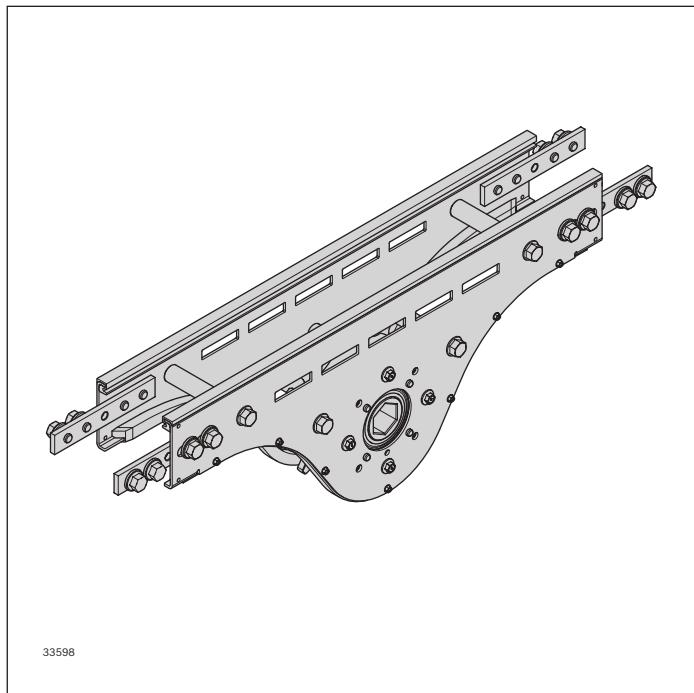
See p. 110

Passive bridge connection kit (B)**No.**

VFplus 65	3 842 549 015
VFplus 90	3 842 549 016

See p. 104

Basic unit center drive



The center drive basic unit is used if the available space is limited at the ends of the sections.

It is quickly turned into a center drive with variable motor mounting position by adding the drive kit

- Size: 65-120
- Chain return on the underside of the profile
- Conveying speed: $v_N = 2 \dots 60 \text{ m/min}$, other speeds available on request
- Permissible chain tensile force: $F_{\max} = 600 \text{ N}$
- Max. conveying length: 7 m
- Because no length compensation (chain bag) is present, the chain length must be checked regularly and shortened if necessary
- Recommendation: no accumulation operation until 1000 mm after the return unit
- An assembly module is required for assembling the chain

- ▶ Reduced noise emission due to sliding rails guided in the center drive
- ▶ Installation of the drive kit possible on the right/left (motor, coupling, flange)
- ▶ Drive of a parallel conveyor section using a hexagonal hollow shaft integrated as standard

Required accessories:

- Drive kit, see p. 85
- Sliding rail, see p. 56
- Motor leg set/ESD motor leg set, see p. 125/212
- Assembly module, see p. 62

Scope of delivery:

- Incl. fastening material
- For AL systems: Adapter VFplus AL-STS

Condition on delivery:

- Assembled (profile connector enclosed)

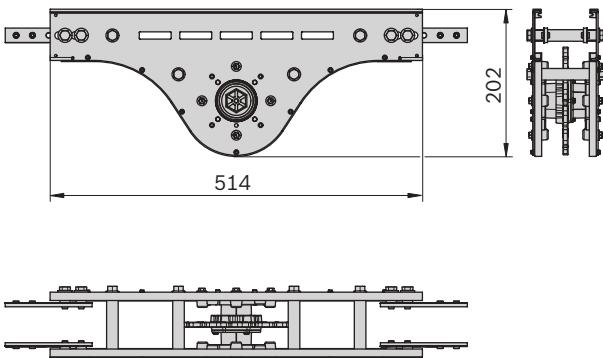
- ▶ Ball bearing made of non-rusting steel (1.4301), with seal on both sides and FDA-compliant grease filling
- ▶ Side elements with slot for attaching holders for lateral guides, or similar

Optional accessories:

- Synchronous drive connection kit, see p. 114
- Frequency converter, see p. 98
- Transmission kit, see p. 102

Material:

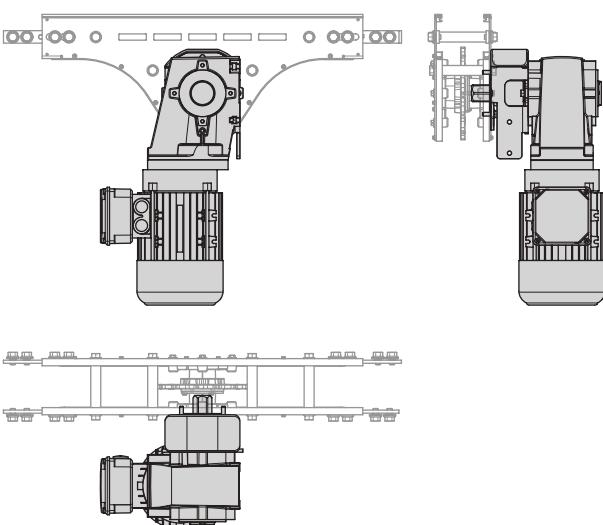
- Housing: Non-rusting steel 1.4301
- Chain wheel: PA
- Chain guide: PA
- Connector: Non-rusting steel 1.4301
- Hexagonal shaft, PA
- Ball bearing: Non-rusting steel 1.4301/FDA



33610

Basic unit center drive**No.**

VFplus 65	3 842 552 940
VFplus 90	3 842 552 941
VFplus 120	3 842 552 942



33600

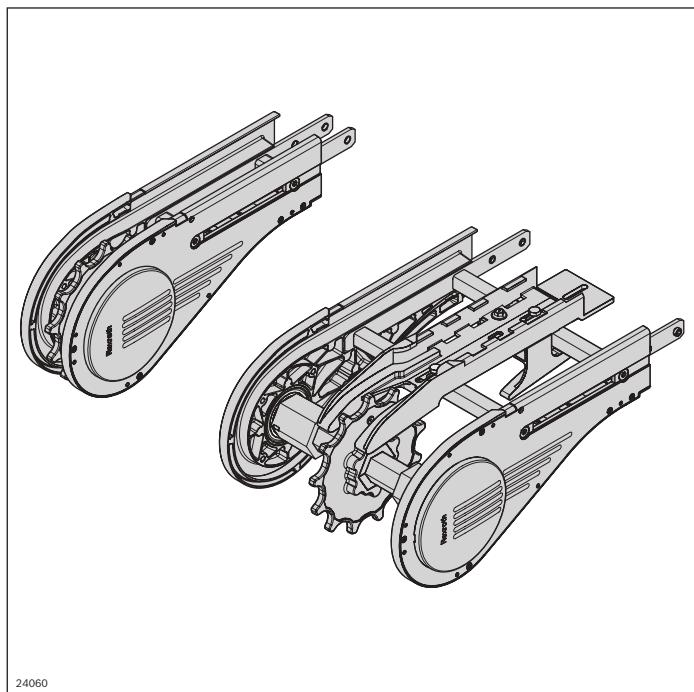
Drive kit VFplus**No.**

VFplus 65	3 842 998 291
See p. 92	

Notice: The selection of the parameter SP = STS is imperative. Even if an aluminum track is used because centering is not possible on an AL flange.

Return unit AL

Closed head drive AL



- ▶ Reduced noise emission due to sliding rails guided in the return unit
- ▶ Installation of the drive kit possible on the right/left (motor, coupling, flange)
- ▶ Drive of a parallel conveyor section or bridge using a hexagonal hollow shaft integrated as standard

Required accessories:

- Sliding rail: Length calculation, see p. 314

For use as a drive:

- Assembly module, see p. 62
- Drive kit, see p. 92
- Motor leg set, see p. 121/125

Scope of delivery:

- Incl. fastening material

Condition on delivery:

- Assembled

Thanks to the innovative drive concept, the return unit can be operated simply by itself or supplemented with a drive kit to be operated as a head drive without chain bag.

The section length is limited to a maximum of 7 m.

- Size: all track widths
- Suitable chain types: all
- Permissible chain tensile force
For return unit function: $F_{max} = 1250$ N
Head drive function without chain bag: $F_{max} = 600$ N with shortened maintenance interval, due to chain elongation
- Section length for return unit function: $L \leq 30$ m
Section length for drive function: $L \leq 7$ m
- Conveying speed: $v_N = 2 \dots 60$ m/min, other speeds available on request
- Use as a drive for wedge conveyors, when combined with a drive kit
- Reversible operation on request

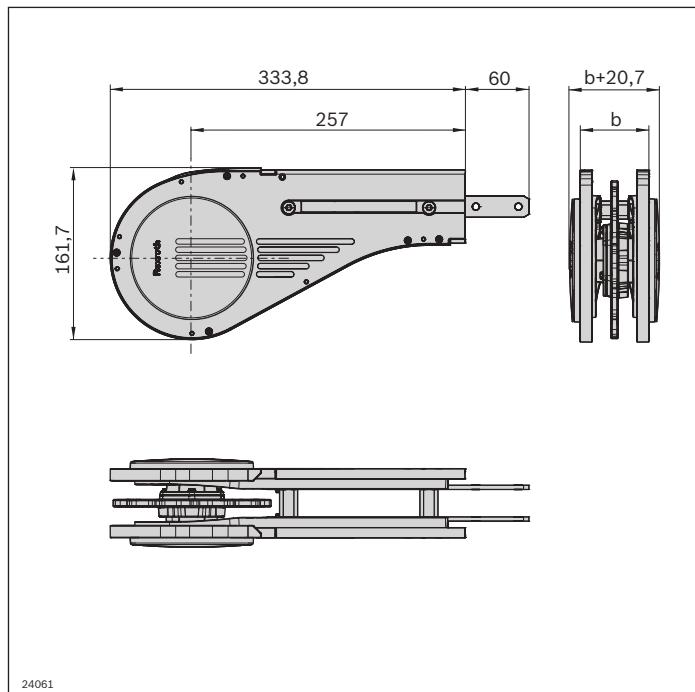
- ▶ Ball bearing made of non-rusting steel (1.4301), with seal on both sides and FDA-compliant grease filling
- ▶ Side elements with slot to attach holders for lateral guides, or similar

Optional accessories:

- Transmission kit, see p. 102

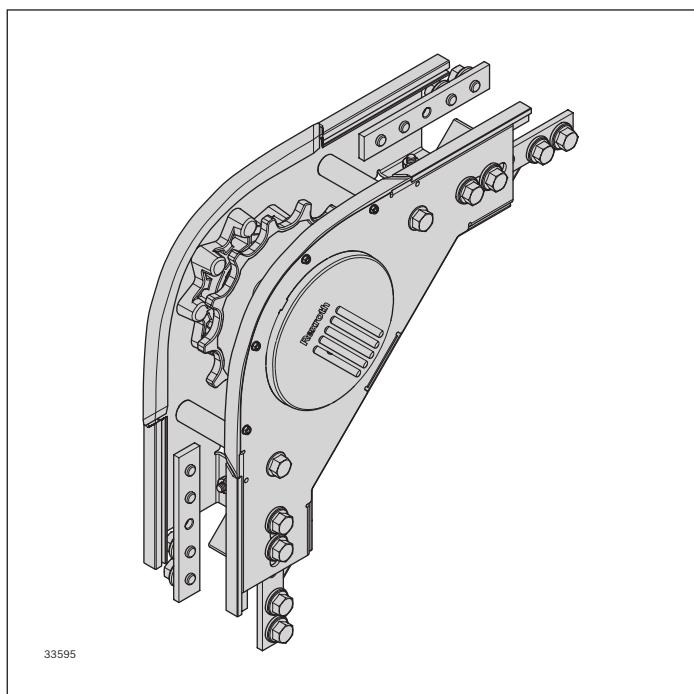
Material:

- Housing: diecast aluminum, powder-coated
- Chain wheel: PA
- Chain guide: PA
- Connector: Steel; galvanized
- Hexagonal shaft
Up to size 160: PA
From size 160: Non-rusting steel 1.4301, PA
- Ball bearing: Non-rusting steel 1.4301/FDA



Return unit AL	No.
VFplus 65	3 842 547 516
VFplus 90	3 842 547 517
VFplus 120	3 842 547 518
VFplus 160	3 842 547 519
VFplus 240	3 842 547 520
VFplus 320	3 842 547 521

90° return unit



Advantage over alpine conveyor with head drive:

- ▶ Shorter chain return, so the required tensile force of the conveyor chain is lower and therefore the possible volume of the alpine conveyor is larger.

Scope of delivery:

- Incl. fastening material
- For AL systems: Adapter AL-STS

Condition on delivery:

- Assembled

For building alpine conveyors with chain running only on the upper side.

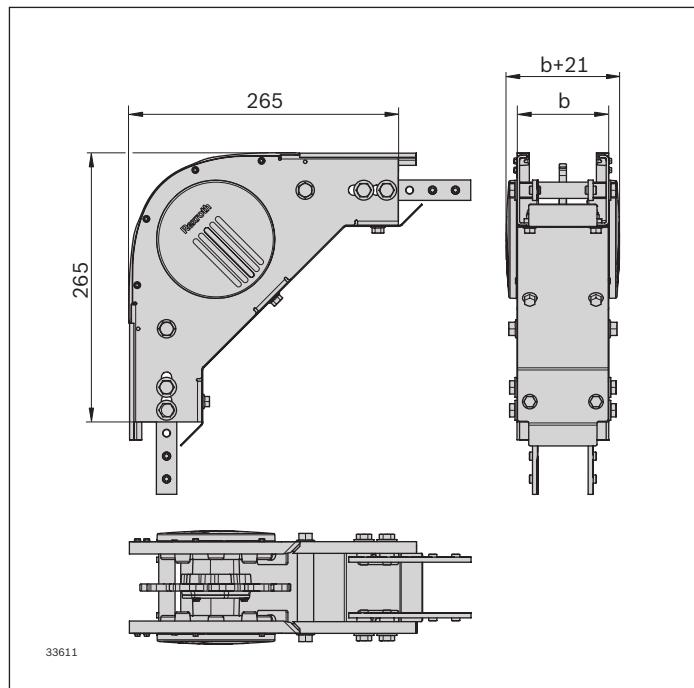
- Only for use with:
 - Connection drive (AL and STS)
 - Curve wheel drive AL (drive kit parameter AC = 1)
- Size: 65, 90
- Section length: $L_{max} = 30$ m
- Alpine conveyor for curve wheel drive or connection drive

Notice: When using conveyor systems without a returning chain, a cover must be mounted by the customer to ensure personal safety.

- ▶ No longer necessary to mount the sliding rails required for the chain return on the bottom side of the profile
- ▶ The required conveyor chain is shorter

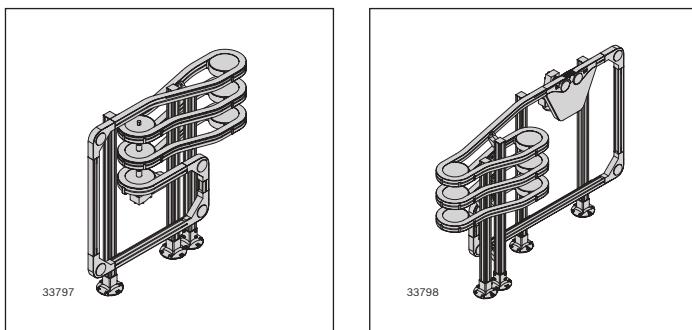
Material:

- Housing: Non-rusting steel 1.4301
- Chain wheel: PA
- Chain guide: PA
- Connector: Non-rusting steel 1.4301
- Hexagonal shaft, PA
- Ball bearing: Non-rusting steel 1.4301/FDA

**90° return unit**

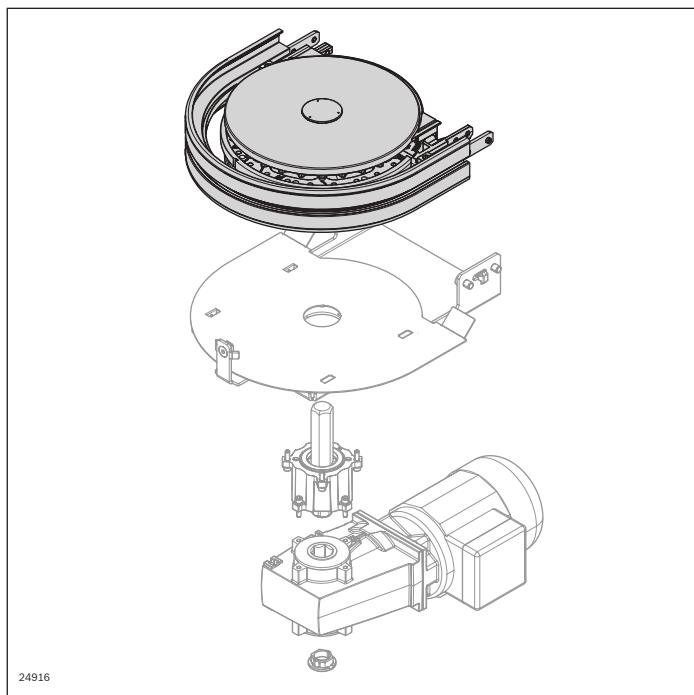
		No.
VFplus 65	1	3 842 552 984
VFplus 90	1	3 842 552 985

3



Basic unit

Curve wheel drive AL



- ▶ Driving several superimposed basic curve wheel units (alpine conveyor) is easily implemented via the integrated hexagonal hollow shafts
- ▶ Ball bearing made of non-rusting steel (1.4301), with seal on both sides and FDA-compliant grease filling
- ▶ Side elements with slot to attach holders for lateral guides, or similar

Required accessories:

- Curve wheel drive kit, see p. 95
- Assembly module, see p. 62
- Sliding rail: Length calculation, see p. 314
- Leg set, see p. 123

Optional accessories:

- Alpine conveyor connection kit, see p. 116

The curve wheel drive is used for driving the conveyor chain in circuit systems with a top-running chain. Combining the base unit curve wheel 180° AL with the appropriate drive kit quickly turns it into a curve wheel drive.

- Size: 65, 90
- Suitable chain types: all
- Permissible chain tensile force: $F_{max} = 400$ N per level Section length for closed circuits $L \leq 10$ m
- Permissible torque: $M_{max} = 60$ Nm

When combining several curve wheel base units, the motor torque must be distributed across the individual levels

- Conveying speed: $v_N = 4 \dots 21$ m/min.

On drives with a frequency converter (FU), the speed must be limited to a maximum of 21 m/min using control technology

- Recommendation: no accumulation operation until 1000 mm after the curve wheel drive
- Can only be used with a closed profile

Scope of delivery:

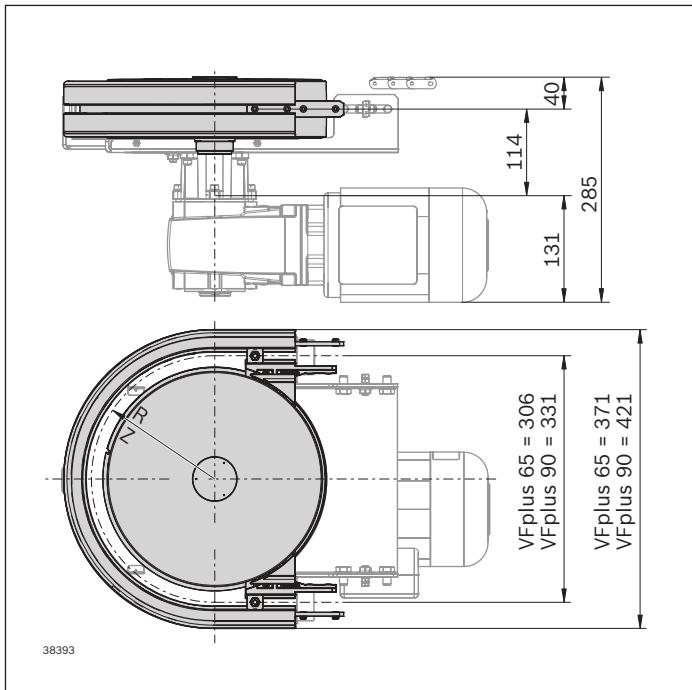
- Incl. fastening material

Condition on delivery:

- Assembly required

Material:

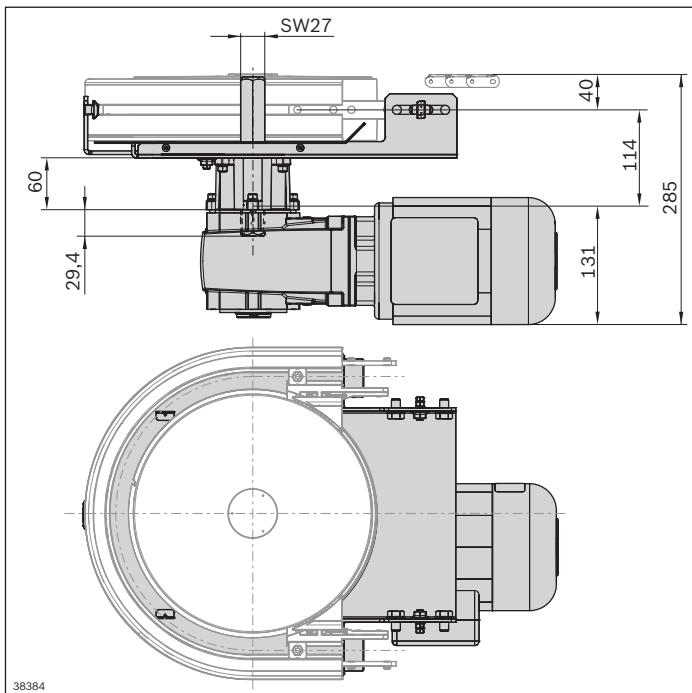
- Housing: Diecast aluminum
- Chain wheel: PA; white
- Ball bearing: Non-rusting steel 1.4301/FDA



Basic unit curve wheel AL	α (°)	No.
VFplus 65	180	3 842 547 380
VFplus 90	180	3 842 547 381

R (mm)	Z ¹⁾
VFplus 65	153.0
VFplus 90	165.5

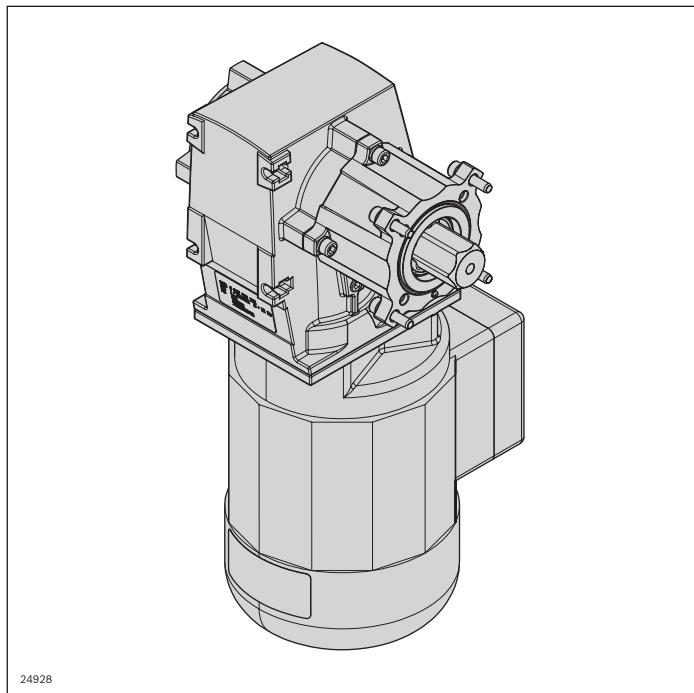
¹⁾ Number of teeth



Drive kit curve wheel VFplus AL	No.
	3 842 998 742

See also page 95

Drive kit



- The adjustable ball catch coupling is protected and integrated in the flange to save space

Optional accessories:

- Frequency converter, see p. 98

Scope of delivery:

- Incl. fastening material
- Incl. flange, shaft and gear motor (GM = 1)

Material:

- Flange, motor: Diecast aluminum
- Shaft: Non-rusting steel 1.4301/PA
- Ball catch coupling: Steel

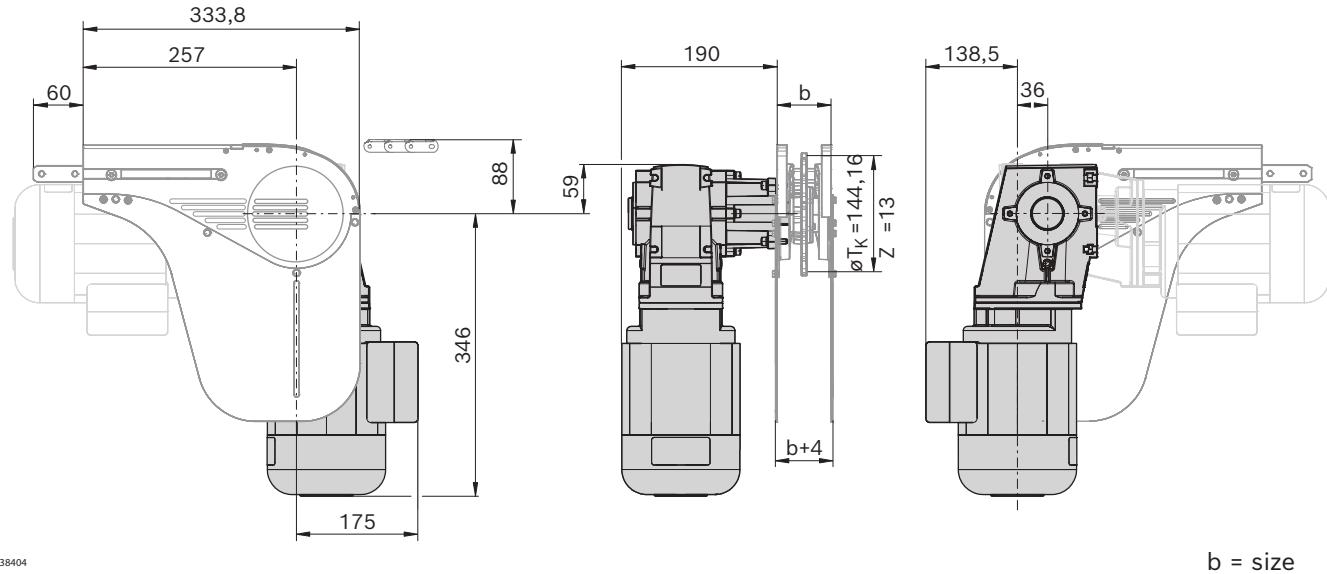
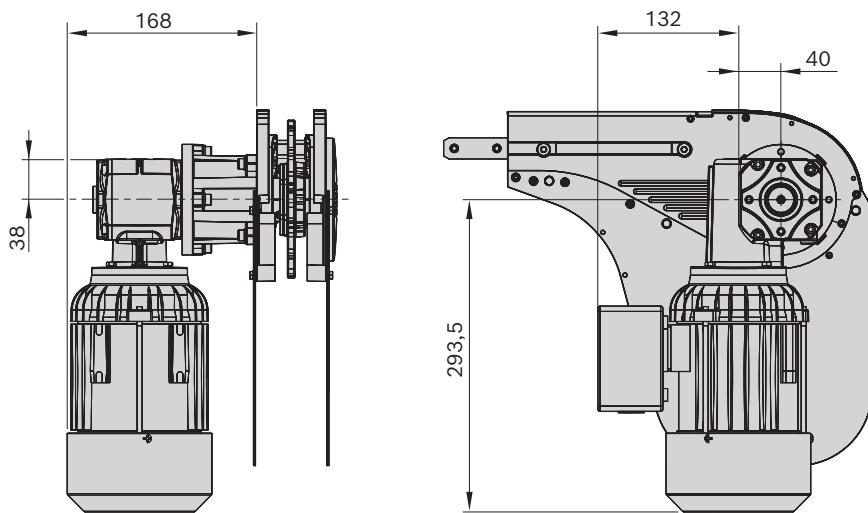
The drive kit is designed to operate the basic head drive/connection drive units and the return unit (closed drive). It contains a flange for attaching the motor to the basic unit, a hexagonal shaft for transmission of force, as well as other optional equipment features.

- Versions in aluminum (SP = AL) or stainless steel (SP = STS)
- For SP=AL, with adjustable ball catch coupling (Kpg = 1) or without (Kpg = 0). The coupling does not provide personal safety. Preset to maximum chain tensile force at the factory
- With Lenze gear motor (GM = 1) or with an interface for attaching an SEW SA47 gear motor (GM = 2). An adaptation is required by the customer for attaching other gear motors (GM = 0), see p. 93
- In order to ensure a compact installation situation, lighter gear motors (GM = 3) or an interface for the installation of an SEW SA37 gear motor (GM = 4) are available for applications with low load
- Fixed or adjustable speed (v_N). For an adjustable speed, gear motors must be retrofitted with an FU (frequency converter), see p. 98
- Different voltages and line frequencies (U/f)
- Connections are made using terminal boxes (AT = K) or plugs (AT = S)
- GM = 1 without surface and corrosion protection

Notice: If third-party motors (GM = 0, GM = 2) are used, support directly on the motor may be required (to avoid twisting).

Condition on delivery:

- Kit

SP = AL, GM = 1**SP = AL, GM = 3**

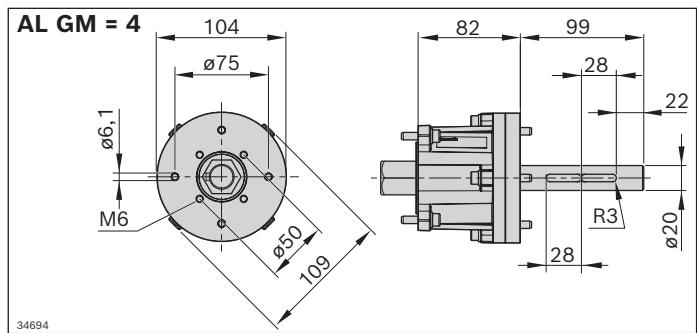
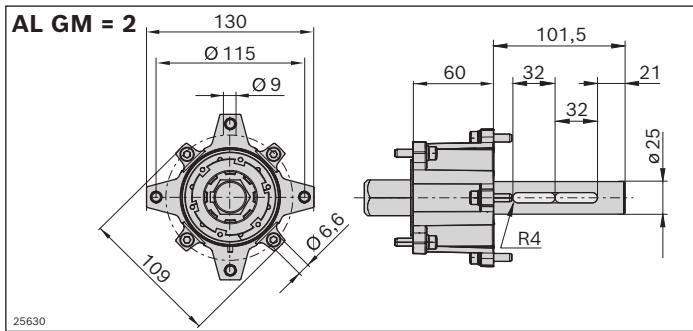
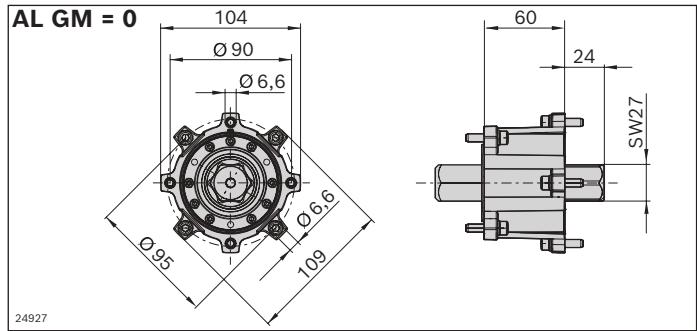
Drive kit VFplus	SP	GM	Kpg	v_N (m/min)**	U/f (V/Hz)	AT	No.
AL; STS*	0: 1; 2; 3; 4	0; 1		5, 10, 13, 16, 21, 27, 33, 40, 50		K; S	3 842 998 291

See p. 317

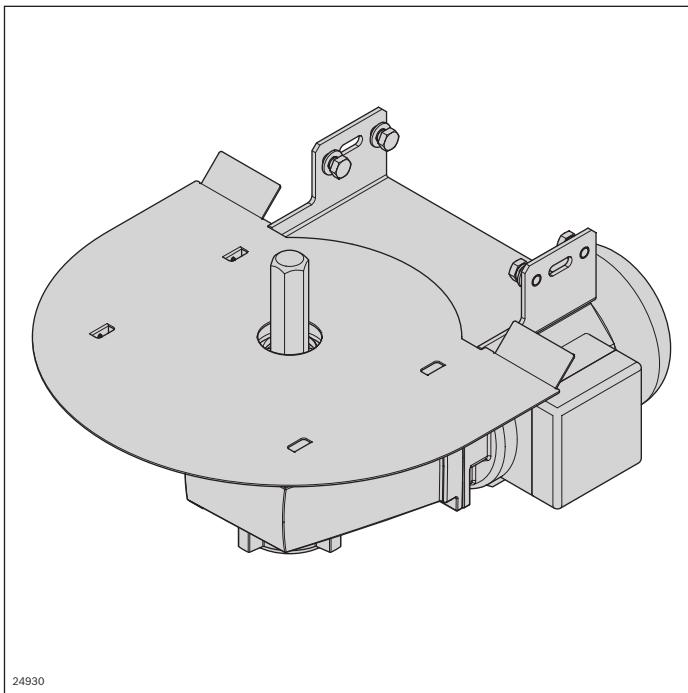
SP = ...
GM = ...
Kpg = ...
 v_N = ...
U/f = ...
AT = ...

* STS version see p. 168

** v_N 60-120 on request



Drive kit curve wheel AL



24930

- ▶ The transmission of force of several superimposed curve wheels is possible. The motor torque then has to be distributed across all curve wheel levels
- ▶ The adjustable ball catch coupling is protected and integrated in the flange to save space

The 180° curve wheel (aluminum version) is quickly transformed into a curve wheel drive by using a drive kit. It contains a flange for attaching the motor to the curve wheel, a hexagonal shaft for transmission of force, as well as other optional equipment features.

Required accessories:

- Motor leg sets, see p. 191

Scope of delivery:

- Incl. fastening material
- Incl. guard plate (contact protection from below)
- Incl. flange, shaft and gear motor (GM = 1)

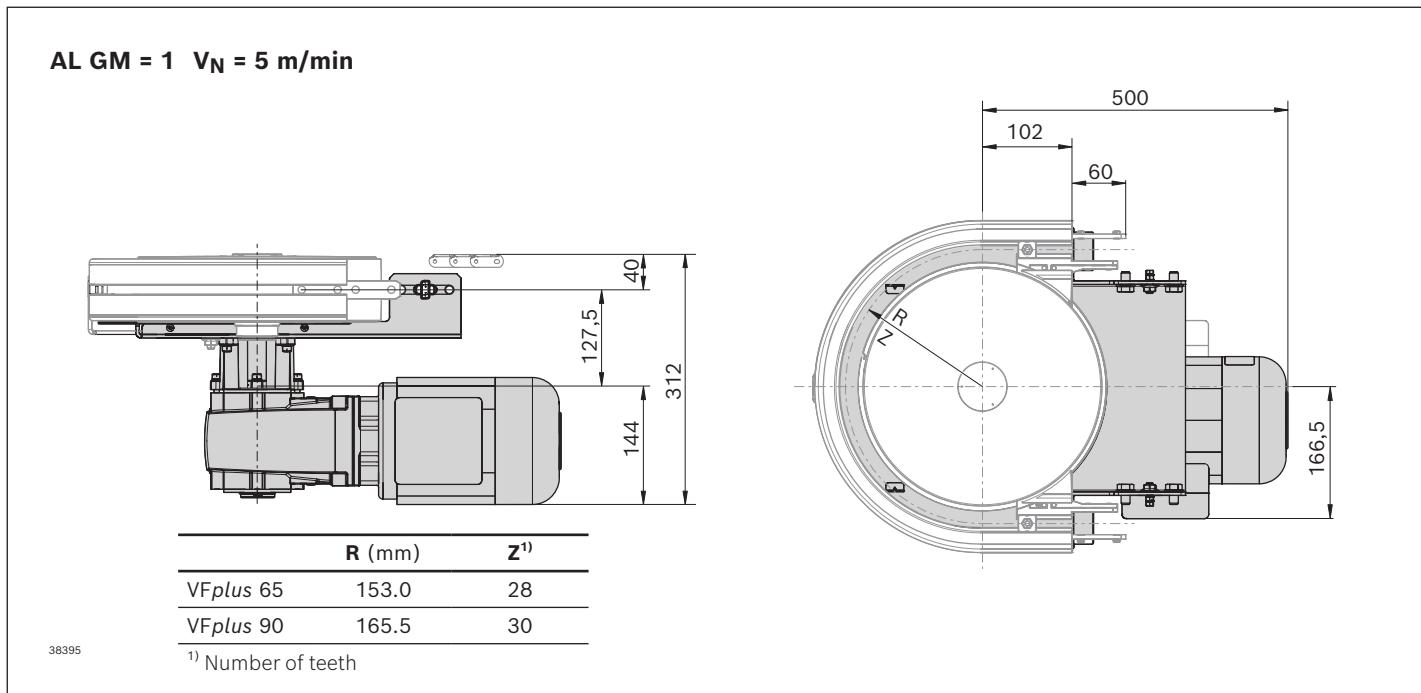
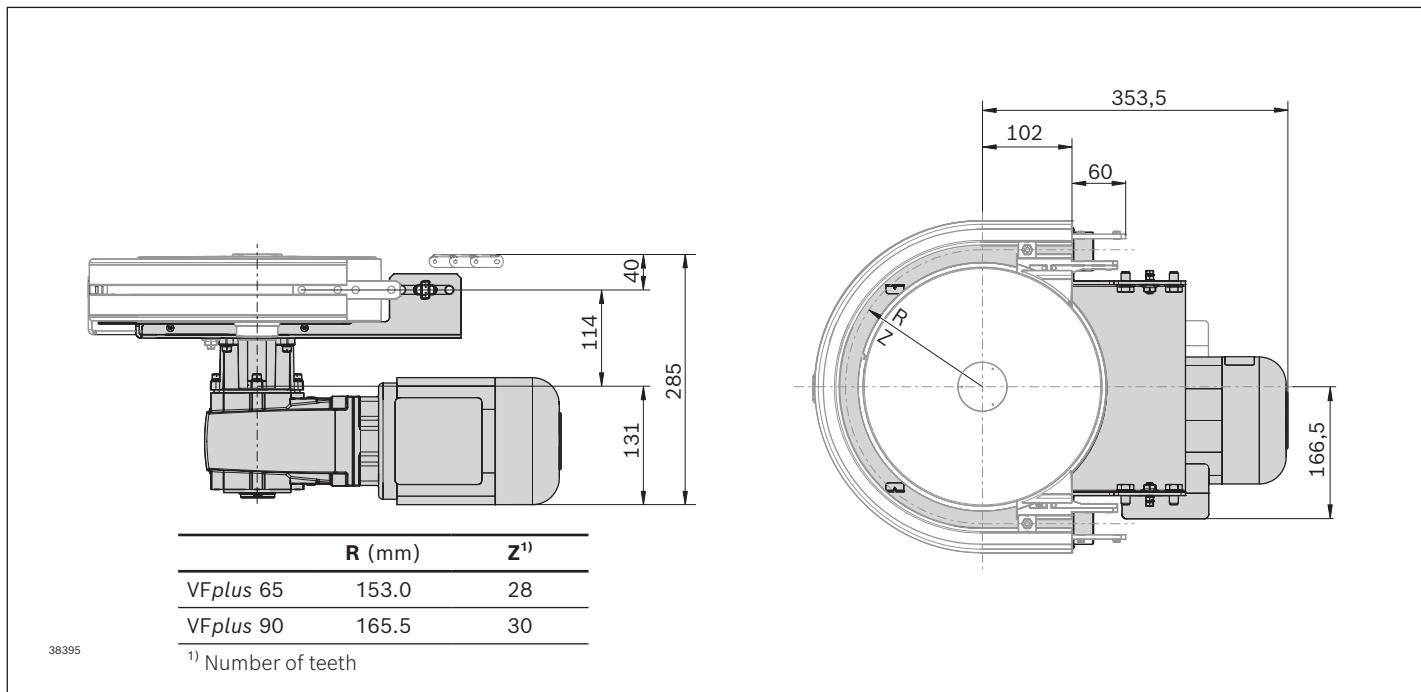
- For assembly of a circulation system with curve wheel (AC = 0) or assembly of an alpine conveyor tower (AC = 1)
- With preset ball catch coupling (Kpg = 1) for limiting the torque or for the drive kit of the alpine conveyor tower (AC = 1) also without (Kpg = 0). The coupling does not provide personal safety
- With Lenze gear motor (GM = 1) or with an interface for attaching an SEW SA47 gear motor (GM = 2). An adaptation is required by the customer for attaching other gear motors (GM = 0), see p. 96
- In order to ensure a compact installation situation, an interface for the installation of an SEW SA37 gear motor (GM = 4) is available for applications with low load
- Fixed or adjustable speed (v_N). For an adjustable speed, gear motors must be retrofitted with an FU (frequency converter), see p. 98
- Different voltages and line frequencies (U/f)
- Connections are made using terminal boxes (AT = K) or plugs (AT = S)
- GM = 1 without surface and corrosion protection
- Conveying speed: $v_N = 4 \dots 21 \text{ m/min}$ For drives with frequency converters (FU), the speed must be limited to a maximum of 21 m/min using control technology

Condition on delivery:

- Kit

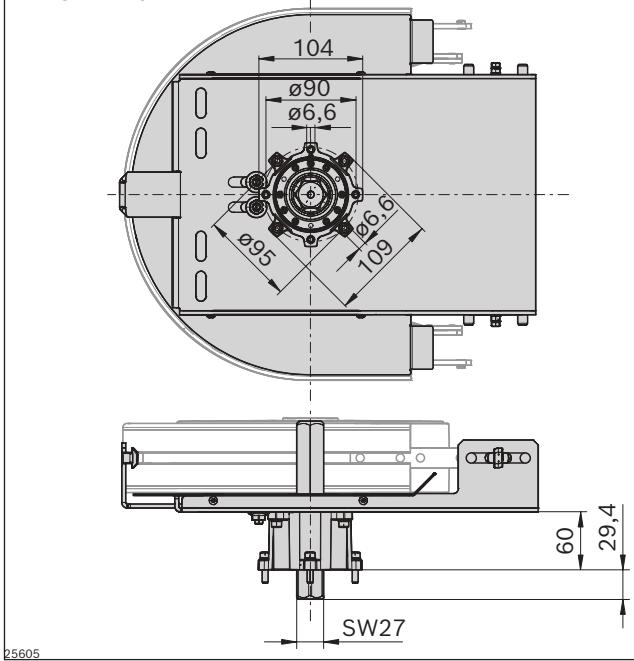
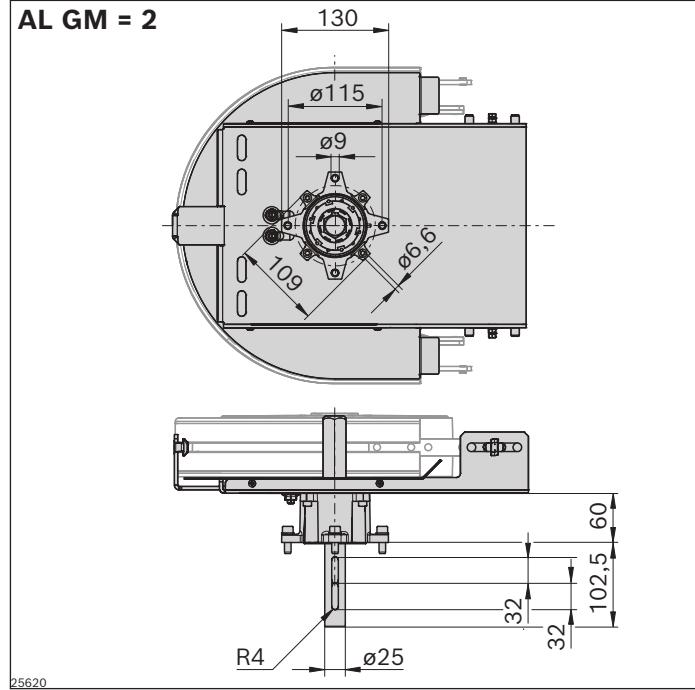
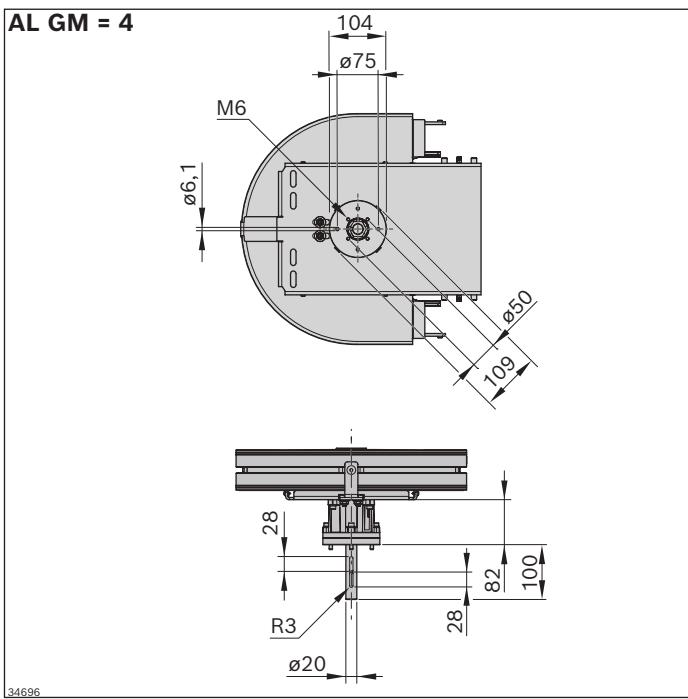
Material:

- Flange: Diecast aluminum
- Shaft: STS
- Connecting sheet, cover sheet: Steel; zinc-plated
- Ball catch coupling: Steel

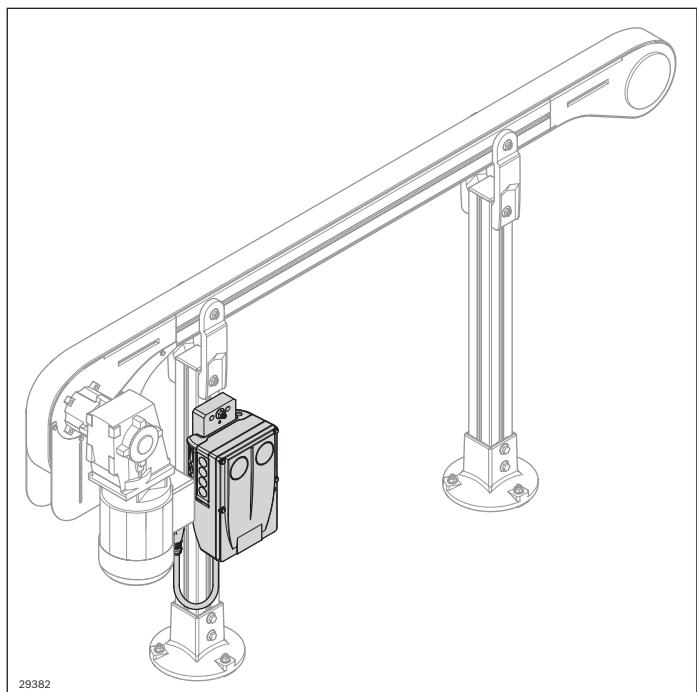


Drive kit curve wheel AL	GM	AC	b (mm)	Kpg	v _N (m/min)	U/f (V/Hz) See p. 317	AT	No.
	0; 1; 2; 4	0; 1	65, 90	0; 1	5, 10, 13, 21		K; S	3 842 998 742

GM = ...
AC = ...
b = ...
Kpg = ...
v_N = ...
U/f = ...
AT = ...

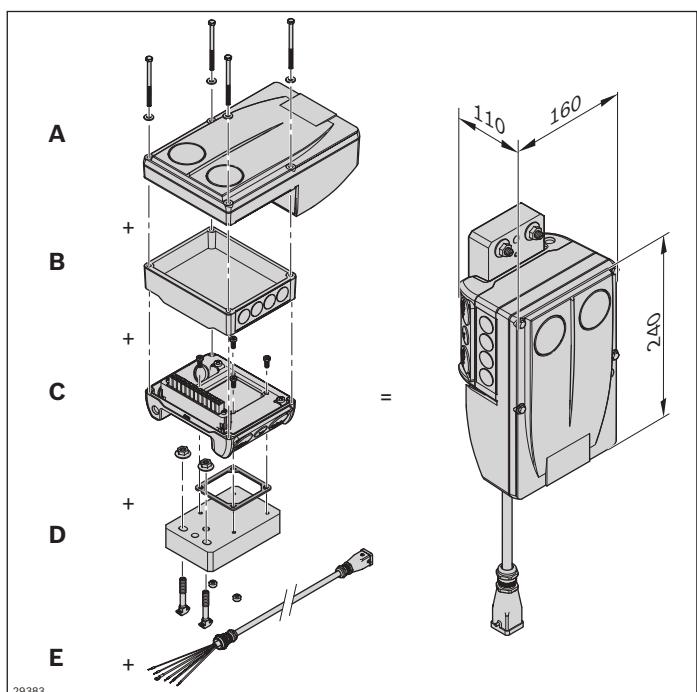
AL GM = 0**AL GM = 2****AL GM = 4**

Frequency converter motec 8400



In order to operate a gear motor with adjustable speed, the motor needs to be retrofitted with a frequency converter (FU). The frequency converter has a modular design so that it can be easily mounted on a leg set and connected to the motor by cable.

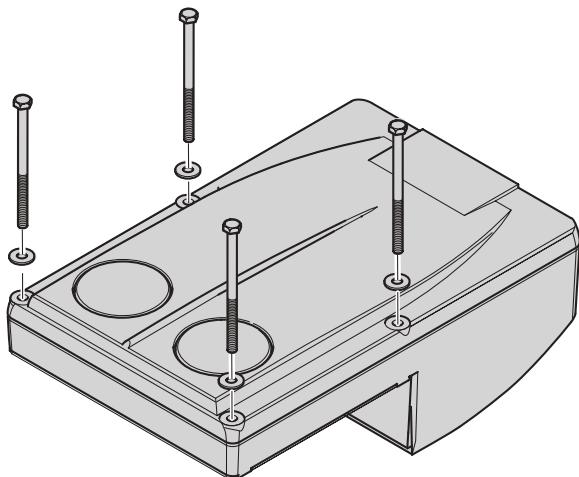
- Connection power: 0.55 kW
- Speed (v_N) depending on the base speed of the gear motor used



Complete frequency converter consisting of the modules

- Frequency converter power unit (**A**)
- Communication module (**B**)
- Connection unit (**C**)
- Attachment kit (**D**)
- Optional: Connection cable (**E**) for the plug-in connection to the gear motor (AT = S)

The individual modules can be ordered separately and are easy to connect with the screws supplied with the scope of delivery. For the internal and external voltage supply, the modules must be wired by the user (see terminal box assignment, page 323).

A

29384

Frequency converter (A)

Power unit: 0.55 kW

3/PE AC 320 V -0 % ... 528 V +0 %,

45 Hz -0 % 65 Hz +0 %

- Easy start-up via manual control unit
- Easy-to-replace memory module
- Large LED status indicator

Frequency converter**No.**

0.55 kW power unit

3 842 553 447

The speed range of the frequency converter *) is based on the base speed of the motor:

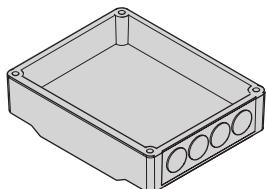
Motor speed range (m/min) at 50 Hz	Min¹⁾ (m/min)	Max²⁾ (m/min)
5 ³⁾	2	6
10 ³⁾	4	12
13	5	15
16	6	19
21	7	25
27	9	32
33	11	39
40	13	48
50	16	60

*) By accepting a resulting loss of power, a higher bandwidth can be covered (see p. 323)

¹⁾ Min corresponds to approx. 16 Hz supply frequency

²⁾ Max corresponds to approx. 60 Hz supply frequency

³⁾ At 460 V/60 Hz max (m/min) 20 % higher

B

29385

Communication module (B)

- Used to control the frequency converter
- Cable connection options
- Standard version without "integrated safety system STO (safety torque off)" (available on request)

Depending on their function, the individual communication modules are provided with the corresponding connections.

Communication module**No.**

Standard I/O

3 842 553 449

AS-i

3 842 553 453

CANopen

3 842 553 454

EtherNet/IP

3 842 553 451

EtherCAT

3 842 553 459

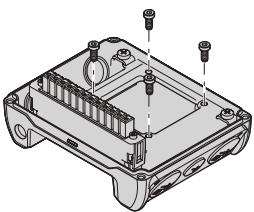
PROFIBUS

3 842 553 452

PROFINET

3 842 553 450

C



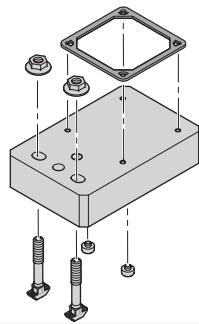
29386

Connection unit (C)

- Power grid connection options

Connection unit	No.
	3 842 553 445

D



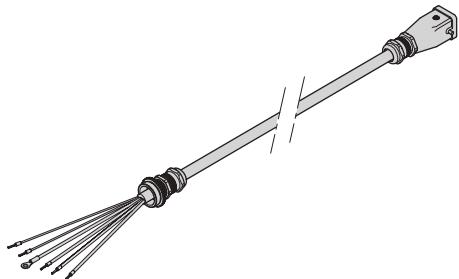
29387

Attachment kit (D)

- For the simple attachment of the frequency converter to the AL leg set (slot/s with a 60 or 80 strut profile)

Attachment kit	No.
	3 842 553 457

E



29426

Connection cable (E)

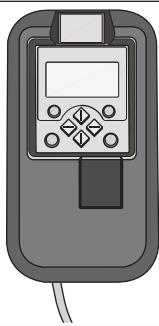
- For connecting the gear motor to the frequency converter (length: 1 m)
- For the drive kit AT = S (direct wiring with AT = K)

Connection cable	No.
	3 842 553 512

Manual control unit



3

A

29416

Manual control unit

The manual control unit is required for the parameterization of drives with frequency converters.

In addition, you can:

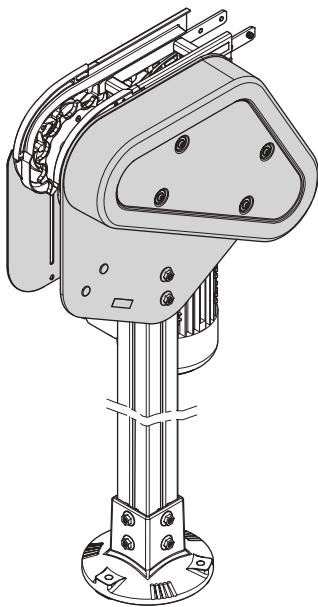
- Control (e.g. block and release)
- Display operating data
- Steplessly regulate the transport speed
- Transfer parameter sets to other basic devices

Manual control unit

No.

3 842 552 821

Transmission kit



33603

- ▶ Installation of the drive kit possible on the right/left (motor, coupling, flange)
- ▶ Very quiet, as transmission takes place through toothed belt

Required accessories:

- Leg set, see p. 121

Scope of delivery:

- Incl. fastening material

Material:

- Side plates: Non-rusting steel 1.4301
- Belt: Rubber compound
- Cover: ABS
- Connecting parts: Aluminum
- Adapter: POM, non-rusting steel 1.4301

If the available space is not sufficient for mounting the drive kit directly on the basic unit, the transmission kit also enables conversion to a transmission drive at a later date.

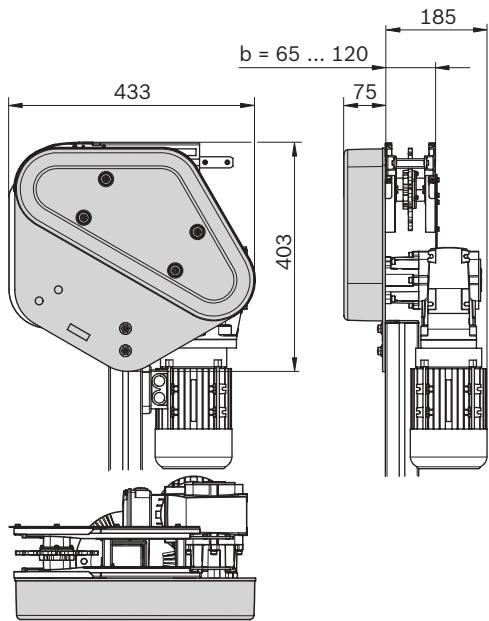
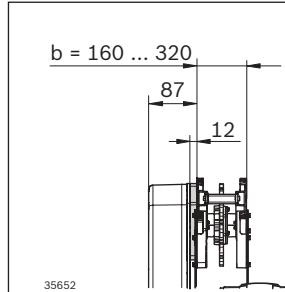
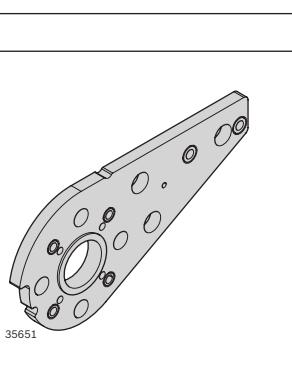
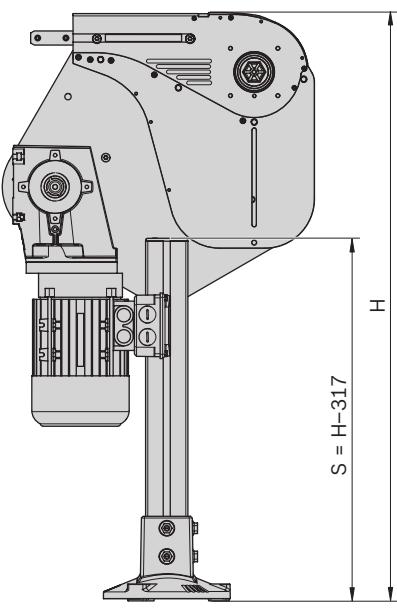
The basic units head drive direct and closed head drive are quickly turned into a transmission drive with variable mounting position with the transmission kit and drive kit.

- Only for AL systems
- Size: 65, 90, 120
- Can also be used in sizes 160, 240, 320 with the additional adapter 3 842 559 108
- Permissible chain tensile force: $F_{\max} = 1250 \text{ N}$
- Support required
- Not suitable for wet operation/cleaning
- Mounting on STS version on request

- ▶ Ball bearing made of non-rusting steel (1.4301), with seal on both sides and FDA-compliant grease filling

Condition on delivery:

- Assembled

**Transmission kit VFplus****No.****3 842 552 900****b = 65, 90, 120****Adapter VFplus
Transmission AL 160-320****No.****3 842 559 108****b = 160, 240, 320****Motor support**

The support is mounted on the inside (below the chain).

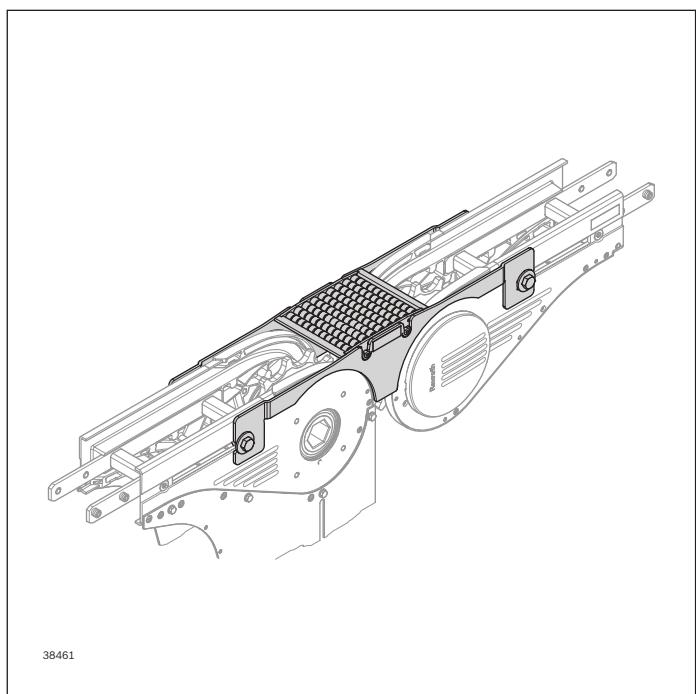
Notice: The motor must be mounted so that there are no collisions with the support.

H: Transport height (top edge of chain)

S: Leg set height

L: Profile length ($L = S - 15$)

Passive bridge connection kit



The passive bridge is used as a transfer unit between the basic unit and return unit or with the connection drive to bridge the conveyor trench.

- Size 65-120: Only for flat conveyor chain and static friction chain
- Size 160: Only for flat chain t7
- For dimensionally stable products with an even transport surface
- Height adjustment: approx. 2 mm
- The conveyed goods are transferred via passive rollers
- Suitable for goods from approx. 300 mm length

- ▶ Can be retrofitted into a standard configuration at any time

Scope of delivery:

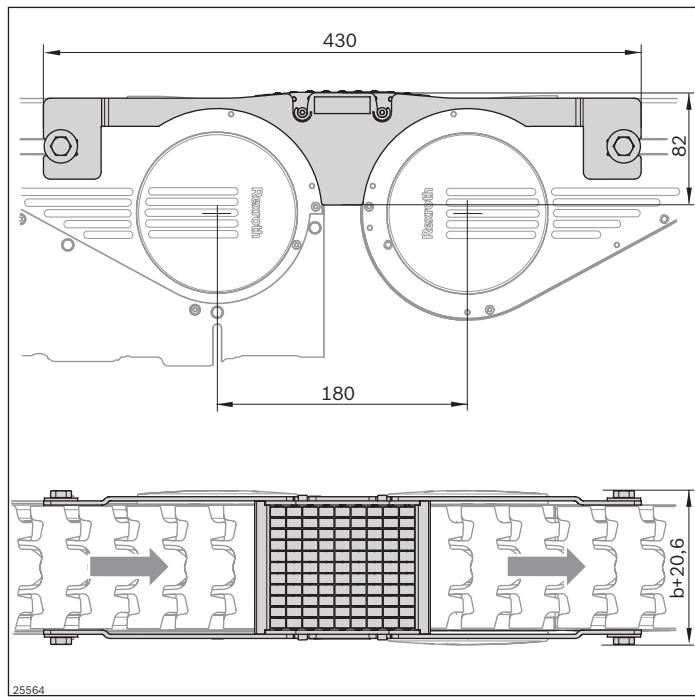
- Incl. fastening material

Material:

- Non-rusting steel 1.4301, POM

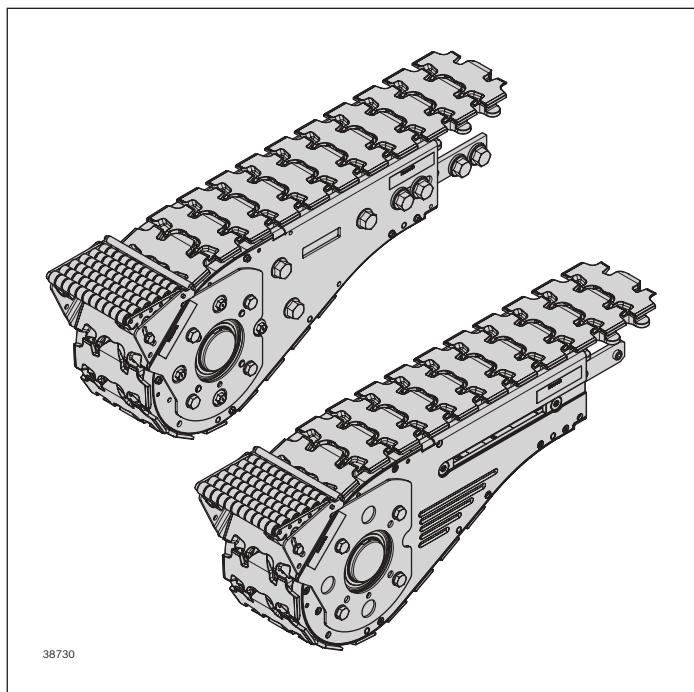
Condition on delivery:

- Some assembly required

**Passive bridge connection kit****No.**

VFplus 65	3 842 549 015
VFplus 90	3 842 549 016
VFplus 120	3 842 549 017
VFplus 160	3 842 549 018

Short passive bridge connection kit



The short passive bridge is used as a transfer unit between the basic unit or return unit and a third-party conveyor to bridge the conveyor trench.

- Each in a separate version for a flat conveyor chain and static friction chain
- For dimensionally stable products with an even transport surface
- The conveyed goods are transferred via passive rollers
- Suitable for goods from approx. 150 mm length
- Inclination adjustment $\pm 15^\circ$ (only the gradient)

- ▶ Can be retrofitted into the basic unit and return unit at any time (cannot be combined with the transmission kit)
- ▶ Suitable for mounting on AL and STS

Scope of delivery:

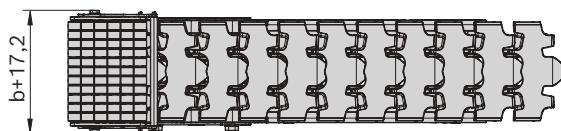
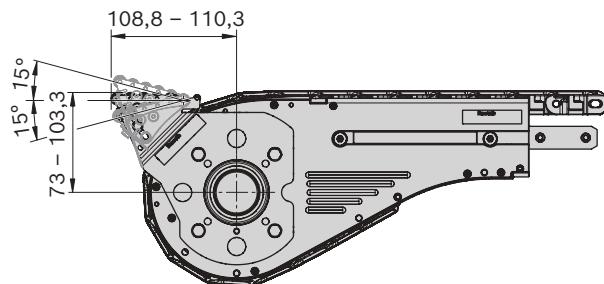
- Incl. fastening material

Material:

- Non-rusting steel 1.4301, POM

Condition on delivery:

- Some assembly required



35630

**Short passive bridge connection
kit for flat conveyor chain**

No.

VFplus 65 3 842 558 050

VFplus 90 3 842 558 051

VFplus 120 3 842 558 052

**Short passive bridge connection
kit for static friction chain**

No.

VFplus 65 3 842 558 078

VFplus 90 3 842 558 079

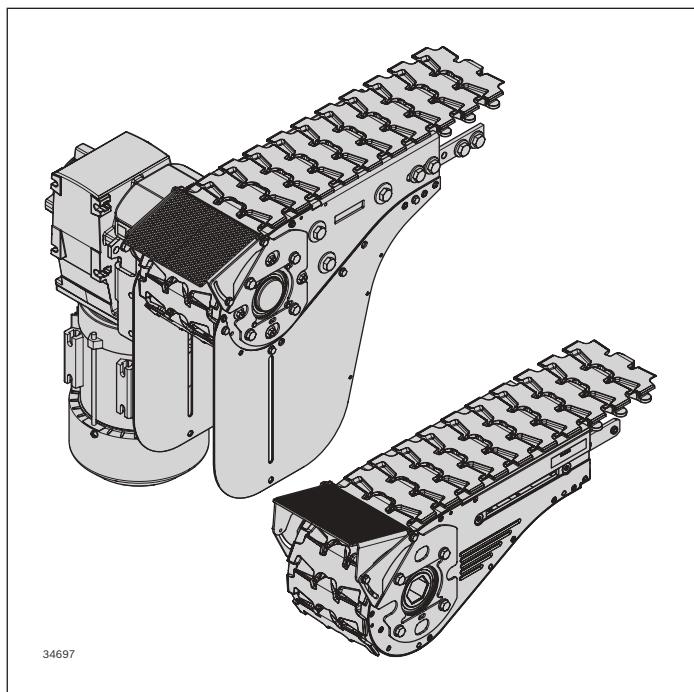
VFplus 120 3 842 558 080

**Short passive bridge connection
kit for flat conveyor chain t7**

No.

VFplus 160 3 842 558 081

Short sliding bridge connection kit



The short sliding bridge is used as a favorably priced, linear transfer unit between the basic unit or return unit and a third-party conveyor to bridge the conveyor trench.

- Suitable for conveyed materials from approx. 80 mm in length (depending on the angle of inclination, speed, position of the center of gravity, geometry, product friction, ...)
- The material to be conveyed is transferred via a corrugated metal sheet with an inclination adjustment of $\pm 15^\circ$ (gradient only)
- Size: 65-320
- Version for flat conveyor chain
- Due to potential deflection with even weight distribution, max. loading of sizes 240 and 320 limited to:
 - Size 240: 6 kg
 - Size 320: 5 kg
 - For products with a low bridge width, the maximum loading capacity is reduced: Request, test required

- ▶ Can be retrofitted into the basic unit and return unit at any time (cannot be combined with the transmission kit)

Scope of delivery:

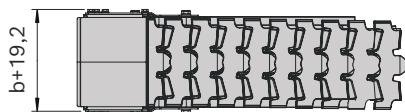
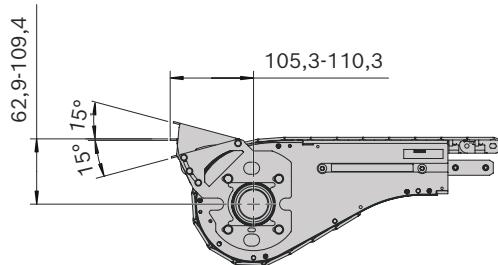
- Incl. fastening material

Material:

- Non-rusting steel 1.4301

Condition on delivery:

- Some assembly required



42129

**Short sliding bridge connection kit
for flat conveyor chain**

No.

VFplus 65	3 842 571 170
VFplus 90	3 842 571 171
VFplus 120	3 842 571 172

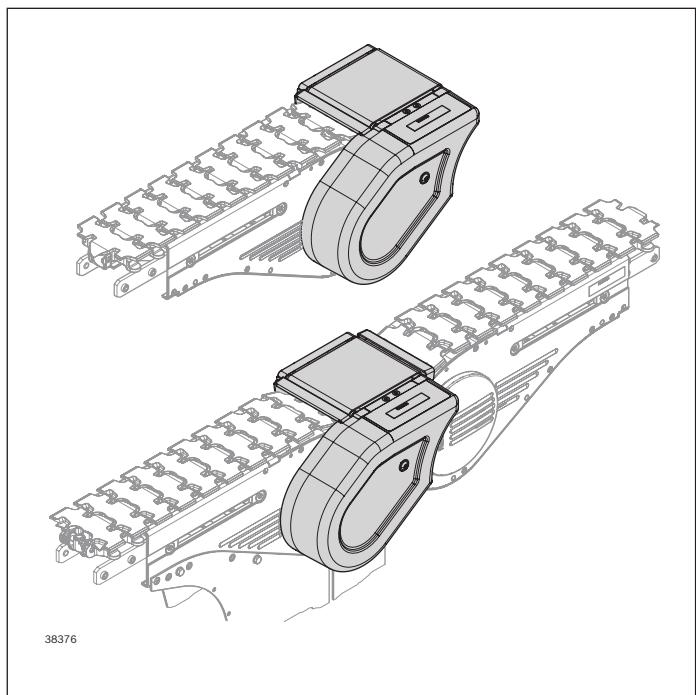
**Short sliding bridge connection
kit for flat conveyor chain t7**

No.

VFplus 160	3 842 571 206
VFplus 240	3 842 571 207
VFplus 320	3 842 571 208

Short sliding bridge connection kit for static friction chain
on request

Active belt bridge connection kit



- ▶ Simple transmission of the drive force using hexagonal hollow shafts integrated into the base unit or return unit as standard
- ▶ Can be retrofitted into a standard configuration at any time
- ▶ Easy replacement of the belt from the top

Scope of delivery:

- Incl. fastening material
- Transmission and protective cover

Material:

- Aluminum, non-rusting steel 1.4301, PA, PE, ABS, PUR

The active belt bridge is used as a transfer unit for bridging the conveyor trench

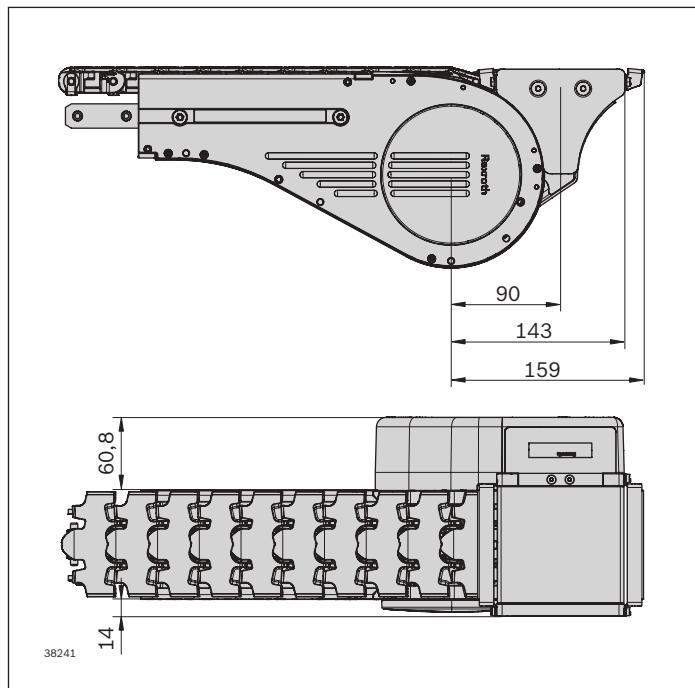
- between the basic unit and return unit
- between the start or end of a conveyor section and a third-party conveyor
- in the connection drive
- Size 65-120: Only for flat conveyor chain and static friction chain
- Size 160: Only for flat chain t7

The active belt bridge is driven by a transmission (on the drive or return side).

- Suitable for conveyed materials from approx. 80 mm in length (depending on the speed, position of the center of gravity, product friction, etc.)
- Installation possible on both the drive and return side (make sure to use the correct L/R version)
- Not permitted for wet operation, rough ambient conditions or sharp-edged products
- Load depending on the speed (see diagram)
- The speed of the adjacent conveyor should be approximately the same to prevent premature wear
- Accumulation not permitted

Condition on delivery:

- Some assembly required


Active belt bridge connection kit

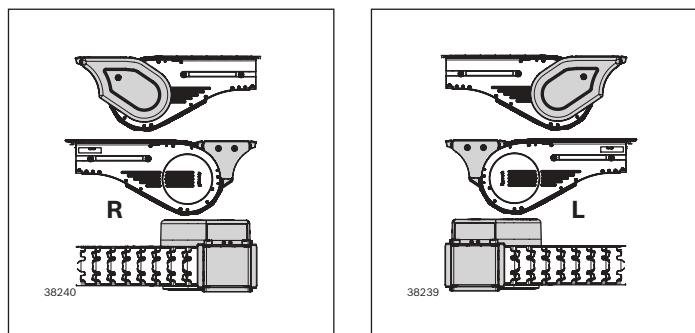
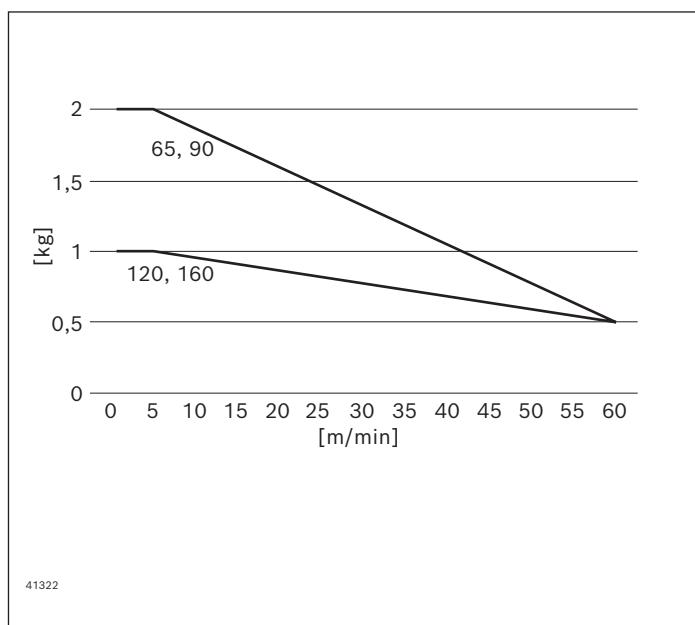
No.

VFplus 65	L	3 842 558 000
VFplus 65	R	3 842 558 001
VFplus 90	L	3 842 558 002
VFplus 90	R	3 842 558 003
VFplus 120	L	3 842 558 004
VFplus 120	R	3 842 558 005

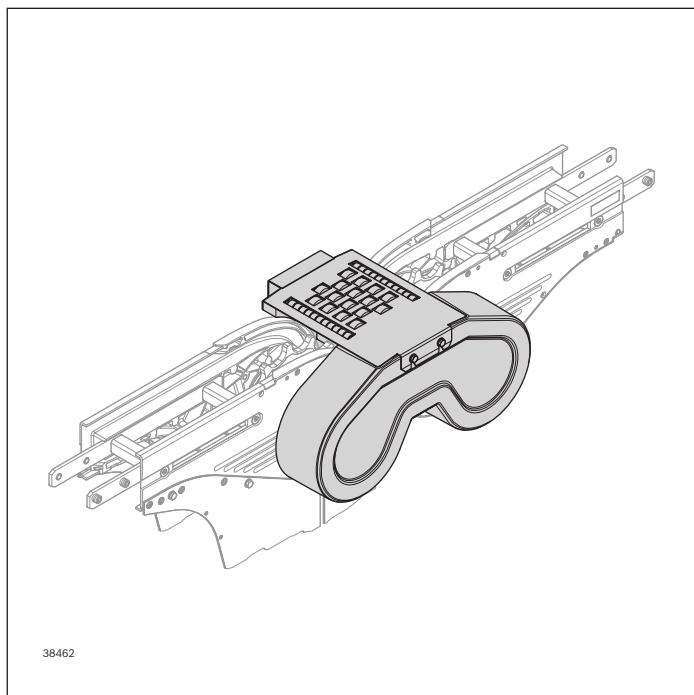
Active belt bridge connection kit for flat chain t7

No.

VFplus 160	L	3 842 558 006
VFplus 160	R	3 842 558 007


Permissible load depending on the speed


Active roller bridge connection kit



The active roller bridge is used as a transfer unit between the basic unit and return unit or with the connection drive to bridge the conveyor trench.

The active roller bridge is driven by a transmission (on the drive or return side).

- Size 65-120: Only for flat conveyor chain and static friction chain
- Size 160: Only for flat chain t7
- For dimensionally stable products with an even transport surface
- Height adjustment: approx. 2 mm
- Additional versions (e.g. machine variants at the section end) available on request
- Suitable for conveyed materials from approx. 100 mm in length (depending on the speed, position of the center of gravity, product friction, etc.)
- Freely selectable mounting position (L/R)
- Not permitted for wet operation or rough ambient conditions
- Accumulation not permitted

► Simple transmission of the drive force using hexagonal hollow shafts integrated into the base unit or return unit as standard

Scope of delivery:

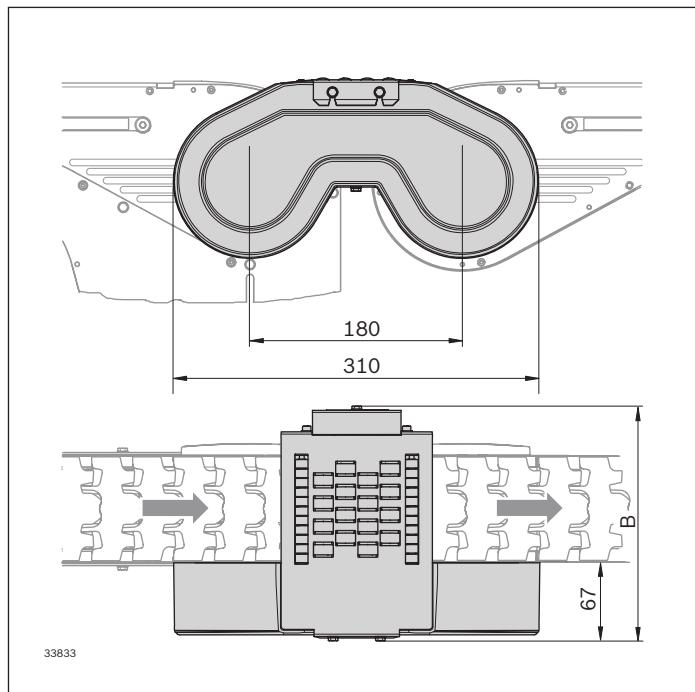
- Incl. fastening material
- Transmission and protective cover

Material:

- Non-rusting steel 1.4301, PA, POM, ABS, PUR

Condition on delivery:

- Some assembly required

**Active roller bridge connection kit****B** **No.**

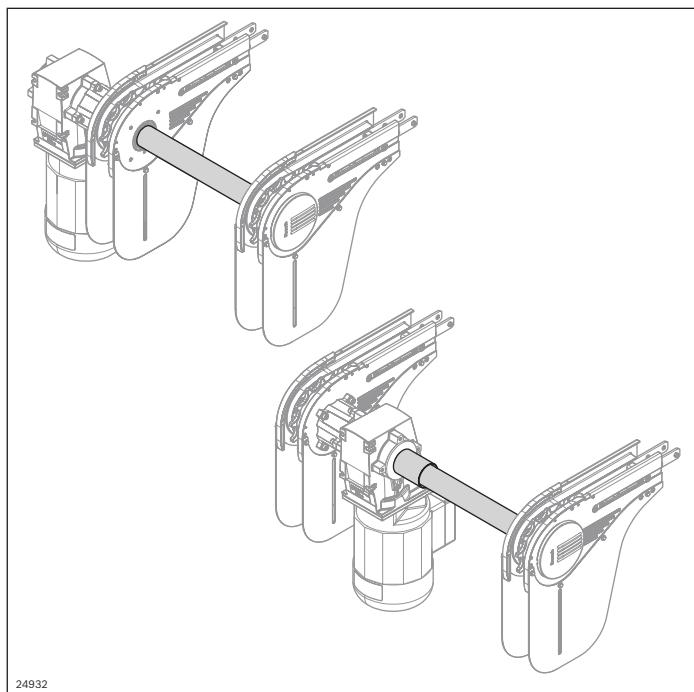
VFplus 65	174	3 842 555 820
VFplus 90	199	3 842 555 821
VFplus 120	229	3 842 555 822

Active roller bridge connection kit for flat chain t7**B** **No.**

VFplus 160	269	3 842 555 823
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Connection kit

Synchronous drive, external motor/internal motor



The connection kit for a synchronous drive is used to synchronously drive two conveyor sections with only one motor.

- Exterior synchronous drive:
 - Motor mounting position outside the parallel sections
 - Use of holders AL (see p. 121, 125)
- Internal synchronous drive:
 - Motor mounting position between the parallel sections for drive kit GM = 1 (see p. 92), customer check required for other motor types

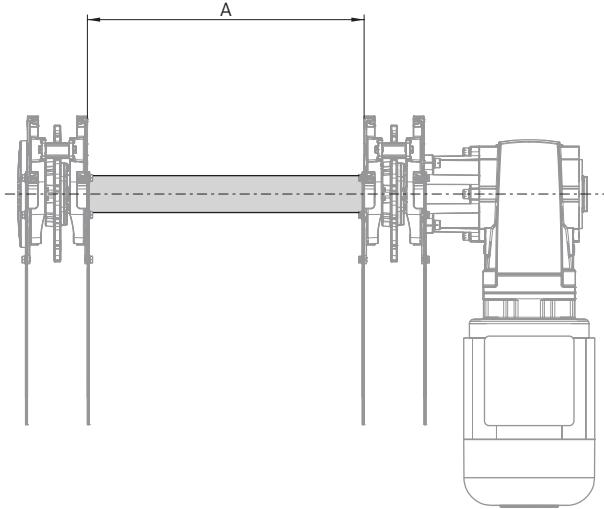
Condition on delivery:

- Assembly required

Material:

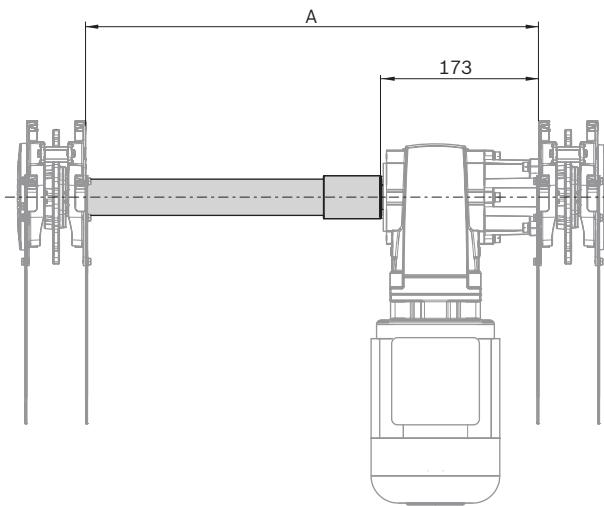
- Shaft: Non-rusting steel 1.4301
- Coupling: PA

Synchronous drive connection kit	A (mm)	No.
VFplus external motor	10 ... 2940	3 842 998 774



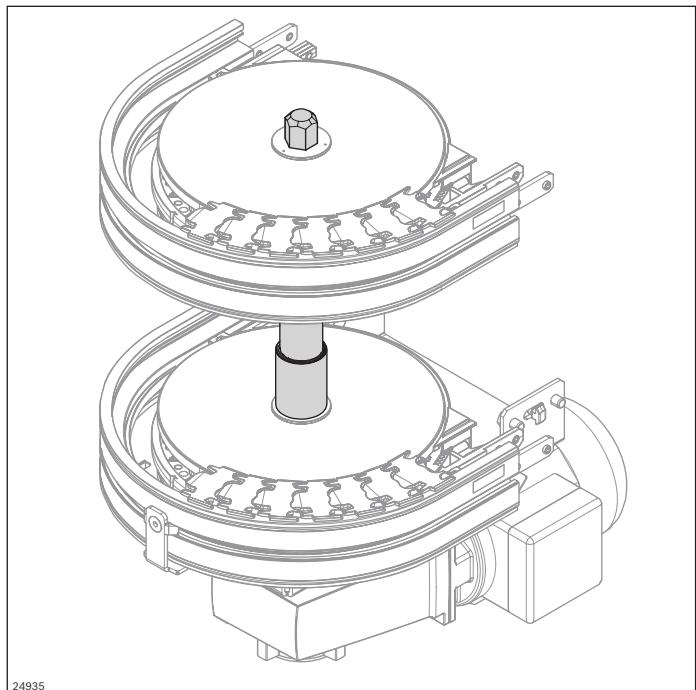
24933

Synchronous drive connection kit	A (mm)	No.
VFplus internal motor	240 ... 3160	3 842 998 775



24934

Alpine conveyor connection kit



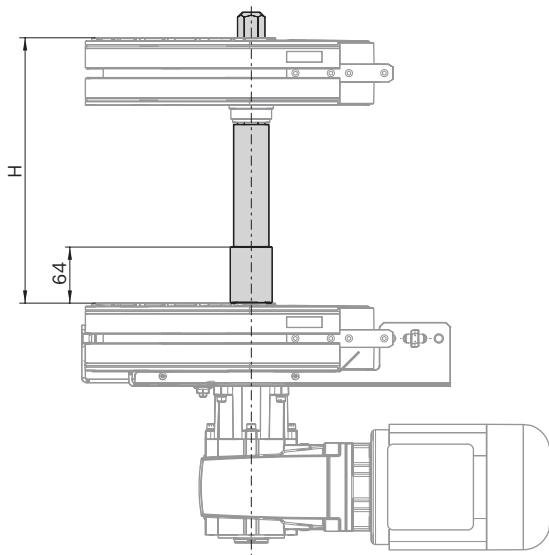
With the alpine conveyor connection kit, an alpine conveyor in the sizes 65 mm or 90 mm can be easily mounted by combining several basic units of curve wheel drive AL.

Material:

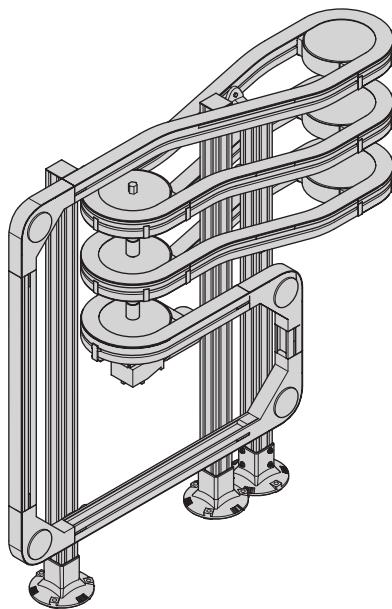
- Shaft: Non-rusting steel 1.4301
- Coupling: Polyamide

Alpine conveyor AC connection kit	H (mm)	No.
	172 ... 1000	3 842 998 776

3

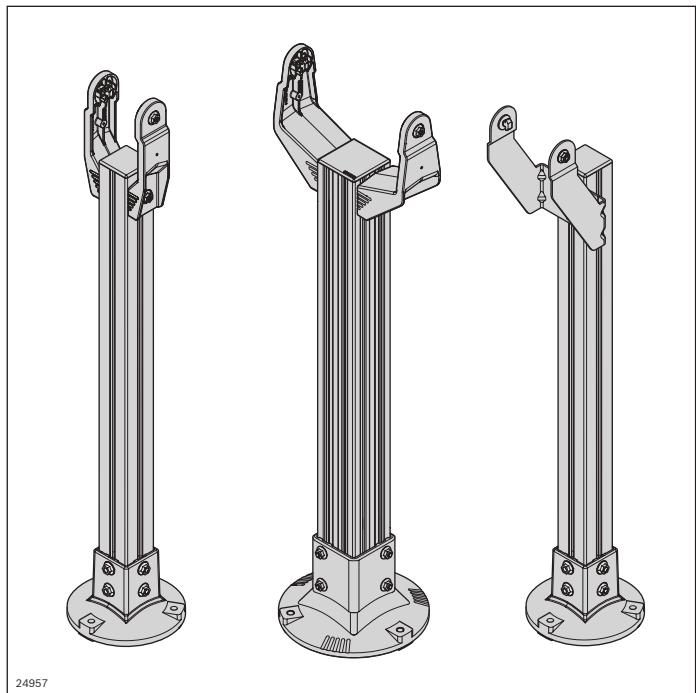


24936



33788

Leg sets AL

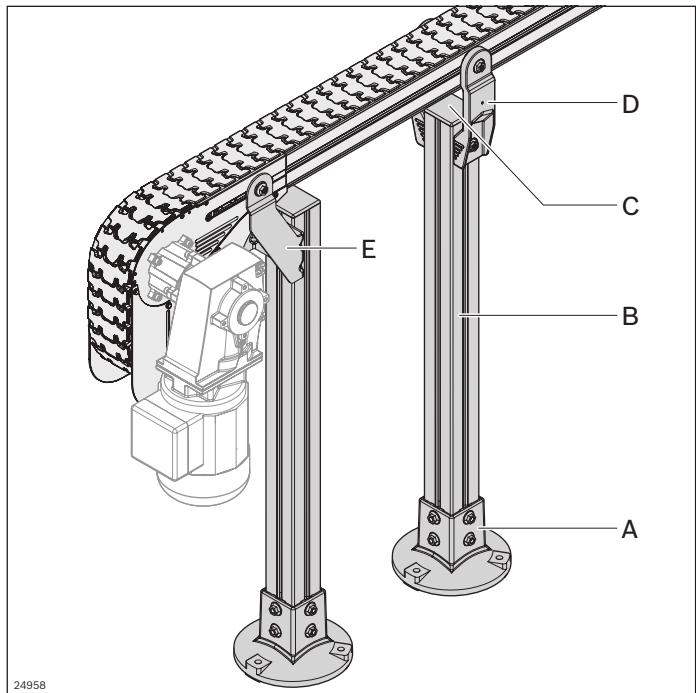


24957

- ▶ Fast, simple leg set adjustment thanks to clever product details
- ▶ Plug-through screws, few screwed connections
- ▶ Easy to clean thanks to ample draining surfaces
- ▶ Simple realization of ascending and descending conveyor sections thanks to a holder with centering lugs that can be broken off
- ▶ Drill guide for simple fastening of drip trays, safety devices, etc.
- ▶ Leg sets can also be used in conjunction with STS sections

	Leg set 65-120 AL	120
	Curve wheel drive leg set	123
	Leg set 160-320 AL	124
	Supporting bracket AL	126
	Supporting bracket, lateral AL	128

Leg set 65-120 AL



- ▶ Holder is easily centered in the slot thanks to centering lugs (**D**)
- ▶ Very simple assembly with plug-in screwed connection (**D**)
- ▶ Easy-to-clean design with draining surfaces

Optional accessories:

- Dowel, washer, see p. 122

Alternative feet (see MGE catalog, "Feet and wheels" section)

Scope of delivery:

- **A, E:** Incl. fastening material
- **D:** Set (2 pcs) incl. fastening material

The chain conveyor is placed on the ground by means of supports (and fastened) or even suspended from the ceiling. The suspension is determined by the application. The floor supports for sizes 65, 90 and 120 are constructed from the following single parts: Foot 60x60 (**A**), strut profile 60x60 (**B**), cover cap (**C**), holder for attaching the section profiles (**D**) 65, 90 or 120. A separate holder (**E**) is used to support the motors / drives.

- Depending on the speed, accumulation behavior and weight, the leg sets are to be fixed at a distance of approx. 2 ... 3 m
- The leg sets for the stainless steel system (see p. 190) may also be used for the aluminum system
- The holder (**E**) may only be used for AL systems
- The height adjustment range is up to 79 mm (**D**), depending on the return chain, see "Holder adjustment range" p. 122
- The holder (**D**) can also be used for ascending and descending conveyor sections (up to approx. 45°, depending on the return chain) by removing the centering lugs
- Holder (**D**) with drill guide for additional holes to fasten drip trays, trap guards for return chains, etc.
- For a conductive connection, the contact washers must be mounted between the flange nuts or the washers and coated accessories (holders, ...) in order to break through the coating (see p. 122)

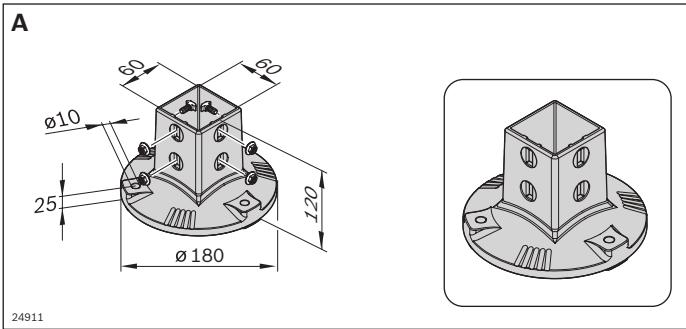
See also "Setting up leg sets for ESD systems", page 212.

Condition on delivery:

- Assembly required

Material:

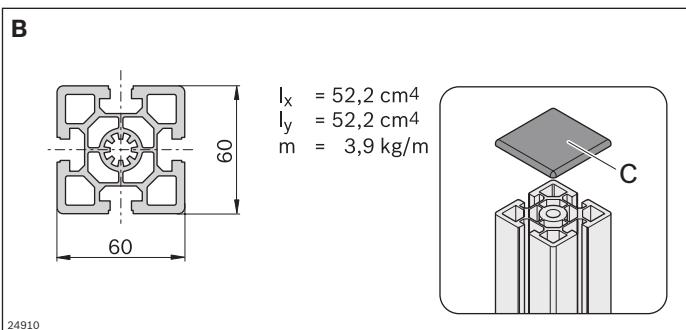
- **A, D:** Diecast aluminum; silver
- **B:** Aluminum; natural, anodized
- **C:** PA; black
- **E:** Steel; zinc-plated

**Foot AL**

VFplus 60x60

No.

1 3 842 544 875

**Strut profile AL 60x60**

L (mm)

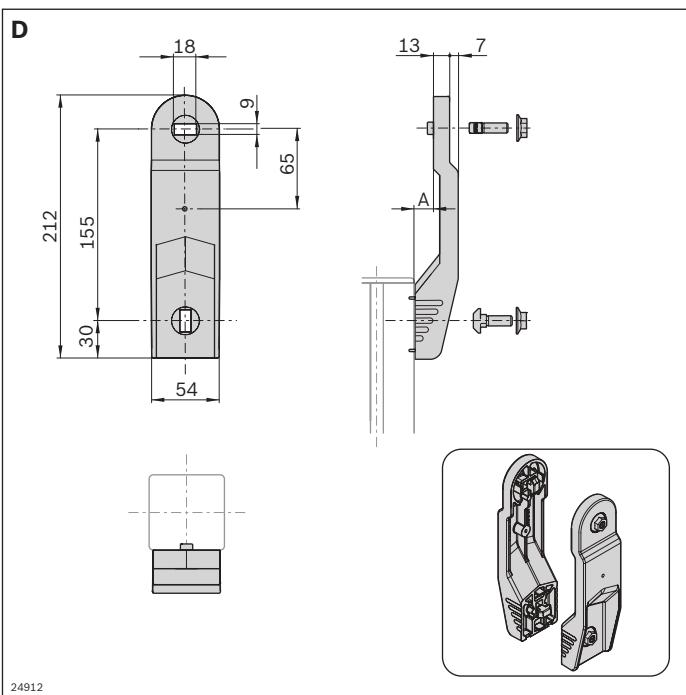
No.

20 pcs

6070 3 842 557 202

1 pc

50 ... 6070 3 842 990 350/L

**Cover cap**

VFplus 60x60, signal gray

No.

100 3 842 548 808

Holder AL

VFplus 65

b (mm)

65

A (mm)

2.5

Set

No.

3 842 546 625

VFplus 90

90

15

Set

3 842 546 626

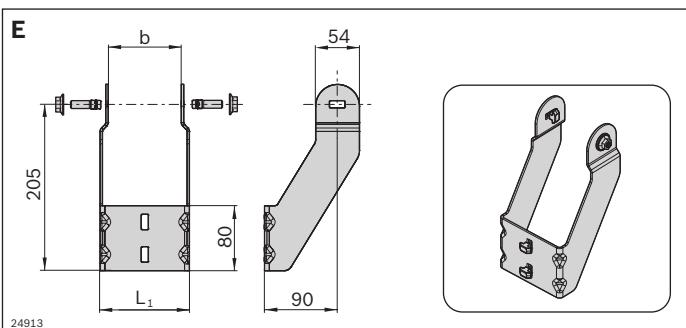
VFplus 120

120

30

Set

3 842 546 627

**Holder motor leg set AL**

VFplus 65

b (mm)

65

L1 (mm)

85

Set

No.

3 842 547 442

VFplus 90

90

110

Set

3 842 547 443

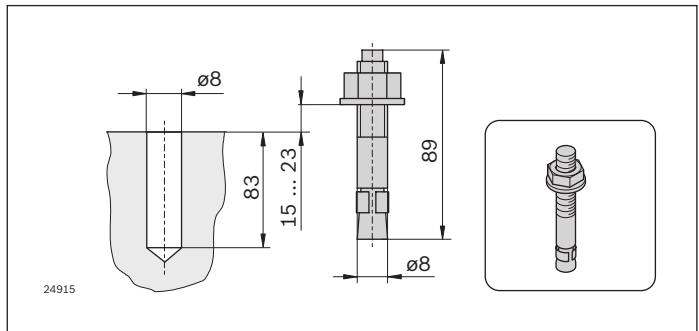
VFplus 120

120

140

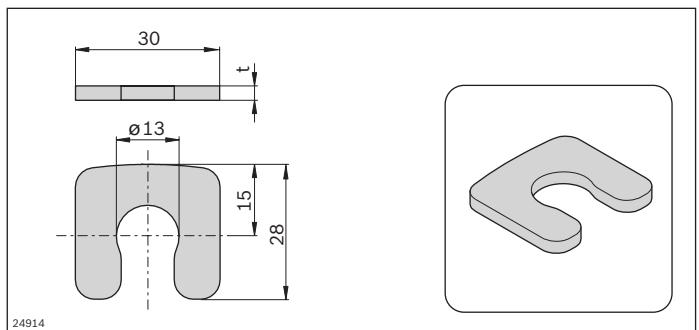
Set

3 842 547 444



Dowel

	No.
100	3 842 540 668



Washer

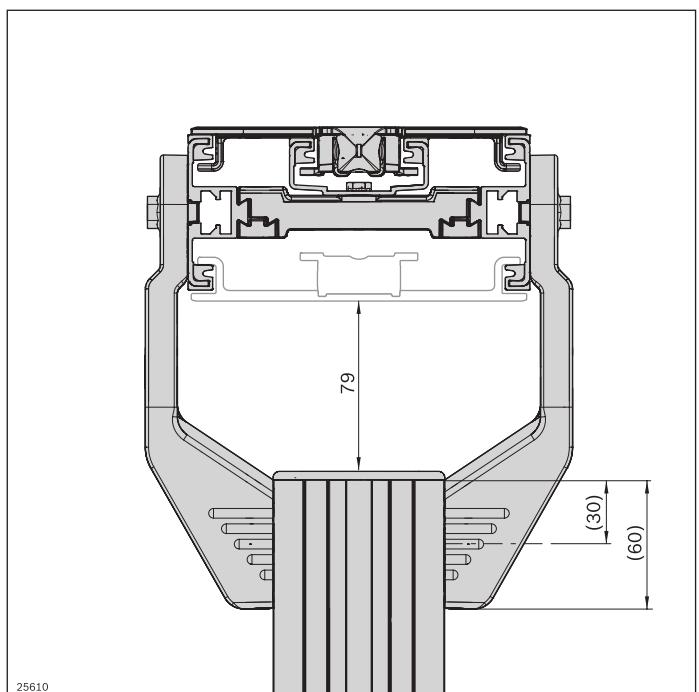
	t (mm)	No.
1	100	3 842 546 717
3	20	3 842 546 718



Establishing a conductive connection between coated metal parts

Contact washer M8

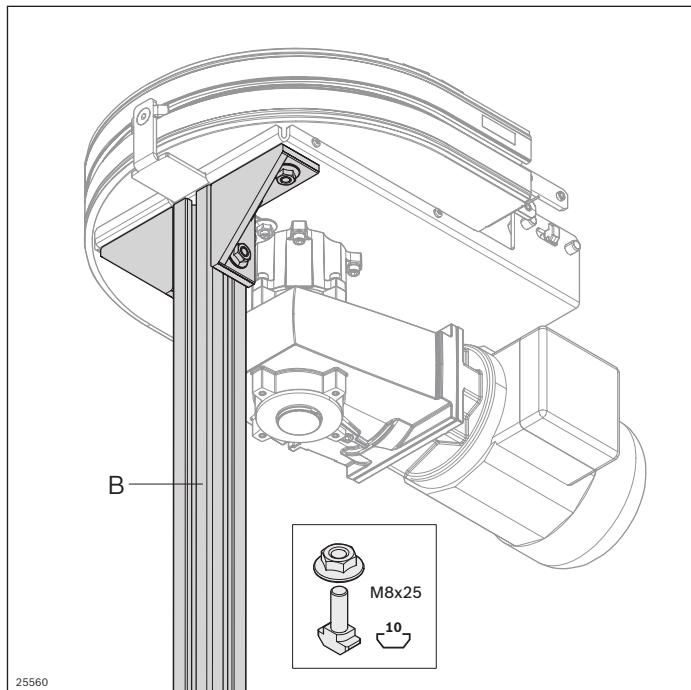
	No.
100	3 842 571 621



Holder adjustment range

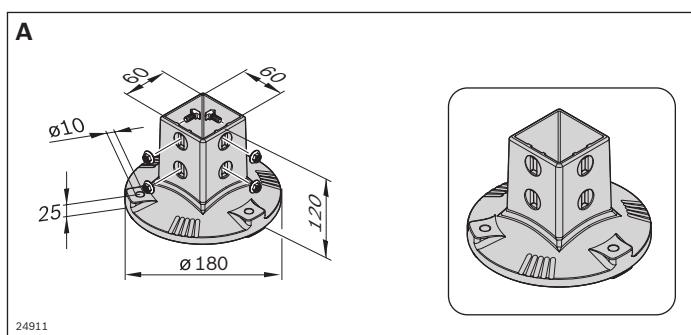
The aluminum holder adjustment range shown relates to the standard installation position (holder flush with the profile end) and the use of a flat chain for horizontal running of the chain. For vertical use, the adjustment range is reduced depending on the angle.

Curve wheel drive leg set

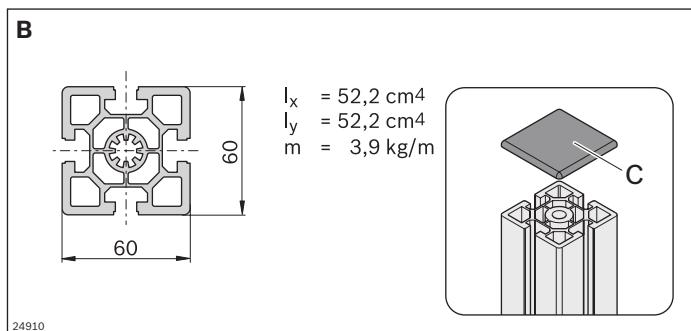


Bracket 40/80	Slot	ESD	No.
Set (standard)	10 / 10	▲	1 3 842 529 386
designLINE set	10 / 10	▲	1 3 842 551 604

For a conductive connection, the contact washers must be mounted between the flange nuts or the washers and coated accessories (holders, ...) in order to break through the coating.



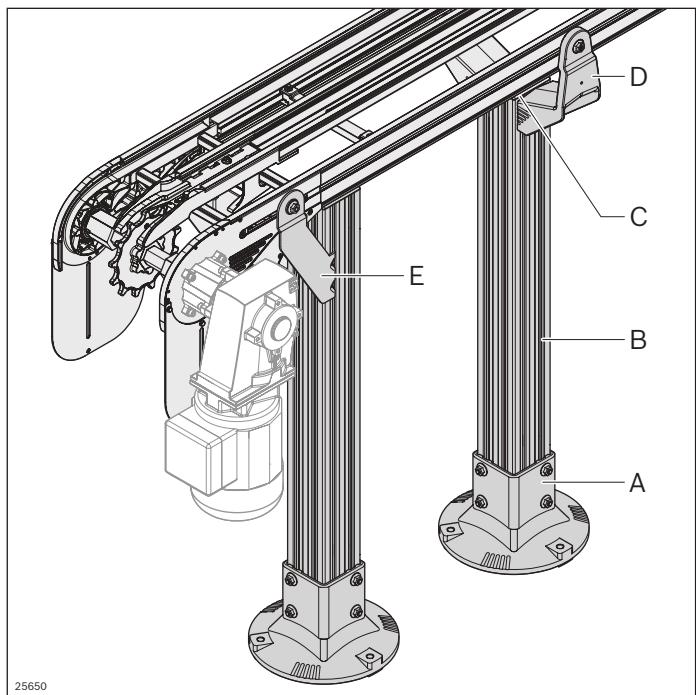
Foot AL	No.
VFplus 60x60	1 3 842 544 875



Strut profile AL 60x60	L (mm)	No.
20 pcs	6070	3 842 557 202
1 pc	50 ... 6070	3 842 990 350/L

Cover cap	No.
VFplus 60x60, signal gray	100 3 842 548 810

Leg set 160-320 AL



- ▶ Holder is easily centered in the slot thanks to centering lugs (D)
- ▶ Very simple assembly with plug-in screwed connection (D)
- ▶ Easy-to-clean design with draining surfaces

Optional accessories:

- Dowel, washer, see p. 122

Alternative feet (see MGE catalog, "Feet and wheels" section)

Scope of delivery:

- **A, E:** Incl. fastening material
- **D:** Set (2 pcs) incl. fastening material

The chain conveyor is placed on the ground by means of supports (and fastened) or even suspended from the ceiling. The suspension is determined by the application. The floor supports for sizes 160, 240 and 320 are constructed from the following individual parts: Foot 80x80 (A), strut profile 80x80L (B), cover cap (C), holder for attaching the section profiles (D) 160, 240 or 320.

A separate holder (E) is used to support the motors/drives

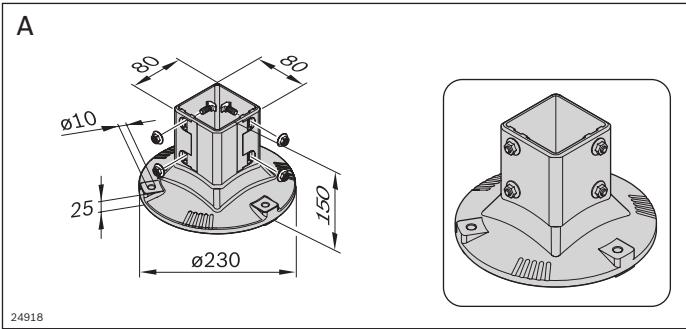
- Depending on the speed, accumulation behavior and weight, the leg sets are to be fixed at a distance of approx. 2 ... 3 m
- The leg sets for the stainless steel system (see p. 190) may also be used for the aluminum system
- The holder (E) may only be used for AL systems
- The height adjustment range is up to 79 mm (D), depending on the return chain, see p. 122
- The holder (D) can also be used for ascending and descending conveyor sections (up to approx. 45°, depending on the return chain) by removing the centering lugs
- Holder (D) with drill guide for additional holes to fasten drip trays, trap guards for return chains, etc.
- For a conductive connection, the contact washers must be mounted between the flange nuts or the washers and coated accessories (holders, ...) in order to break through the coating (see p. 122)

Condition on delivery:

- Assembly required

Material:

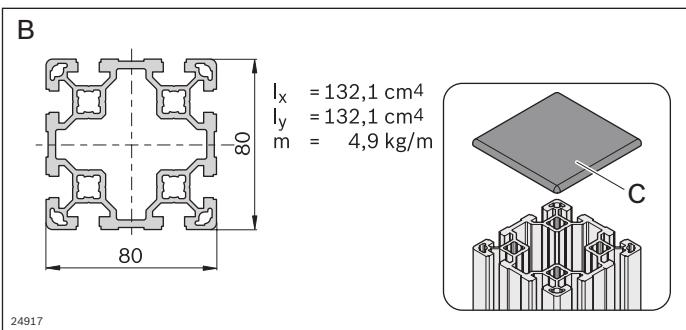
- **A, D:** Diecast aluminum; silver
- **B:** Aluminum; natural, anodized
- **C:** PA; black
- **E:** Steel; zinc-plated

**Foot AL**

No.

VFplus 80x80

1 3 842 540 173

**Strut profile AL 80x80 L**

L (mm)

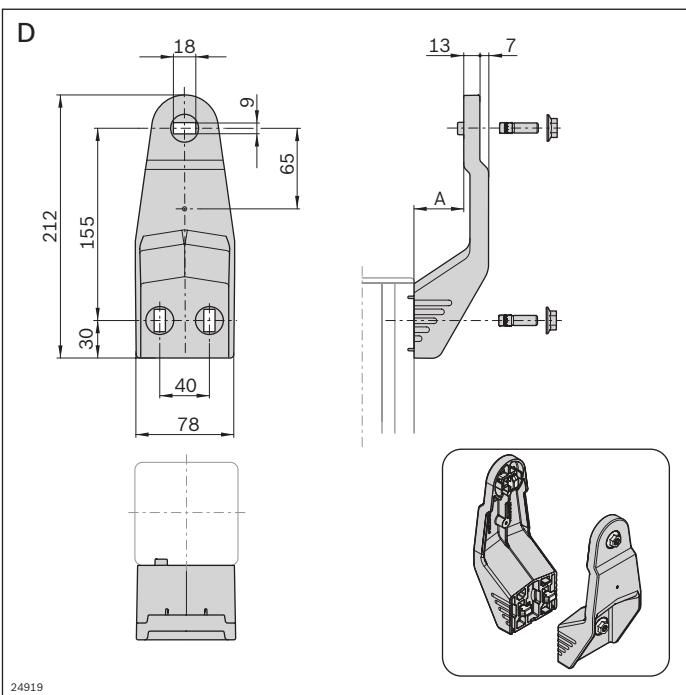
6 pcs	6070	3 842 529 347
1 pc	50 ... 6000	3 842 993 133/L

Cover cap

No.

VFplus 80x80, signal gray

20 3 842 548 750

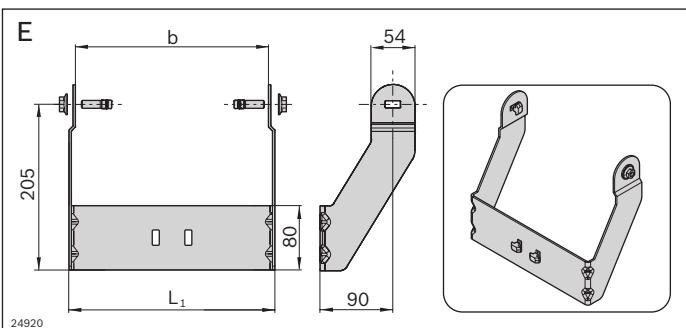
**Holder AL**

b (mm)

A (mm)

No.

VFplus 160	160	40	Set	3 842 546 628
VFplus 240	240	80	Set	3 842 546 629
VFplus 320	320	120	Set	3 842 546 630

**Holder motor leg set AL**

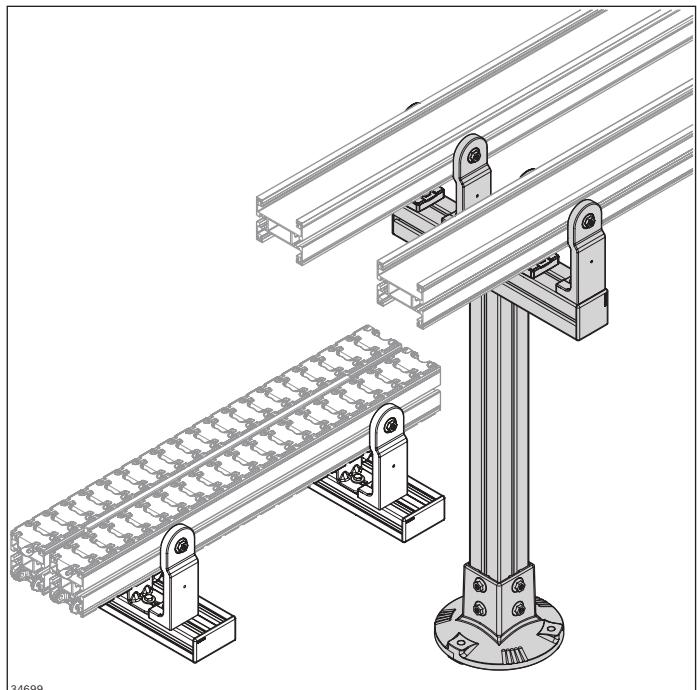
b (mm)

L₁ (mm)

No.

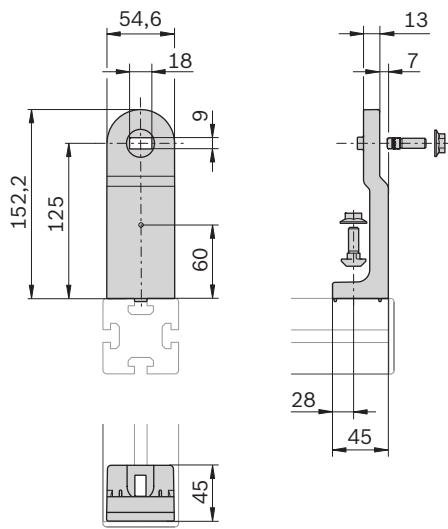
VFplus 160	160	180	Set	3 842 547 445
VFplus 240	240	260	Set	3 842 547 446
VFplus 320	320	340	Set	3 842 547 447

Supporting bracket AL



Several parallel sections can be assembled on a horizontal profile with the supporting bracket.

- The distance of the supporting bracket in the conveying direction is approx. 2-3 m, depending on the speed, accumulation behavior and weight
- The supporting brackets can also be used for ascending and descending conveyor sections (up to about 45°, depending on the returning chain) (with the supporting bracket AL, the centering lugs must be removed)
- For a conductive connection, the contact washers must be mounted between the flange nuts or the washers and coated accessories (holders, ...) in order to break through the coating (see p. 122)
- Very simple assembly thanks to pluggable screwed connection
- The supporting brackets are fastened on a horizontal strut profile

**Supporting bracket VFplus AL**

No.

Set **3 842 546 632**

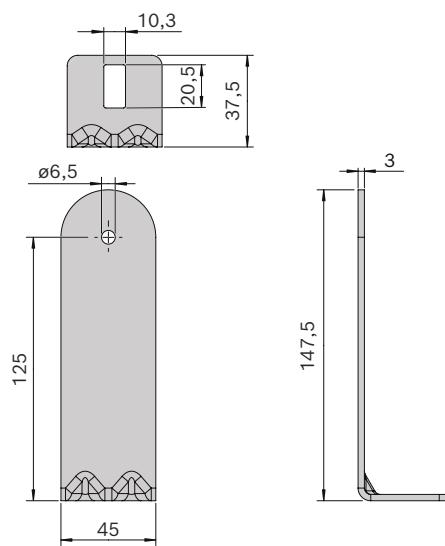
- ▶ Supporting bracket is easily centered in the slot thanks to centering lugs
- ▶ Easy-to-clean design with draining surfaces

Scope of delivery:

- Set (2 pcs) incl. fastening material

Material:

- Diecast aluminum; silver

**Supporting bracket VFplus STS 10 mm**

No.

Set **3 842 571 257**

- ▶ Space-saving supporting bracket for realizing parallel sections with narrow track distances

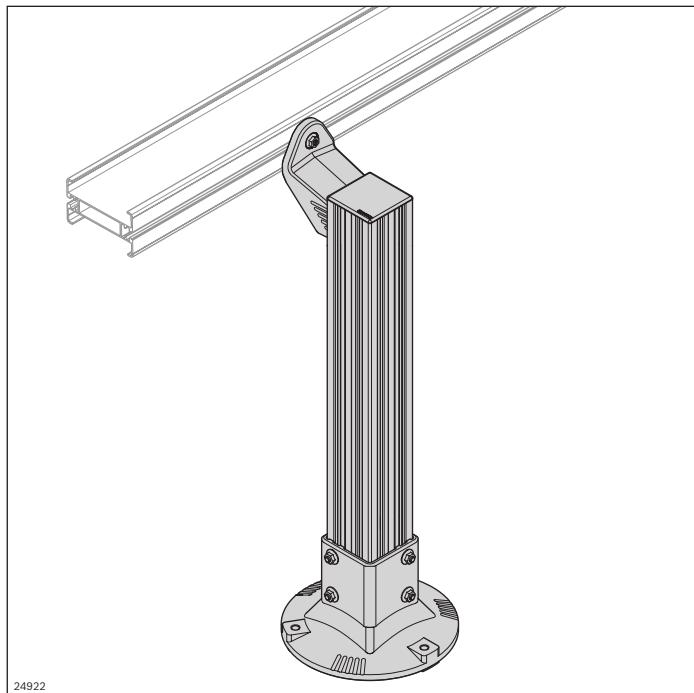
Scope of delivery:

- Set (1 pc) incl. fastening material

Material:

- Non-rusting steel 1.4301

Supporting bracket, lateral AL



The lateral supporting bracket is for mounting on a vertical strut profile 80x80. It is suitable for the construction of an alpine conveyor, for example.

- In the case of one-sided attachment, the lateral supporting bracket is only permitted for sizes up to 120
- The lateral supporting bracket can also be used for ascending and descending conveyor sections (up to approx. 45°) by removing the centering lugs
- For a conductive connection, the contact washers must be mounted between the flange nuts or the washers and coated accessories (holders, ...) in order to break through the coating (see p. 122)

- ▶ Supporting bracket is easily centered in the slot thanks to centering lugs
- ▶ Very simple assembly thanks to pluggable screwed connection

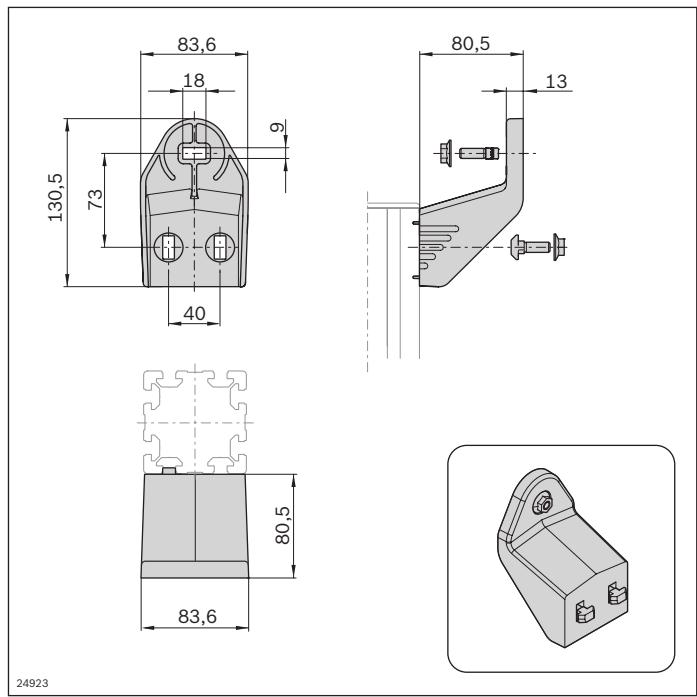
Scope of delivery:

- Set (1 pc) incl. fastening material

Material:

- Diecast aluminum; silver

- ▶ Easy-to-clean design with draining surfaces

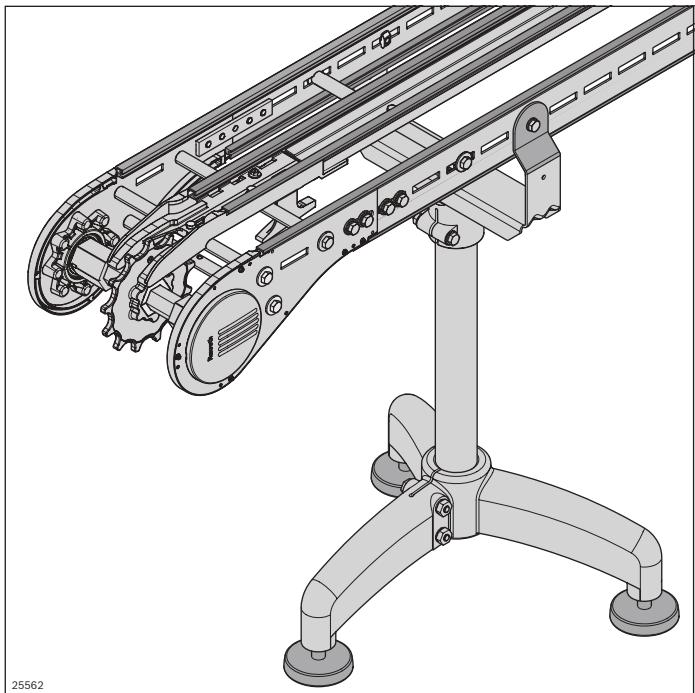


Supporting bracket VFplus lateral AL

 No.

Set 3 842 547 461

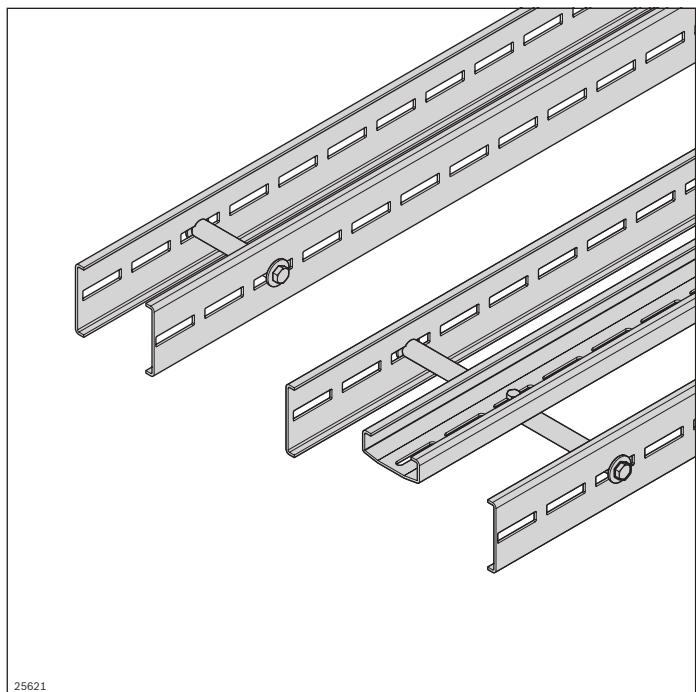
VarioFlow plus Stainless steel system (STS)



- ▶ FDA-compliant materials and easy-to-clean surfaces fulfill the high standards in the areas of the food & packaging and health & care industries where hygiene is crucial
- ▶ Mounting of sliding rails without rivets or the need to machine the track bearing surfaces
- ▶ Minimal sliding rail interruptions
- ▶ FDA-compliant, low-friction materials for components subject to constant friction
- ▶ Standardized components that can be used universally
- ▶ Continuous product range in the sizes 65, 90, 120, 160, 240, 320

	Sections STS	132
	Curves STS	144
	Drive and return unit STS	154
	Leg sets STS	188

Sections STS



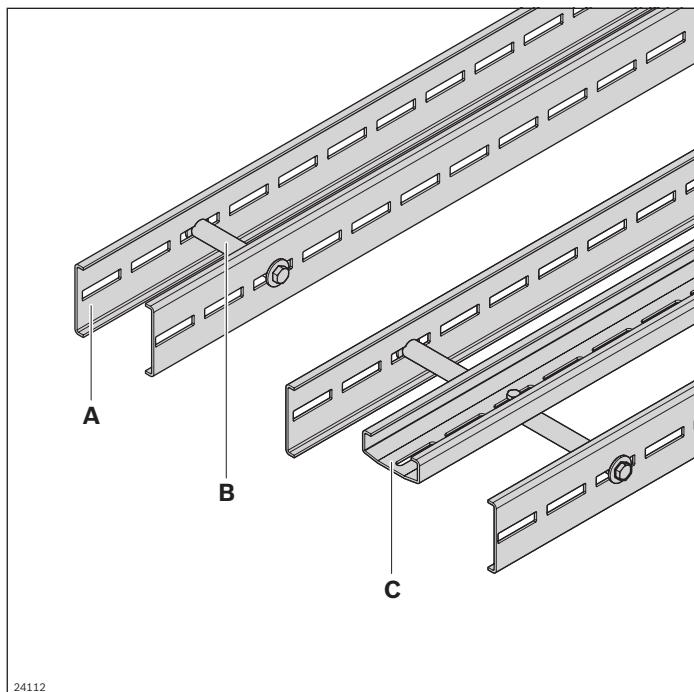
- ▶ Easy-to-clean sections due to largely media-resistant components
- ▶ Mounting of sliding rails without rivets or the need to machine the track bearing surfaces
- ▶ Sliding rails with optimized anti-friction properties and FDA-compliant materials
- ▶ One sliding rail cross-section for all sizes
- ▶ Few screwed connections
- ▶ One profile cross-section for all sizes
- ▶ Use of a support profile from size 160

	Section profile STS open	134
	Section profile STS Clean	136
	Sliding rail	138
	Steel sliding rail	140
	Profile connector STS	142
	Assembly module STS	143

Section profile STS open

Cross connector STS

Support profile STS



The open construction of the section profile (A) allows dirt or foreign particles to be removed directly.

To build a conveyor section, 2 open section profiles are required, which are connected by cross connectors.

A support profile is necessary for sizes 160 and up.

- Same profile cross-section across all sizes (65-320)

The cross connector (B) is the connection of two profile halves to make an open section profile. The size is determined by using cross connectors of different lengths.

From size 160, a support profile (C) is required.

The support profile is attached to the existing cross connectors.

STS open section profile (A)

- Elongated holes for attaching a drive/return unit, curves, lateral guides, leg sets, or other accessories
- Simple to clean

STS cross connector (B)

- Cross connector with mounting option for support profile

Required accessories:

- **A:** Sliding rail, see p. 138; profile connector, see p. 142; cross connector, see p. 134; support profile from size 160, see p. 134

Scope of delivery:

- **B:** Incl. fastening material

STS support profile (C)

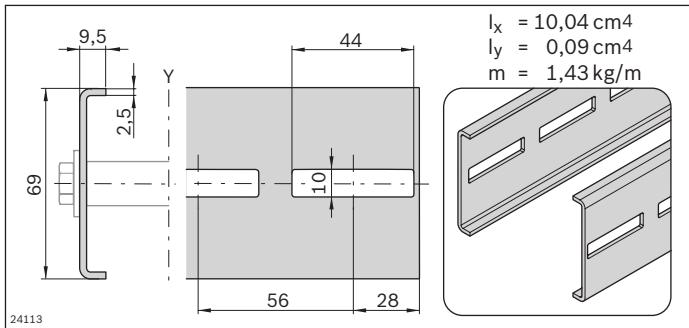
- With elongated holes for fastening in regular intervals
- Plug-through stainless steel T-nuts as mounting option on the section profile

Material:

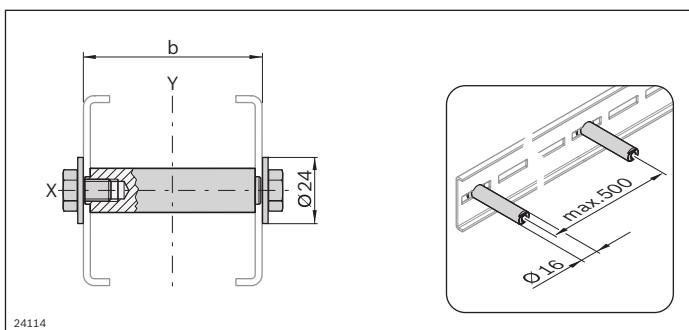
- **A, B, C:** Non-rusting steel 1.4301

Condition on delivery:

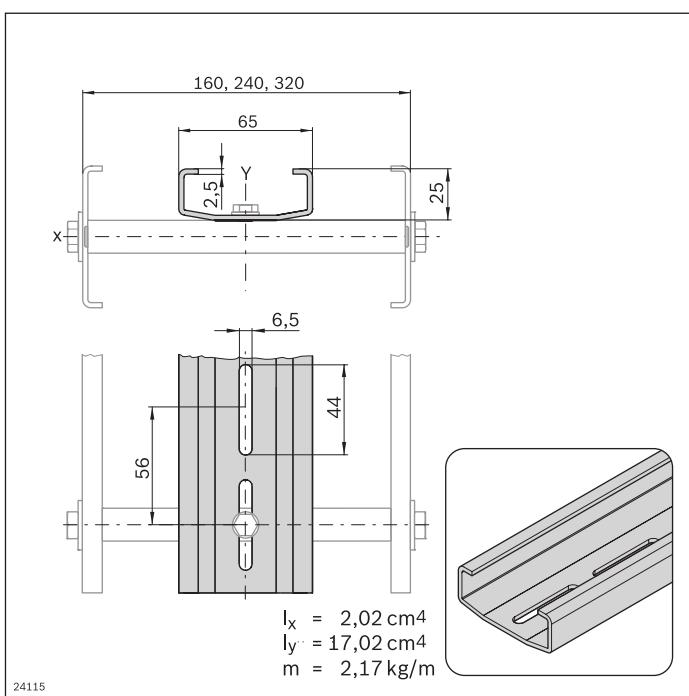
- **A, B:** Assembly required



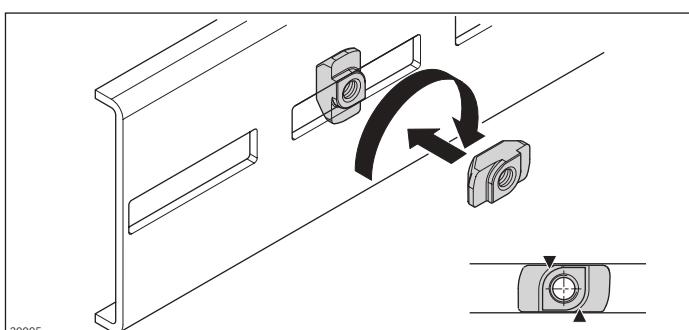
Section profile VFplus STS open	L (mm)	No.
 12 pcs	3024	3 842 546 649
 2 pcs	3024	3 842 547 905
1 pc	75 ... 3000	3 842 996 027/L



Cross connector STS	b (mm)		No.
VFplus 65 STS	65	10	3 842 546 684
VFplus 90 STS	90	10	3 842 546 685
VFplus 120 STS	120	10	3 842 546 686
VFplus 160 STS	160	10	3 842 546 687
VFplus 240 STS	240	10	3 842 546 688
VFplus 320 STS	320	10	3 842 546 689



Support profile VFplus STS	L (mm)	No.
 12 pcs	3024	3 842 546 700
1 pc	3024	3 842 547 906
1 pc	75 ... 3000	3 842 996 029/L

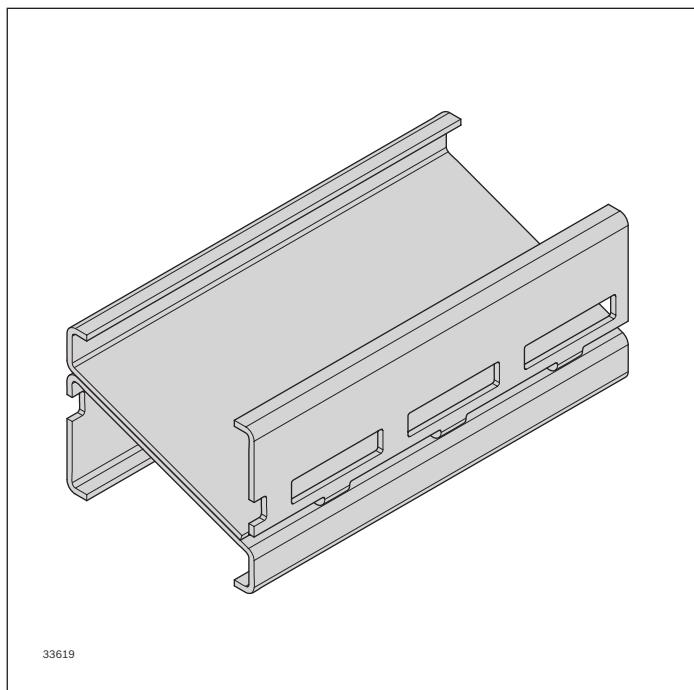


Standard element for the secure connection of accessory parts to the section profile

Notice: MGE T-nuts do not fit in the STS section profile.

T-nut	 No.
VFplus STS M6	20 3 842 546 706
VFplus STS M8	20 3 842 546 707

Section profile STS Clean



The construction of the STS Clean section profile allows for the direct discharge of dirt or foreign particles without them reaching the returning chain.

- Size: 90
- For use in harsh production environments

Notice: Not compatible with the AL system.

- ▶ Elongated holes for attaching a drive/return unit, curves, lateral guides, supports and other accessories
- ▶ Simple to clean

Required accessories:

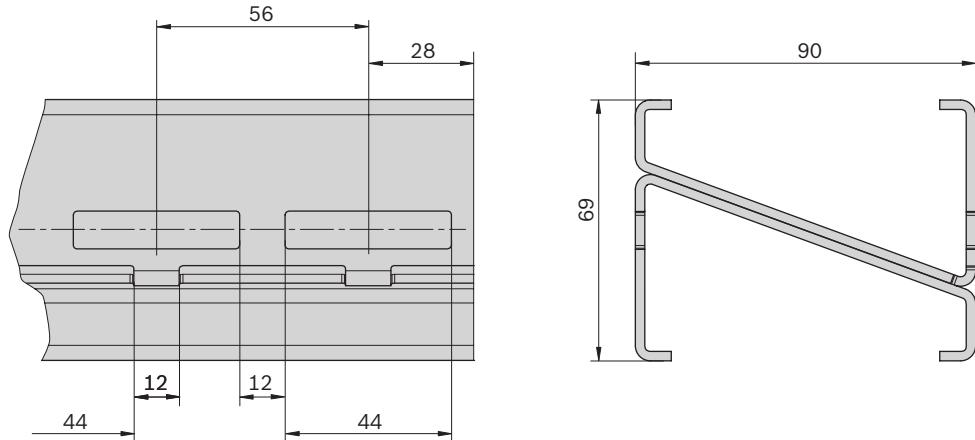
- Profile connector STS Clean Section, see p. 137
- Sliding rail, see p. 138

Material:

- Non-rusting steel 1.4301

Optional accessories:

- T-nut VFplus STS, see p. 135

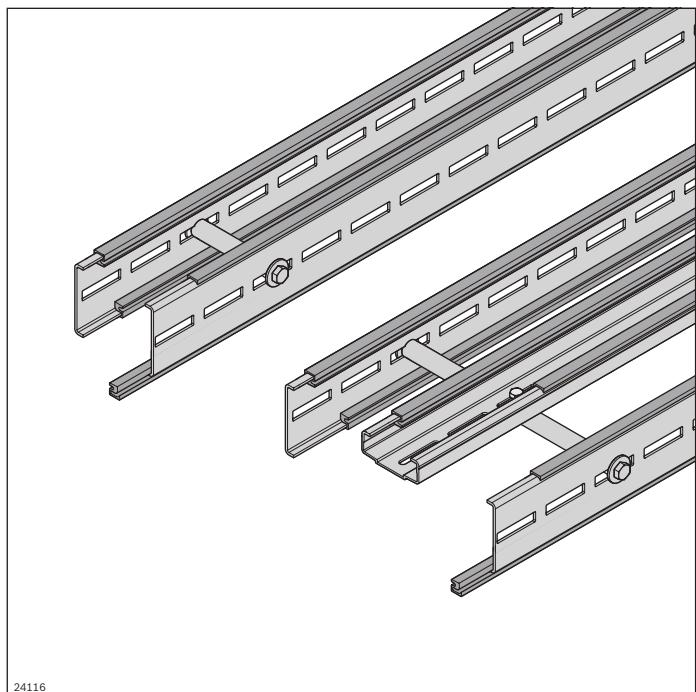


33620

Section profile STS Clean	L (mm)		No.
	3024	1	3 842 553 006
	75 ... 3000	1	3 842 996 314
Profile connector STS Clean Section	H (mm)		No.
	17	10	3 842 552 927

Notice: When using the section profile STS Clean with the basic units (head drive, return unit, connection drive), the enclosed profile connector (H = 20 mm) must be replaced with the profile connector STS Clean Section (H = 17 mm)
3 842 552 927.

Sliding rail



- ▶ Easy assembly - simply clip onto the section profile
- ▶ Secured against axial shifting with lateral screw fittings
- ▶ Gliding surface machining: not required
- ▶ Material
 - with Premium, Advanced sliding rail: FDA CFR 21
 - with Basic sliding rail: EU 10/2011, FDA CFR 21
- ▶ One cross-section for all AL and STS section profiles

Required accessories:

- Sliding rail assembly tool, see p. 300
- Oval-head screw 2.9x9.5 DIN 7981; DIN EN ISO 7049
see p. 139, 1 screw for each sliding rail section

Material:

- PE-UHMW

The sliding rail is clipped into the section profile and guides the conveyor chain.

Lateral securing means the sliding surface does not need to be machined. Wear and noise level are thus reduced to a minimum.

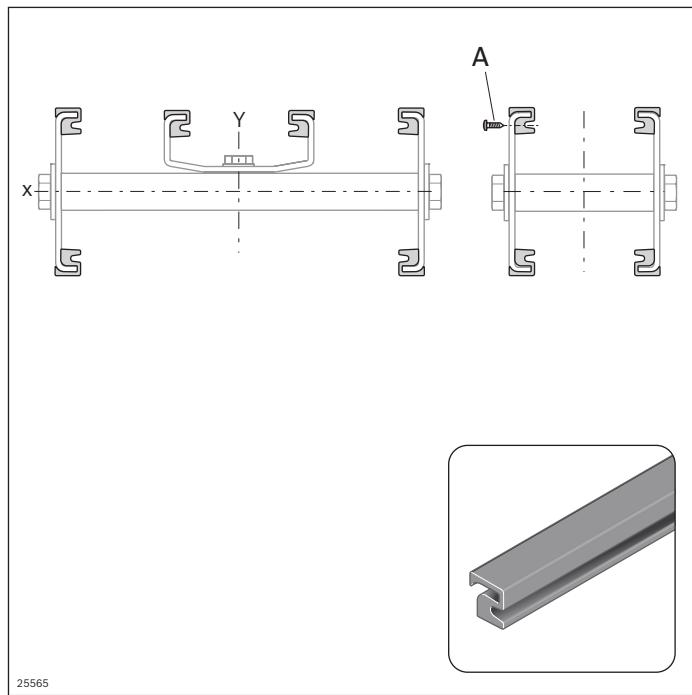
Three sliding rails with different main areas of application are available:

- Basic: straight sections and curve wheels, v_{max} 60 m/min
- Advanced: Sections with sliding curves, v_{max} 60 m/min, clean room
- Premium: Sections with sliding curves, v_{max} 120 m/min, clean room

For the selection of sliding rails, see the "Technical data" chapter on page 312. See also sliding rails ESD on page 200 and steel sliding rail on page 140.

Extend the sliding rail over the component interfaces to ensure minimum wear and noise emissions. Interruptions to the profile or component connection must be avoided. If an interruption is necessary after 10 m, the sliding rail must be attached laterally with a sheet metal screw (A).

Notice: After the sliding curves, an interruption is provided as an expansion joint in the inner curve area.

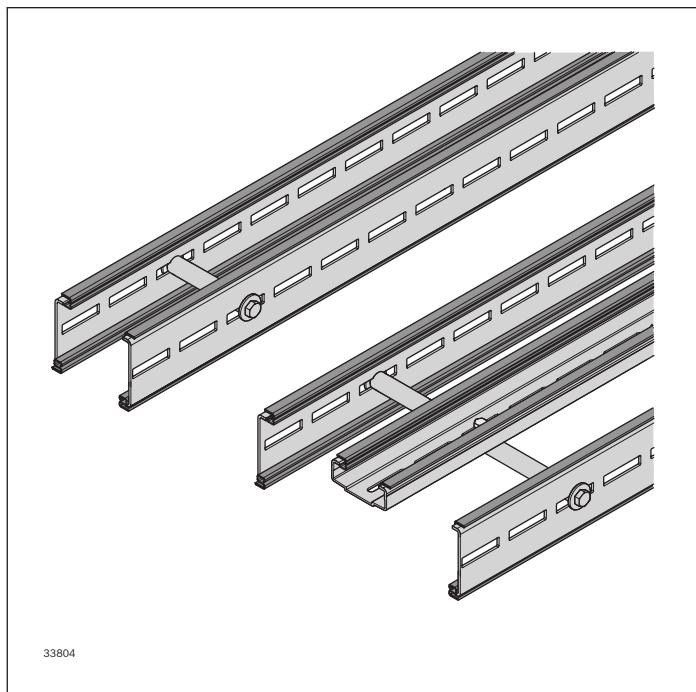


Sliding rail VFplus	Color	L (mm)	No.
Premium	gray	30000	1 3 842 546 116
Advanced	white	30000	1 3 842 549 727
Basic	blue	30000	1 3 842 549 730

See also sliding rail ESD, see p. 200
and steel sliding rail, see p. 140.

Oval-head screw	No.
A	100 3 842 533 915

Steel sliding rail



- ▶ Easy assembly - simply clip onto the section profile
- ▶ Secured against axial shifting via lateral fixing
- ▶ Gliding surface machining: not required
- ▶ One cross-section for all AL and STS section profiles

Required accessories:

- Pop rivet D3x8 mm, see p. 141
- Number of rivets:
 - Straight sliding rail section: 1 rivet
 - 30°/45° curves: 2 rivets
 - 90° curve: 3 rivets
 - 180° curve: 6 rivets

Material:

- Non-rusting steel 1.4301

The steel sliding rail is suitable for use in abrasive ambient conditions (reduced service life of the conveyor chain). It is clipped in to the section profile and fixed in place at the side via a pop rivet.

The side fixing reduces the friction and the noise level to a minimum. The steel sliding rail butt joints are merely chamfered. The Advanced sliding rail is used in the lower run of the curve wheels.

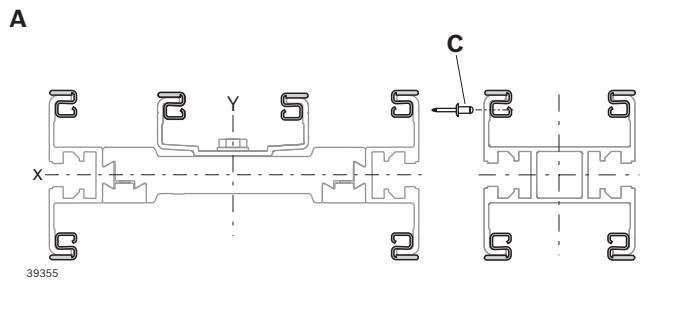
- Steel sliding rail straight section (**A**), not bendable
- Steel sliding rail curve wheels (**B**) 30°, 45°, 90°, 180°
- Dry, wet and abrasive environment
- Size:
 - Straight section: all track widths
 - Curve wheel 65, 90, 120
- Not suitable for use in horizontal sliding curves
- Only Advanced or Premium sliding rails can be used in vertical curves

For the selection of sliding rails, see the "Technical data" chapter on page 312.

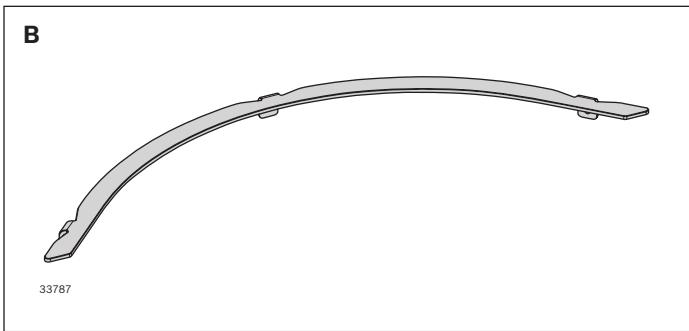
Notice: Ensure gap-free assembly (without expansion joint), as foreign bodies could otherwise get trapped in the gap and damage the chain.

Notice: Non-destructive dismantling of the steel sliding rail is not possible. A target separation point of the system must therefore be defined before assembly. Overlap the steel sliding rail by 10 ... 15 mm on the section profile separation point. This ensures that it is still possible to pull apart the two parts.

Extend the steel sliding rail over the component interfaces to ensure minimum wear and reduced noise emissions. Interruptions directly on the profile or component connection must be avoided.



Sliding rail VFplus Steel	L (mm)	No.
A Straight section	3000	1 3 842 552 970
Pop rivet D3x8mm		No.
C	100	100 3 842 557 004



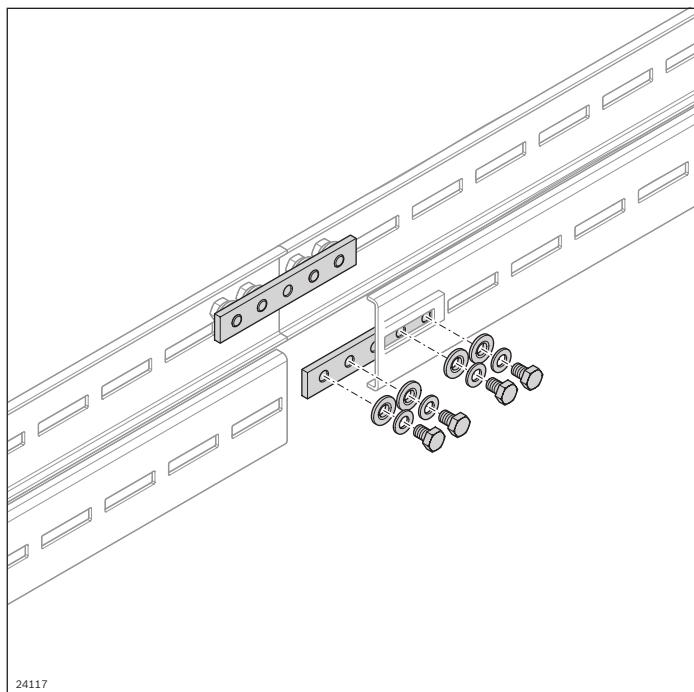
Steel sliding rail; curve wheel VFplus 65	No.
B Steel 30°	1 3 842 557 030
B Steel 45°	1 3 842 557 031
B Steel 90°	1 3 842 552 972
B Steel 180°	1 3 842 552 973

Steel sliding rail; curve wheel VFplus 90	No.
B Steel 30°	1 3 842 557 032
B Steel 45°	1 3 842 557 033
B Steel 90°	1 3 842 552 974
B Steel 180°	1 3 842 552 975

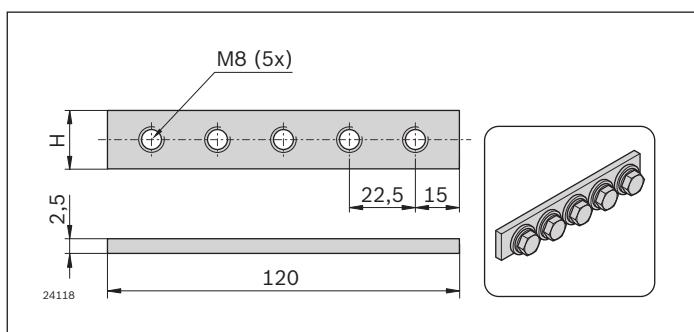
Steel sliding rail; curve wheel VFplus 120	No.
B Steel 30°	1 3 842 557 034
B Steel 45°	1 3 842 557 035
B Steel 90°	1 3 842 557 036
B Steel 180°	1 3 842 557 037

Pop rivet D3x8mm	No.
C	100 3 842 557 004

Profile connector STS



Two profile connectors are used to connect the end faces of the section profiles



Profile connector VFplus STS	H (mm)		No.
	20	10	3 842 547 895
<hr/>			
Profile connector STS Clean Section	H (mm)		No.
	17	10	3 842 552 927
<hr/>			

Scope of delivery:

- Complete

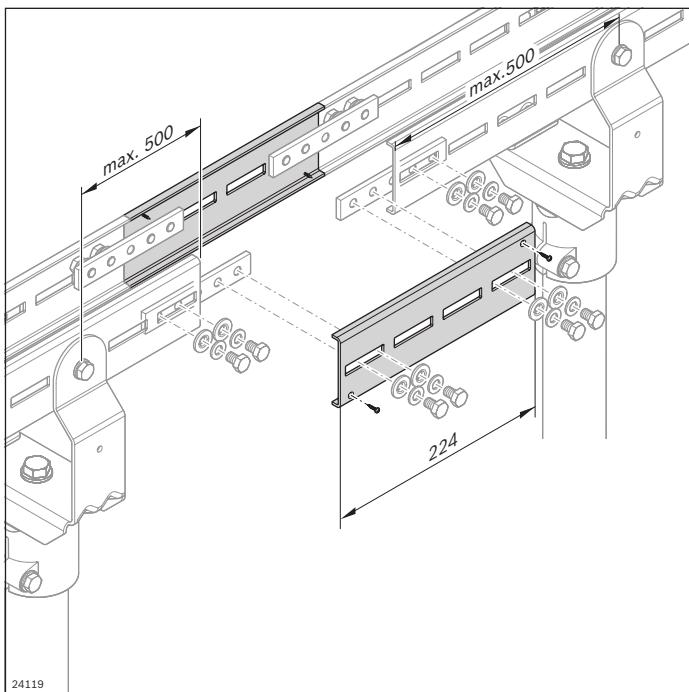
Material:

- Non-rusting steel 1.4301

Scope of delivery:

- Assembly required

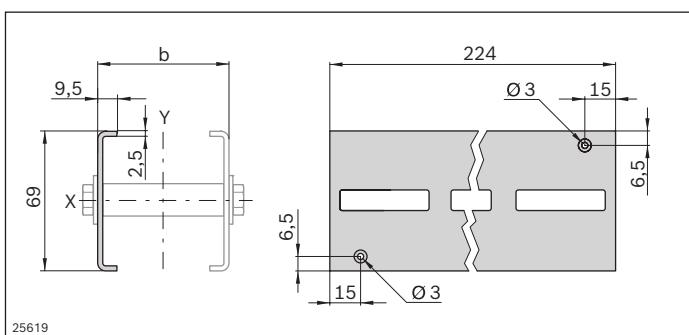
Assembly module STS



The assembly module is used for inserting and closing or opening the chain. It can be installed at any point on the conveyor section that is easy to access in operation.

The assembly module is intended for sections with drives without a chain bag (e.g. wedge conveyor).

- Max. distance from the nearest leg sets on both sides is 500 mm
- The support profile with sliding rail is not interrupted in the assembly module to increase the smooth running
- Sliding rail interruption is only required on the side to be opened



	L (mm)		No.
Assembly module VFplus STS	1	3 842 547 900	
Sliding rail VFplus Premium	30000	1	3 842 546 116
Sliding rail VFplus Advanced	30000	1	3 842 549 727
Sliding rail VFplus Basic	30000	1	3 842 549 730
Sliding rail VFplus Steel	3000	1	3 842 552 970
Sliding rail VFplus ESD	30000	1	3 842 557 000

Required accessories:

- Sliding rail, see p. 138, 140, 200

Scope of delivery:

- Incl. 4 profile connectors and sheet-metal screws for fastening the sliding rail

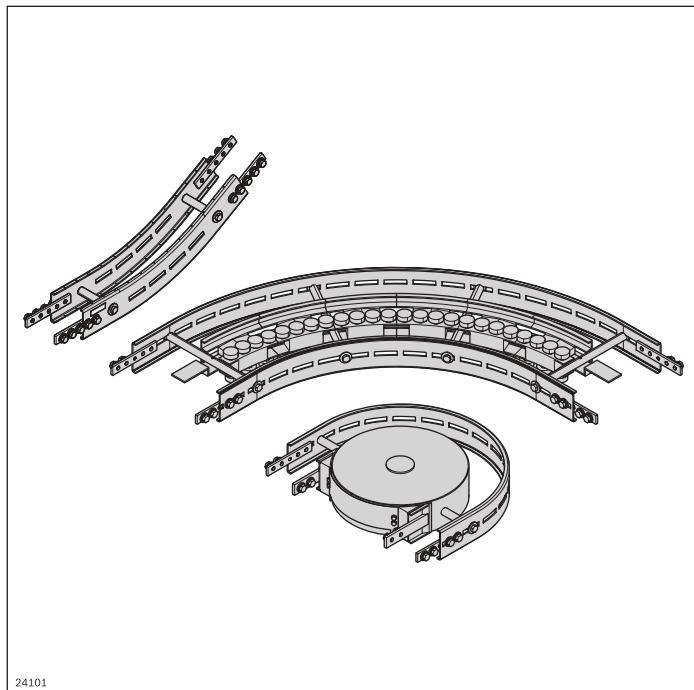
Material:

- Non-rusting steel 1.4301

Condition on delivery:

- In single parts

Curves STS

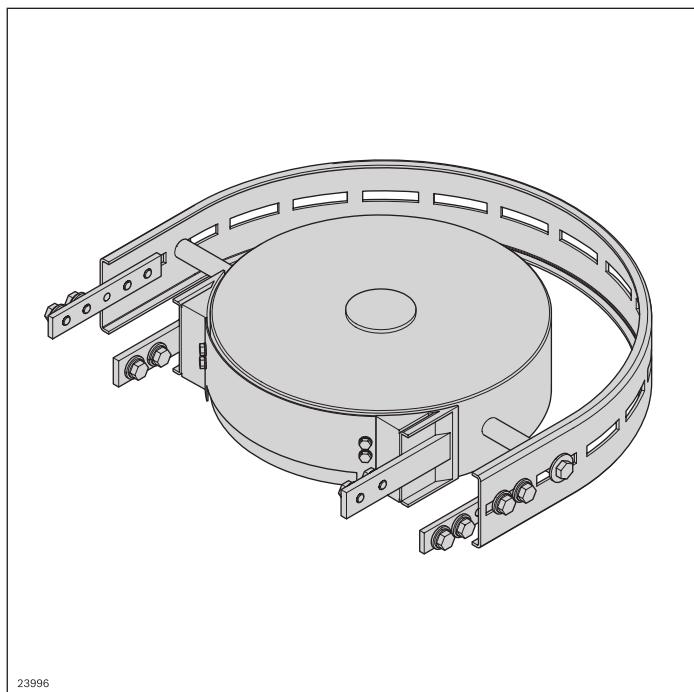


24101

- ▶ Longer service life and reduced downtimes thanks to low-friction curve technology
- ▶ Components subject to constant friction feature FDA-compliant materials
- ▶ Easy to clean thanks to ample draining surfaces
- ▶ Capable of accumulation
- ▶ Reduced friction on curve wheels and patented roller curves to minimize wear to thereby realize longer sections
- ▶ Ball bearings sealed on both sides of non-rusting steel (1.4301) with FDA-compliant special grease in curve wheels and patented roller curves

	Curve wheel STS	146
	Sliding curve horizontal STS	148
	Roller curve horizontal STS	150
	Vertical curve STS	152

Curve wheel STS



- ▶ Easy-to-clean design
- ▶ Ball bearing made of non-rusting steel (1.4301), with seal on both sides and FDA-compliant grease filling
- ▶ Surfaces in contact with chain made of FDA-compliant materials

Scope of delivery:

- Incl. fastening material for mounting to STS section profiles

Material:

- Housing: Non-rusting steel 1.4301
- Chain wheel: PA; white
- Ball bearing: Non-rusting steel 1.4301/FDA

The curve wheel provides a horizontal direction change for the chain. It enables low-friction direction changes with very small radii.

For attachment options, see the matrix on page 329

- Size: 65, 90, 120
- For deflection angles, see table
- Other deflection angles on request
- Suitable chain types: all

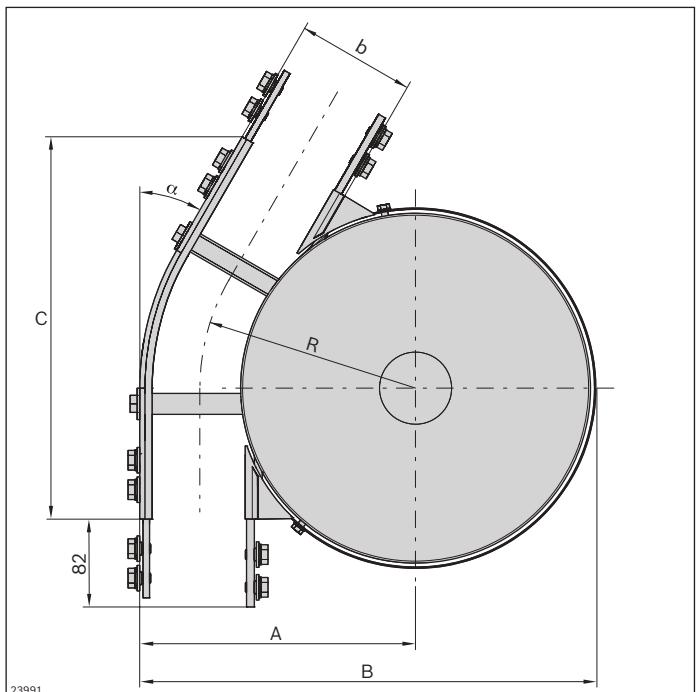
Notes:

- High-pressure cleaning of the ball bearing areas is not permitted
- In combination with the connection drive STS, the lower branch must be covered by the customer
- Centering aids for mounting holes (3x DIN 798-ST4.8) of customer-specific interior lateral guides are available. The superstructures rotate with the curve wheel

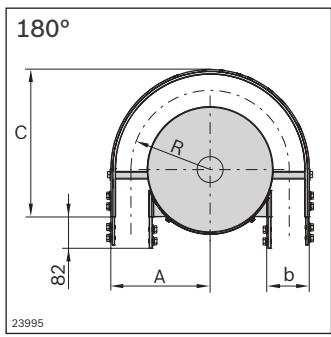
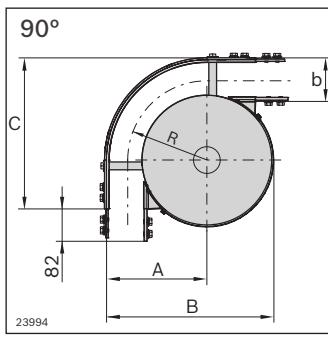
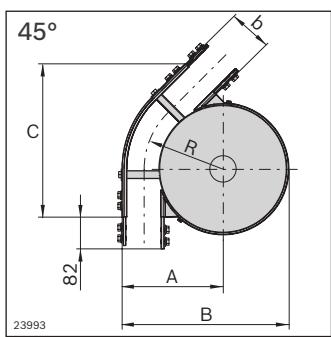
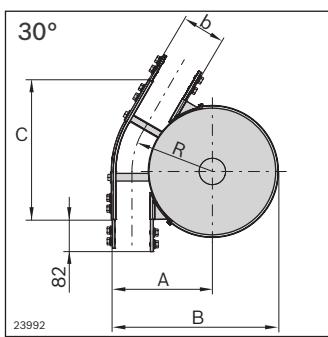
- ▶ No interfering contours above chain plate height
- ▶ Can be used horizontally and vertically (for wedge conveyors)

Condition on delivery:

- Assembled

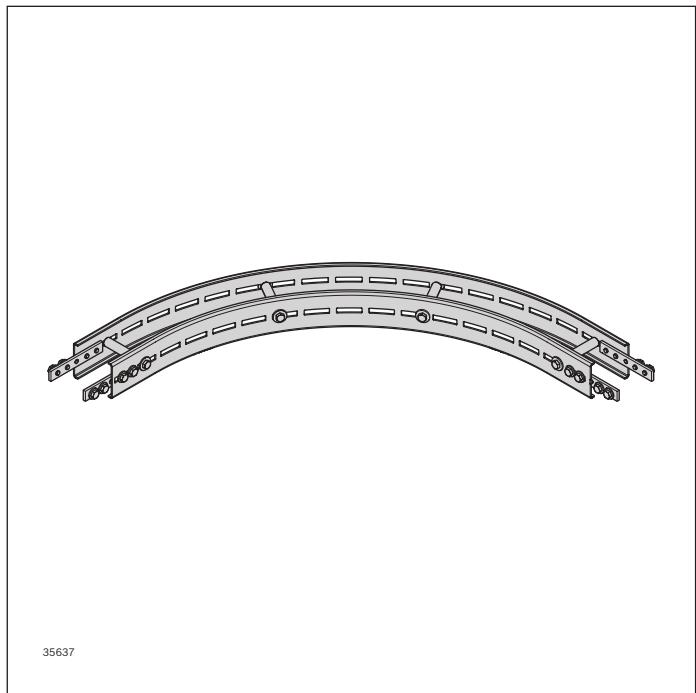


Curve wheel STS	α (°)	No.
VFplus 65	30	3 842 547 111
	45	3 842 547 112
	90	3 842 547 113
	180	3 842 547 114
VFplus 90	30	3 842 547 115
	45	3 842 547 116
	90	3 842 547 117
	180	3 842 547 118
VFplus 120	30	3 842 547 119
	45	3 842 547 120
	90	3 842 547 121
	180	3 842 547 122



b (mm)	α (°)	R (mm)	A (mm)	B (mm)	C (mm)
65	30	153.0	185.5	322.5	279.4
	45	153.0	185.5	322.5	301.9
	90	153.0	185.5	322.5	285.5
	180	153.0	185.5	–	287.5
90	30	165.5	210.5	347.5	291.9
	45	165.5	210.5	347.5	319.6
	90	165.5	210.5	347.5	310.5
	180	165.5	210.5	–	312.5
120	30	180.5	240.5	377.5	306.9
	45	180.5	240.5	377.5	340.8
	90	180.5	240.5	377.5	340.5
	180	180.5	240.5	–	342.5

Sliding curve horizontal STS



The sliding curve provides a horizontal change in direction for the chain, for when there is not enough space for a curve wheel or the speeds or product dimensions do not permit conveying over a curve wheel. The sliding curve is used to reduce noise at high speeds or when transporting long products in wedge conveyors. The chain tensile force is increased through the ensuing friction.

For attachment options, see the matrix on page 329

- Size: 65, 90, 120
- Deflection angles and radii up to size 120 see table on p. 149, other deflection angles and radii on request
- Suitable chain types: all
- Version with open section profiles
- Requires the use of the "Advanced" or "Premium" sliding rails
- Use in abrasive environments is not permissible

Required accessories:

- Sliding rail: Length calculation, see p. 314

Scope of delivery:

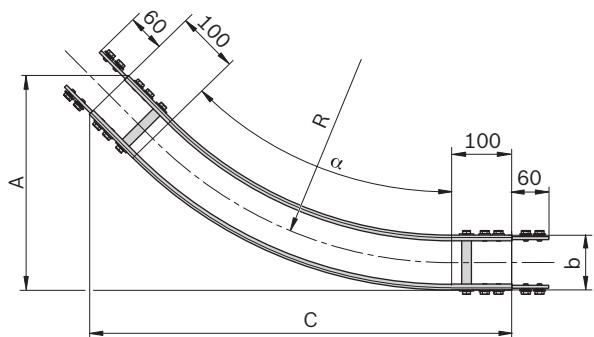
- Incl. fastening material for mounting to STS section profiles

Material:

- Non-rusting steel 1.4301

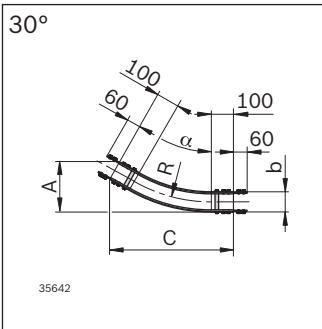
Condition on delivery:

- Assembled

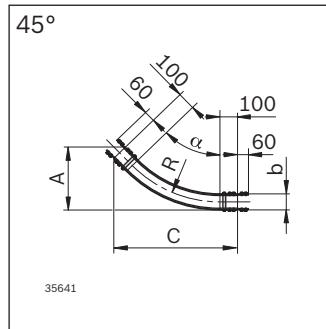


35639

Sliding curve horizontal STS	α (°)	R (mm)	No.
VFplus 65	30	700	3 842 557 051
	45	700	3 842 557 052
	90	700	3 842 557 053
VFplus 90	45	500	3 842 557 054
	90	500	3 842 557 055
	30	700	3 842 557 056
VFplus 120	45	700	3 842 557 057
	90	700	3 842 557 058
	30	700	3 842 557 059
VFplus 120	45	700	3 842 557 060
	90	700	3 842 557 061

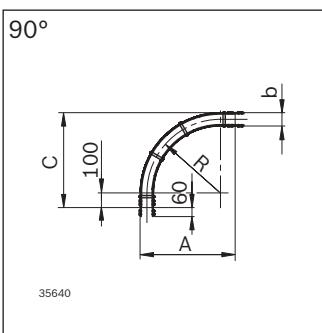


35642



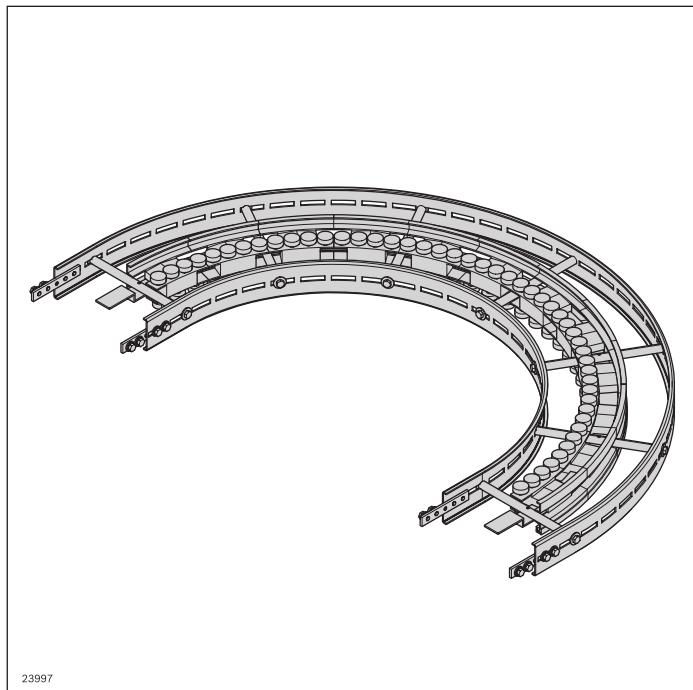
35641

b (mm)	α (°)	R (mm)	A (mm)	C (mm)
65	30	700	204.4	552.9
	45	700	331.2	688.7
	90	700	832.5	832.5
90	45	500	294.0	556.1
	90	500	645.0	645.0
	30	700	227.8	559.1
	45	700	352.6	697.5
	90	700	845.0	845.0
120	30	700	255.7	566.6
	45	700	378.2	708.1
	90	700	860.0	860.0



35640

Roller curve horizontal STS



23997

- ▶ Patented roller elements for low-friction, quieter changes in chain direction
- ▶ Easy-to-clean design
- ▶ Ball bearing made of non-rusting steel (1.4301), with seal on both sides and FDA-compliant grease filling

Required accessories:

- Sliding rail: Length calculation, see p. 314

Scope of delivery:

- Incl. fastening material for mounting to STS section profiles

Material:

- Profile: Non-rusting steel 1.4301
- Roller carrier: PA66
- Ball bearing: Non-rusting steel 1.4301/FDA
- Connector: Non-rusting steel 1.4301
- Rollers: PA

The low-friction roller curve provides a horizontal change in direction for the chain. Plastic-coated roller elements with ball bearings enable longer conveyor sections. The service life of the chain is increased and system costs are reduced.

For attachment options and length determination of the support profile, see matrix on page 329

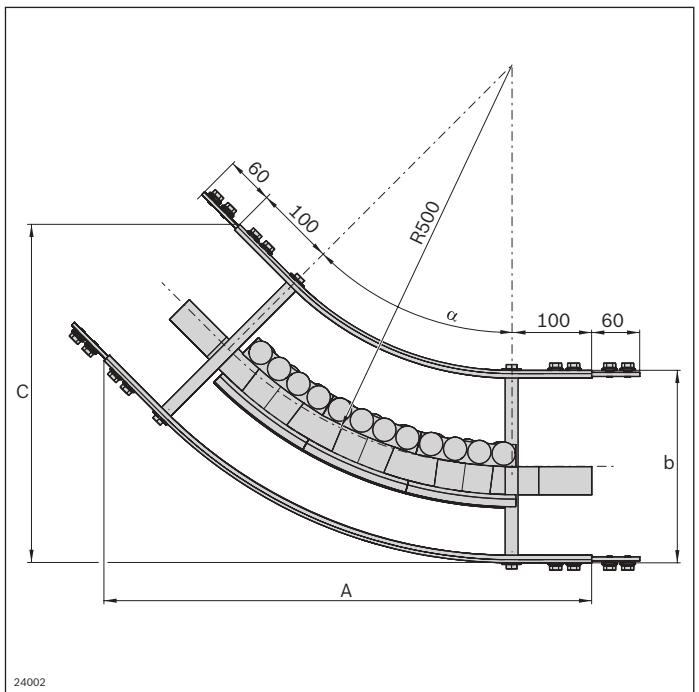
- Size: 160, 240, 320
- See table for the deflection angles, more deflection angles available on request
- Deflection radius: R500
- Suitable chain types: all
- Version with open section profiles

Notice: High-pressure cleaning of the ball bearing areas is not permitted.

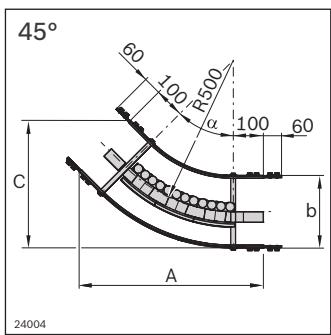
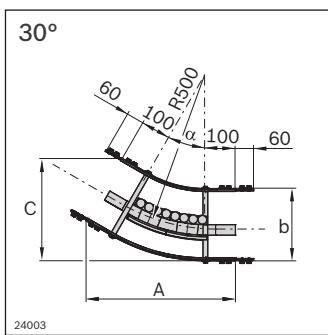
- ▶ Surfaces in contact with chain made of FDA-compliant materials

Condition on delivery:

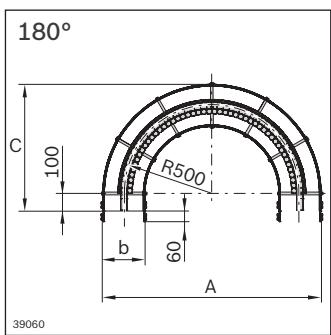
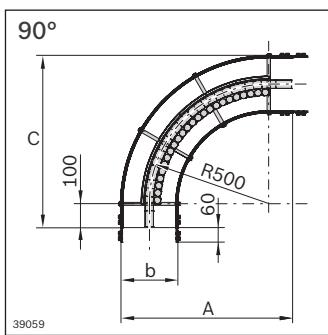
- Assembled



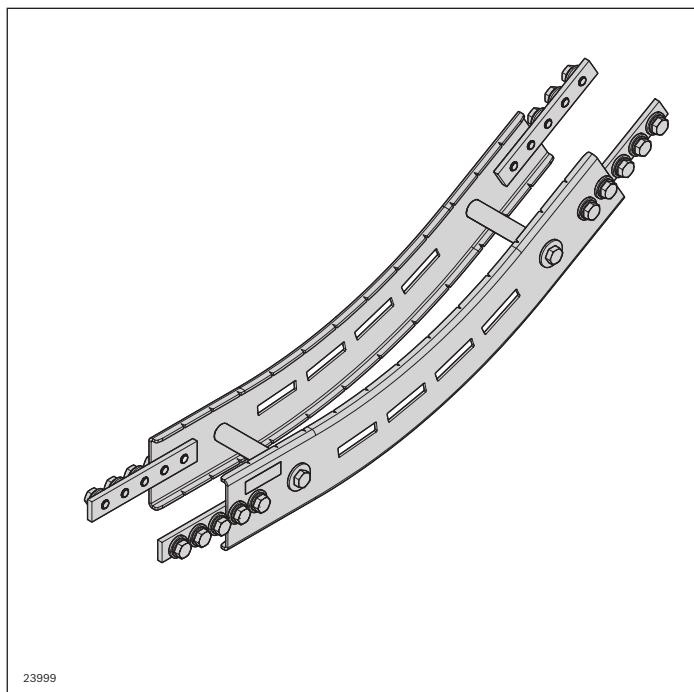
Roller curve STS	α (°)	No.
VFplus 160	30	3 842 547 123
	45	3 842 547 124
	90	3 842 547 125
	180	3 842 547 126
VFplus 240	30	3 842 547 127
	45	3 842 547 128
	90	3 842 547 129
	180	3 842 547 130
VFplus 320	30	3 842 547 131
	45	3 842 547 132
	90	3 842 547 133
	180	3 842 547 134



b (mm)	α (°)	A (mm)	C (mm)
160	30	476.6	266.3
	45	580.8	353.7
	90	680.0	680.0
	180	1160.0	680.0
240	30	496.6	340.9
	45	609.1	422.0
	90	720.0	720.0
	180	1240.0	720.0
320	30	516.6	415.6
	45	637.4	490.3
	90	760.0	760.0
	180	1320.0	760.0



Vertical curve STS



The vertical curve is used for the transition from a horizontal conveyor section to an ascending section and vice versa. The chain tensile force is increased through the ensuing friction.

A vertical curve of 5° is recommended for the infeed and outfeed on the wedge conveyor, especially with small products.

For attachment options, see the matrix on page 329

- Size: all
- See table for the deflection angles and radii, more deflection angles available on request
- Suitable chain types: all
- Version with open section profiles
- Requires the use of the "Advanced" or "Premium" sliding rails

Required accessories:

- Sliding rail: Length calculation, see p. 314

Scope of delivery:

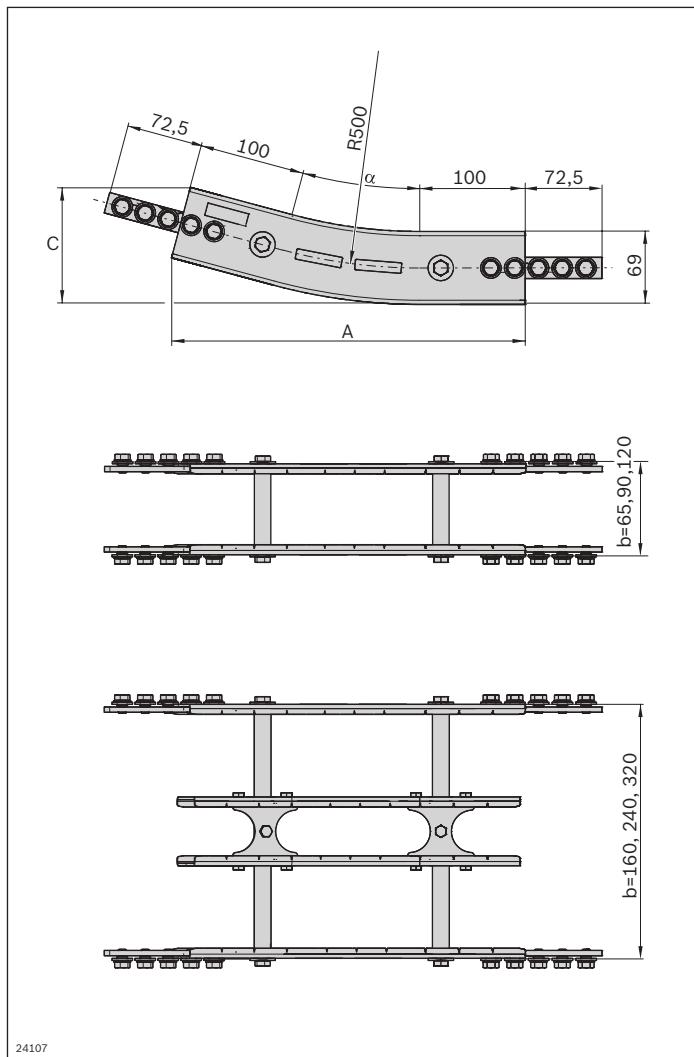
- Incl. fastening material for mounting to STS section profiles

Material:

- Profile: Non-rusting steel 1.4301
- Connector: Non-rusting steel 1.4301
- Support profile from size 160: Non-rusting steel 1.4301

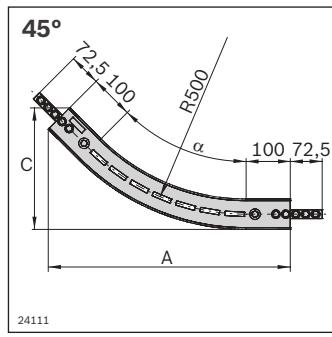
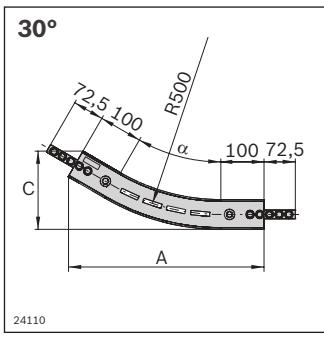
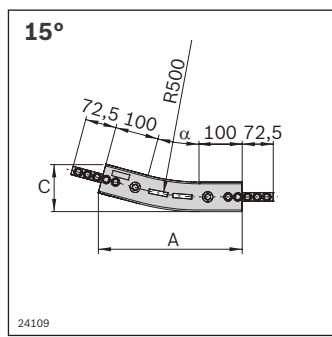
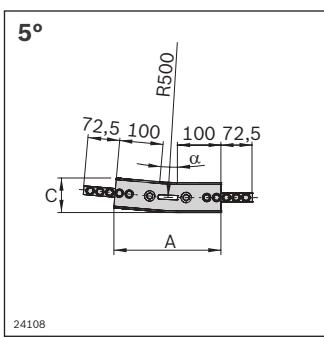
Condition on delivery:

- Assembled

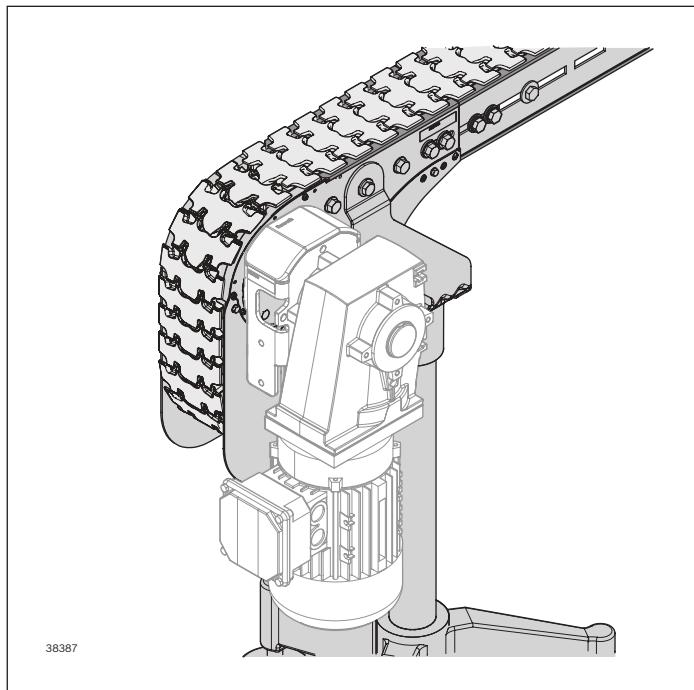
**Vertical curve STS**

	α (°)	No.
VFplus 65	5	3 842 547 135
	15	3 842 547 136
	30	3 842 547 137
	45	3 842 547 138
VFplus 90	5	3 842 547 139
	15	3 842 547 140
	30	3 842 547 141
	45	3 842 547 142
VFplus 120	5	3 842 547 143
	15	3 842 547 144
	30	3 842 547 145
	45	3 842 547 146
VFplus 160	5	3 842 547 147
	15	3 842 547 148
	30	3 842 547 149
	45	3 842 547 150
VFplus 240	5	3 842 547 151
	15	3 842 547 152
	30	3 842 547 153
VFplus 320	5	3 842 547 154
	15	3 842 547 155
	30	3 842 547 156

b (mm)	α (°)	R (mm)	A (mm)	C (mm)
65-320	5	500	246.2	79.5
	15	500	334.9	110.7
	30	500	453.9	181.4
65-160	45	500	548.7	276.1



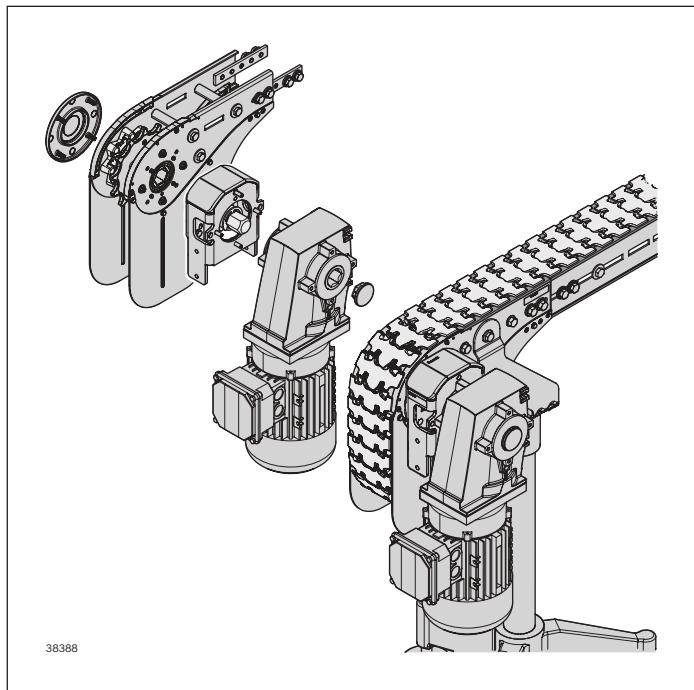
Drive and return unit STS



- ▶ High flexibility and short delivery times thanks to a novel drive concept
- ▶ Basic units with interfaces on both sides for drive kit and transmission (active bridges)
- ▶ Free choice of the motor mounting position on site
- ▶ Configurable drive kit (standard gear motor or round shaft)
- ▶ Multi-track systems with standard components possible
- ▶ Integrated sliding rail for reducing noise and wear
- ▶ In-stock, standardized components
- ▶ Side elements with slots for accommodating holders

	Basic unit STS Head drive direct	158
	Basic unit STS Connection drive	160
	Basic unit Center drive	162
	Return unit STS Closed head drive STS	164
	90° return unit	166
	Drive kit	168
	Frequency converter motec 8400	171
	Manual control unit	174
	Passive/active bridge connection kit	176
	Connection kit Synchronous drive, external motor/internal motor	186

Innovative drive concept



Basic unit STS
(head drive direct, center or
connection drive)

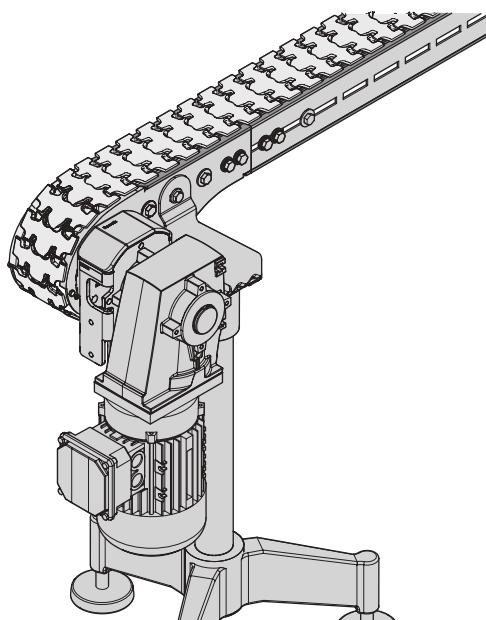
or return unit

+

Configurable drive kit
(standard gear motor or round shaft)

=

Complete drive



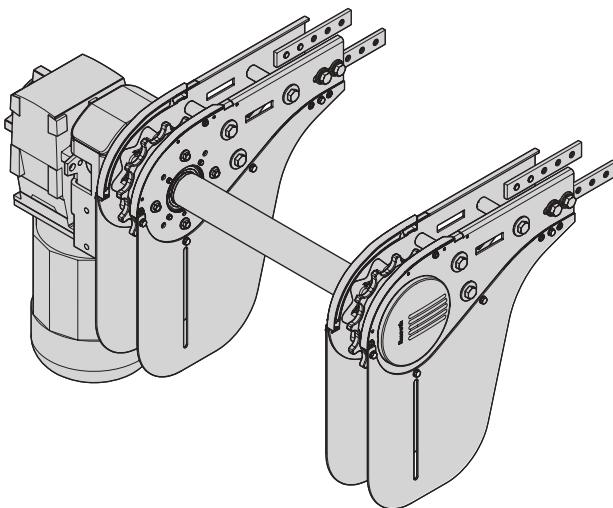
The well thought-out drive solution enables high flexibility and planning freedom

The in-stock, standardized basic units

- Are quickly and easily combined with the configurable drive kit (standard gear motor or customer-specific interface) into a complete drive
- Guarantee fast availability of the few construction kit elements/spare parts

The hollow shaft on both sides in the basic unit and return unit

- Enables a free selection of the motor mounting position on-site
- offers other interfaces for transmissions (active bridges)



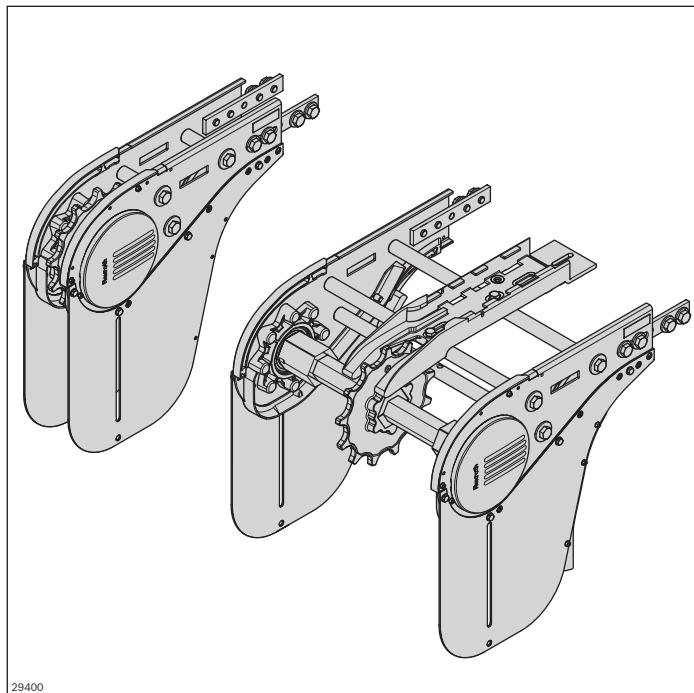
The standard drives are easy to couple and enable straightforward implementation of multi-track systems

For attachment options, see the matrix on page 329

Notice: High-pressure cleaning of the ball bearing areas is not permitted.

Basic unit STS

Head drive direct



The basic unit is quickly turned into a head drive with variable mounting position by adding a drive kit. With the double-sided hexagonal hollow shaft, other components can be easily driven using a transmission (active bridges).

- Size: all track widths
- Suitable chain types: all
- Permissible chain tensile force: $F_{\max} = 1250 \text{ N}$
- Section length: $L \leq 30 \text{ m}$
- Conveyor speed: $v_N = 2 \dots 60 \text{ m/min}$, $v_N = 60 \dots 120 \text{ m/min}$ (see chapter "Technical data" on page 304)
- Chain bag to compensate for chain elongation during service life
- Not suitable for reversible operation

Notes:

- A chain sprocket must be used to limit the chain slipping back ascending or descending sections.
- Chain sprocket prevents the chain bag from swiveling out
- Ball bearing made of non-rusting steel (1.4301), with seal on both sides and FDA-compliant grease filling
- Side elements with mounting option to attach holders for lateral guides, or similar

- ▶ Reduced noise emission due to sliding rails guided in the head drive
- ▶ Installation of the drive kit possible on the right/left (motor, coupling, flange)
- ▶ Drive of a parallel conveyor section or bridge using a hexagonal hollow shaft integrated as standard

Required accessories:

- Drive kit, see p. 168
- Sliding rail: Length calculation, see p. 314
- Motor leg sets, see p. 191

Optional accessories:

- Passive bridge connection kit, see p. 176ff.
- Active bridge connection kit, see p. 182ff.
- Synchronous drive connection kit, see p. 186
- Chain sprocket for inclined sections, see p. 159

Scope of delivery:

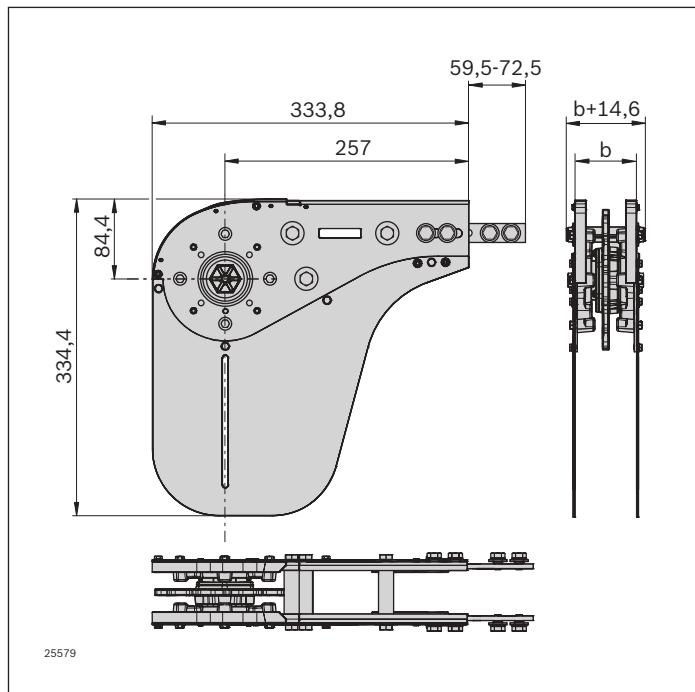
- Incl. fastening material

Condition on delivery:

- Assembled
- Connector, chain guard enclosed

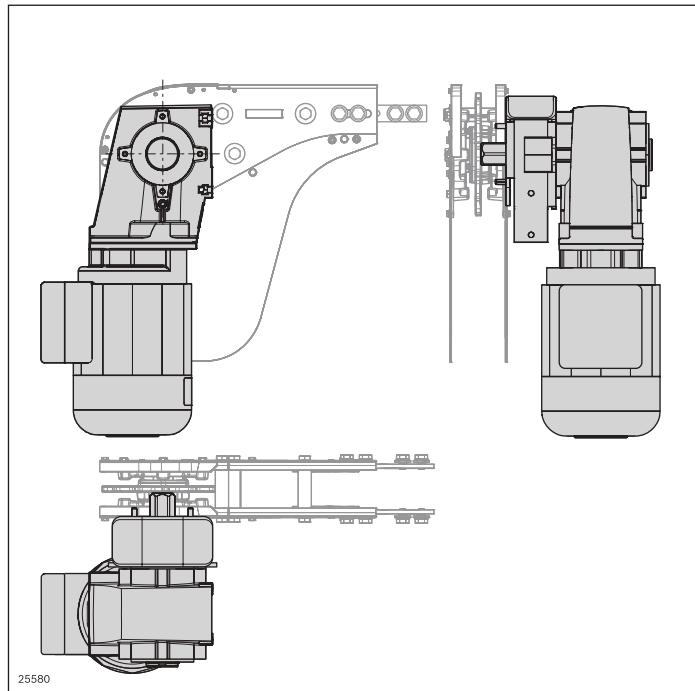
Material:

- Housing: Non-rusting steel 1.4301
- Chain wheel: PA
- Chain guide: PA
- Connector: Non-rusting steel 1.4301
- Hexagonal shaft up to size 160: PA
From size 160: Non-rusting steel 1.4301, PA
- Ball bearing: Non-rusting steel 1.4301/FDA

**Basic unit STS****No.**

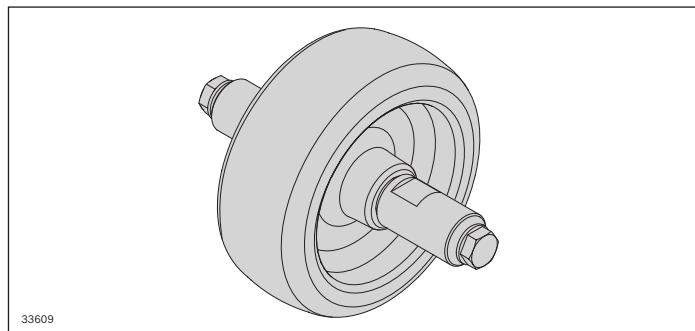
VFplus 65 direct	3 842 547 522
VFplus 90 direct	3 842 547 523
VFplus 120 direct	3 842 547 524
VFplus 160 direct	3 842 547 525
VFplus 240 direct	3 842 547 526
VFplus 320 direct	3 842 547 527

Order the drive kit in addition to the STS basic direct unit (see p. 168) to complete your drive.

**Drive kit VFplus****No.**

3 842 998 291

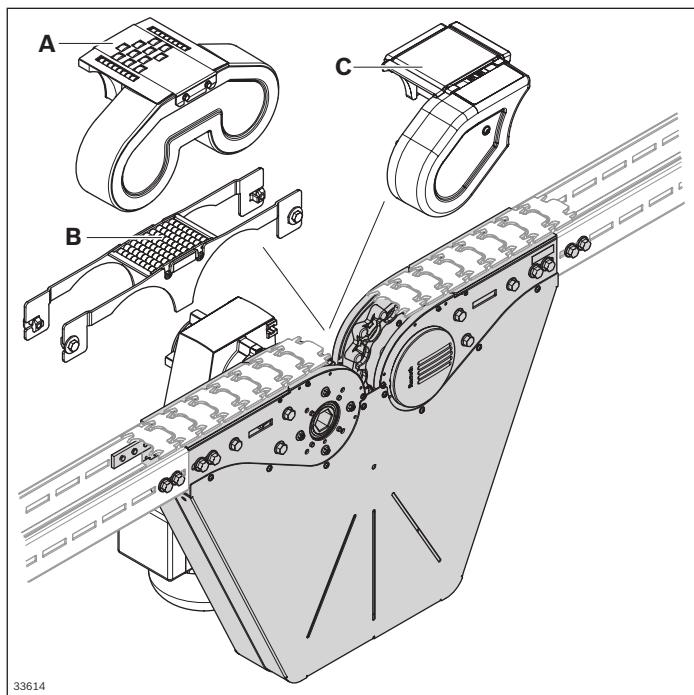
See p. 168

**Chain sprocket****No.**

VFplus 65	3 842 553 047
VFplus 90	3 842 553 048
VFplus 120	3 842 553 049
VFplus 160	3 842 553 057
VFplus 240	3 842 553 058
VFplus 320	3 842 553 059

Basic unit STS

Connection drive



Notice: The selection of the parameter SP = STS for the drive kit 3 842 998 291 is imperative.

- ▶ Reduced noise emission due to sliding rails guided in the connection drive
- ▶ Drive kit (motor, coupling, flange) can be mounted right / left
- ▶ Drive of a parallel conveyor section or bridge using a hexagonal hollow shaft integrated as standard
- ▶ Ball bearing made of non-rusting steel (1.4301), with seal on both sides and FDA-compliant grease filling
- ▶ Side elements with slot for attaching holders for lateral guides, or similar

Required accessories:

- Drive kit, see p. 168
- Passive bridge connection kit, see p. 176ff.
- Active bridge connection kit, see p. 182ff.
- Sliding rail: Length calculation, see p. 314

The connection drive is used for driving the conveyor chain in circuit systems with a top-running chain. The basic unit is quickly turned into a connection drive with variable mounting position by adding a drive kit.

An active (**A, C**) or passive bridge (**B**) must be added for transferring the material being transported. The active bridge (**A, C**) is driven by a transmission from the connection drive

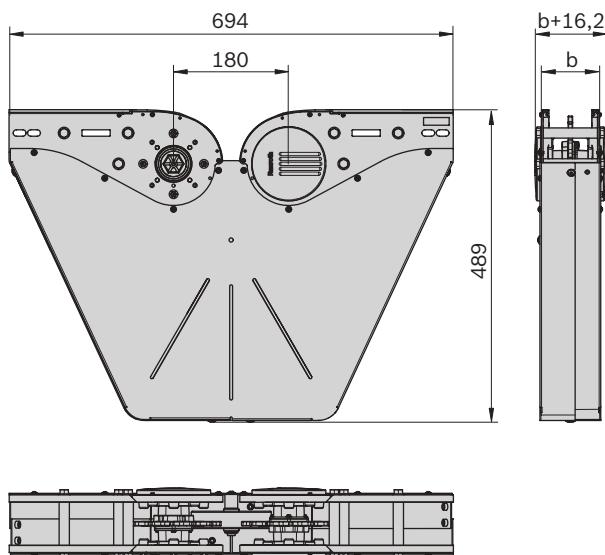
- Size: 65, 90
- Suitable chain types: Flat conveyor chain, static friction chain
- Permissible chain tensile force: $F_{\max} = 1250 \text{ N}$
- Section length: $L \leq 30 \text{ m}$
- Conveying speed: $v_N = 2 \dots 25 \text{ m/min}$, other speeds available on request
- Chain bag to compensate for chain elongation during service life
- Recommendation: No accumulation operation up to 1500 mm after the connection drive
- When using the STS section profile (open) in conveyor systems without a returning chain, a cover must be placed over the lower run by the customer to ensure personal safety.
- Not suitable for reversible operation
- Use in ESD applications with accompanying adapter kit and closed AL section profiles (bridges not conductive!)

Scope of delivery: Incl. fastening material

Condition on delivery: Assembled

Material:

- Housing: Non-rusting steel 1.4301
- Sprocket, chain guide, hexagonal shaft: PA
- Connector + chain fender: Non-rusting steel 1.4301
- Ball bearing: Non-rusting steel 1.4301/FDA



33615

Basic unit connection drive STS**No.**

VFplus 65 direct	3 842 553 914
VFplus 90 direct	3 842 553 915

Notice: When using the section profile STS Clean with the basic units (head drive, return unit, connection drive) the enclosed profile connector ($H = 20 \text{ mm}$) must be replaced with the profile connector STS Clean Section ($H = 17 \text{ mm}$) 3 842 552 927.

Drive kit VFplus**No.**

3 842 998 291

SP = STS; see p. 168

Active roller bridge connection kit (A)**No.**

VFplus 65	3 842 555 820
VFplus 90	3 842 555 821

See p. 184

Active belt bridge connection kit (C)**No.**

VFplus 65	L	3 842 558 000
VFplus 65	R	3 842 558 001
VFplus 90	L	3 842 558 002
VFplus 90	R	3 842 558 003

See p. 182

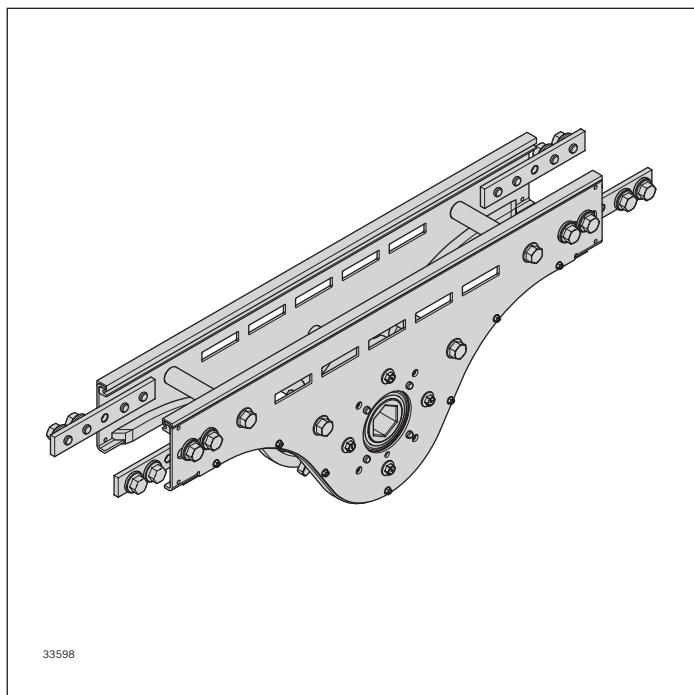
Passive bridge connection kit (B)**No.**

VFplus 65	3 842 549 015
VFplus 90	3 842 549 016

See p. 176

Basic unit

Center drive



The center drive basic unit is used if the available space is limited at the ends of the sections.

It is quickly turned into a center drive with variable motor mounting position by adding the drive kit

- Size: 65-120
- Chain return on the underside of the profile
- Conveying speed: $v_N = 2 \dots 60 \text{ m/min}$, other speeds available on request
- Permissible chain tensile force: $F_{\max} = 600 \text{ N}$
- Max. conveying length: 7 m
- Because no length compensation (chain bag) is present, the chain length must be checked regularly and shortened if necessary
- Recommendation: No accumulation up to 1000 mm after the return unit
- An assembly module is required for assembling the chain

- ▶ Reduced noise emission due to sliding rails guided in the center drive
- ▶ Installation of the drive kit possible on the right/left (motor, coupling, flange)
- ▶ Drive of a parallel conveyor section using a hexagonal hollow shaft integrated as standard

Required accessories:

- Drive kit, see p. 163
- Sliding rail, see p. 138
- Motor leg sets, see p. 191
- Assembly module, see p. 143

Scope of delivery:

- Incl. fastening material

Condition on delivery:

- Assembled (profile connector enclosed)

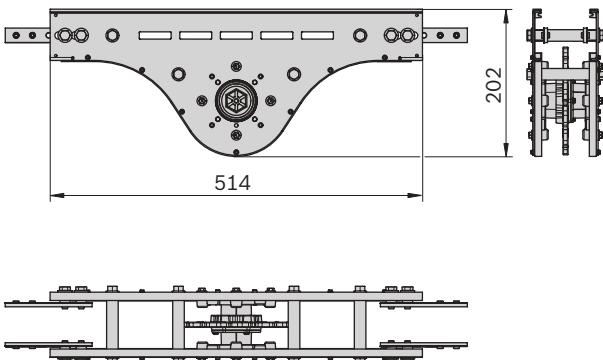
- ▶ Ball bearing made of non-rusting steel (1.4301), with seal on both sides and FDA-compliant grease filling
- ▶ Side elements with slot for attaching holders for lateral guides, or similar

Optional accessories:

- Synchronous drive connection kit, see p. 186
- Frequency converter, see p. 171

Material:

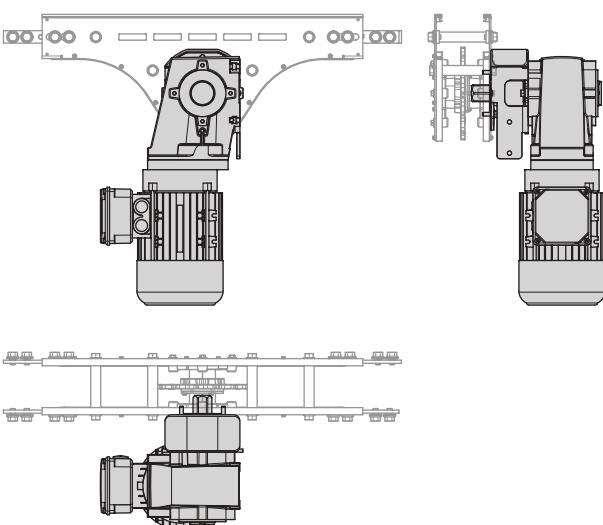
- Housing: Non-rusting steel 1.4301
- Chain wheel: PA
- Chain guide: PA
- Connector: Non-rusting steel 1.4301
- Hexagonal shaft: PA
- Ball bearing: Non-rusting steel 1.4301/FDA



33610

Basic unit center drive**No.**

VFplus 65	3 842 552 940
VFplus 90	3 842 552 941
VFplus 120	3 842 552 942



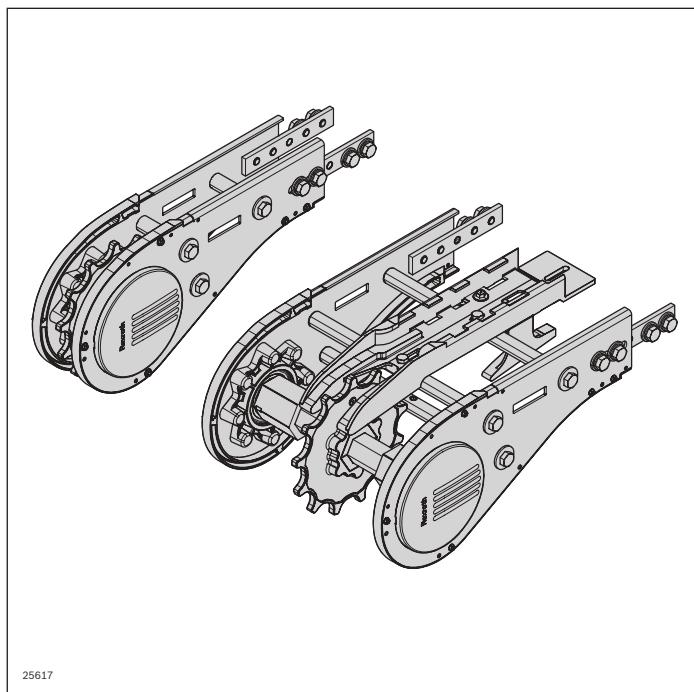
33600

Drive kit VFplus**No.**

VFplus 65	3 842 998 291
See p. 168	

Return unit STS

Closed head drive STS



- ▶ Reduced noise emission due to sliding rails guided in the return unit
- ▶ Installation of the drive kit possible on the right/left (motor, coupling, flange)
- ▶ Drive of a parallel conveyor section or bridge using a hexagonal hollow shaft integrated as standard

Required accessories:

- Sliding rail: Length calculation, see p. 314

For use as a drive:

- Assembly module, see p. 143
- Drive kit, see p. 168
- Motor leg sets, see p. 191

Scope of delivery:

- Incl. fastening material

Condition on delivery:

- Assembled, connector enclosed

Thanks to the innovative drive concept, the return unit can be operated simply by itself or supplemented with a drive kit to be operated as a head drive without chain bag.

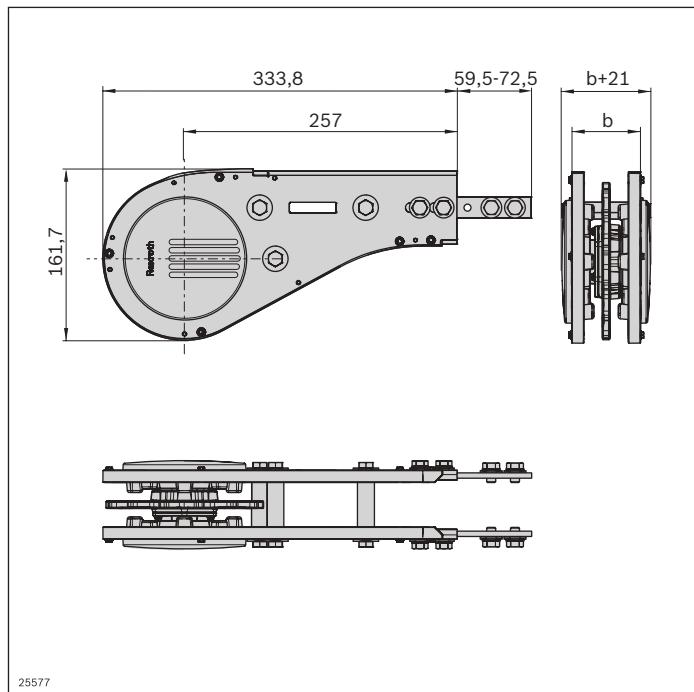
The section length is limited to a maximum of 7 m.

- Size: all track widths
- Suitable chain types: all
- Permissible chain tensile force
 - For return unit function: $F_{max} = 1250$ N
 - Head drive function without chain bag: $F_{max} = 600$ N
 - With shortened maintenance interval, due to chain elongation
- Section length for return unit function: $L \leq 30$ m
 - Section length for drive function: $L \leq 7$ m
- Conveying speed: $v_N = 2 \dots 60$ m/min, other speeds available on request
- Use as a drive for wedge conveyors, when combined with a drive kit
- Not suitable for reversible operation

- ▶ Ball bearing made of non-rusting steel (1.4301), with seal on both sides and FDA-compliant grease filling
- ▶ Implementation of parallel sections possible through a pluggable shaft
- ▶ Side elements with mounting option to attach holders for lateral guides, or similar

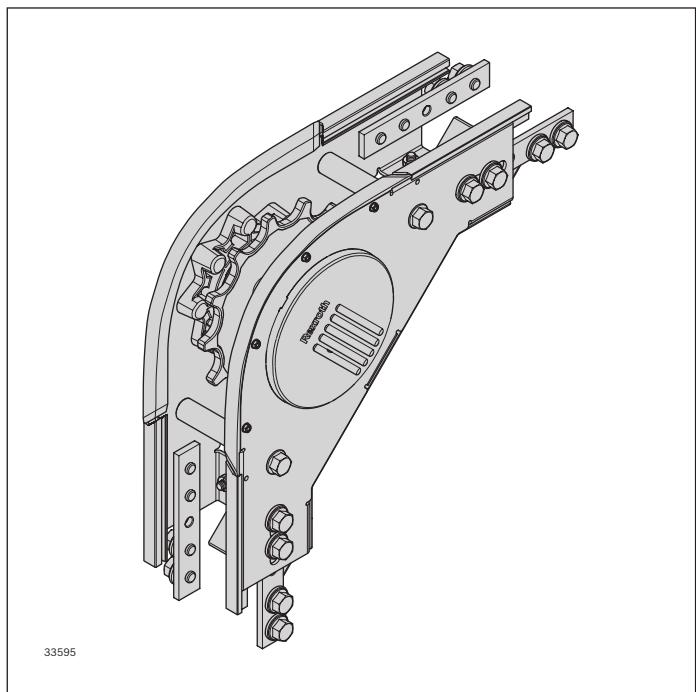
Material:

- Housing: Non-rusting steel 1.4301
- Chain wheel: PA
- Chain guide: PA
- Connector: Non-rusting steel 1.4301
- Hexagonal shaft
 - Up to size 160: PA
 - From size 160: Non-rusting steel 1.4301, PA
- Ball bearing: Non-rusting steel 1.4301/FDA



Return unit STS	No.
VFplus 65	3 842 547 528
VFplus 90	3 842 547 529
VFplus 120	3 842 547 530
VFplus 160	3 842 547 531
VFplus 240	3 842 547 532
VFplus 320	3 842 547 533

90° return unit



Advantage over alpine conveyor with head drive:

- ▶ Shorter chain return, so the required tensile force of the conveyor chain is lower and therefore the possible volume of the alpine conveyor is larger.

Scope of delivery:

- Incl. fastening material

Condition on delivery:

- Assembled

For building alpine conveyors with chain running only on the upper side.

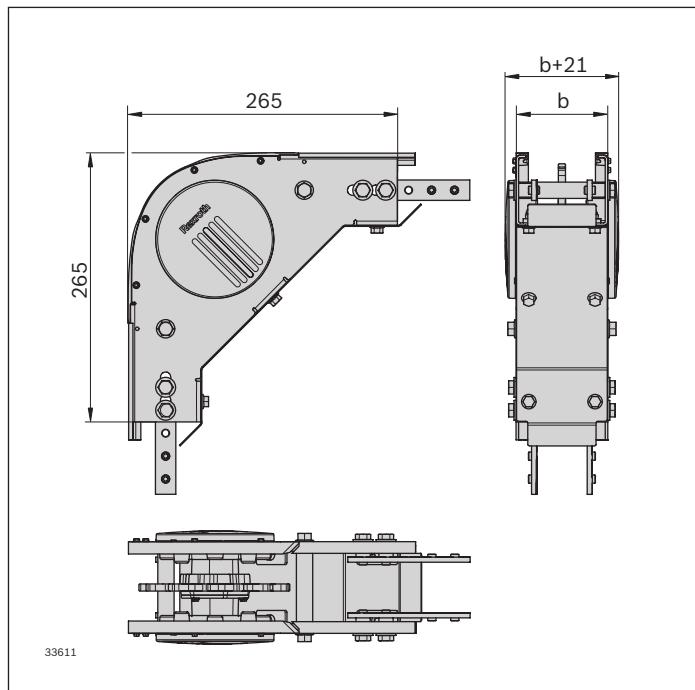
- Only for use with connection drive (AL and STS)
- Size: 65, 90
- Section length: $L_{\max} = 30 \text{ m}$

Notice: When using conveyor systems without a returning chain, a cover must be mounted by the customer to ensure personal safety.

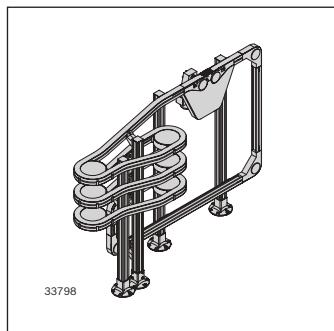
- ▶ No longer necessary to mount the sliding rails required for the chain return on the bottom side of the profile
- ▶ The required conveyor chain is shorter

Material:

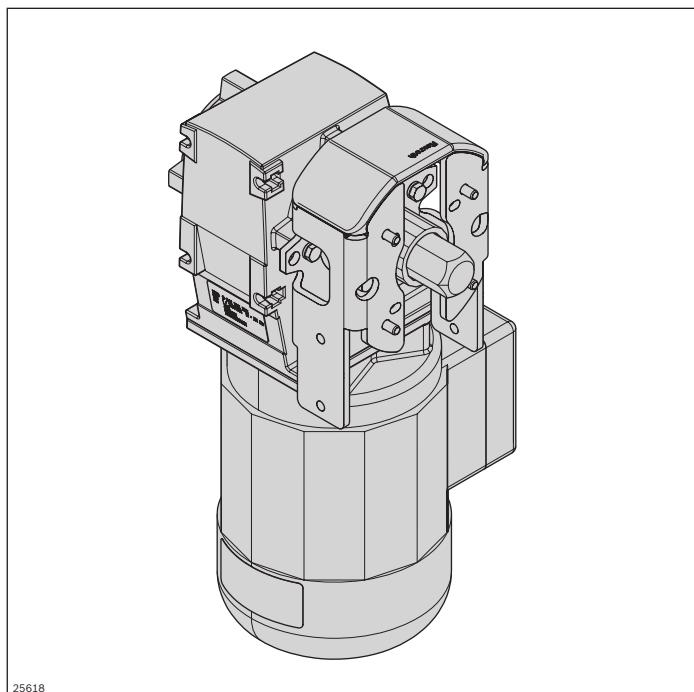
- Housing: Non-rusting steel 1.4301
- Chain wheel: PA
- Chain guide: PA
- Connector: Non-rusting steel 1.4301
- Hexagonal shaft, PA
- Ball bearing: Non-rusting steel 1.4301/FDA

**90° return unit**

	No.
VFplus 65	1 3 842 552 984
VFplus 90	1 3 842 552 985



Drive kit



Required accessories:

- Motor leg sets, see p. 191

Optional accessories:

- Frequency converter, see p. 171

Scope of delivery:

- Incl. fastening material
- Incl. flange, shaft and gear motor (GM = 1)

Condition on delivery:

- Kit

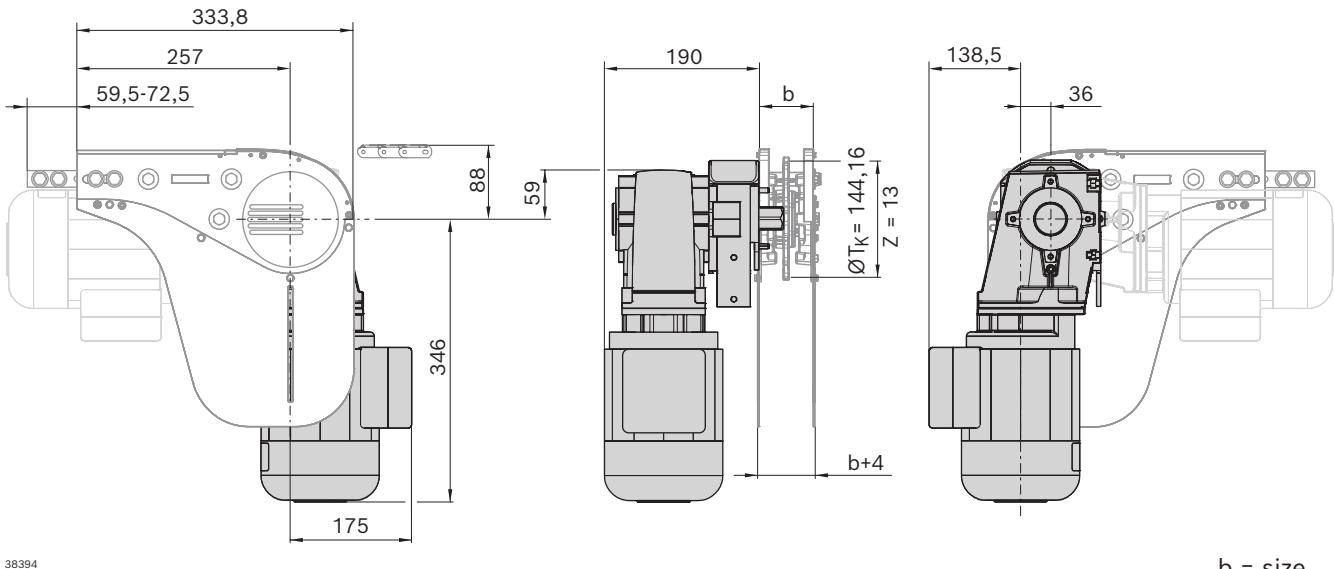
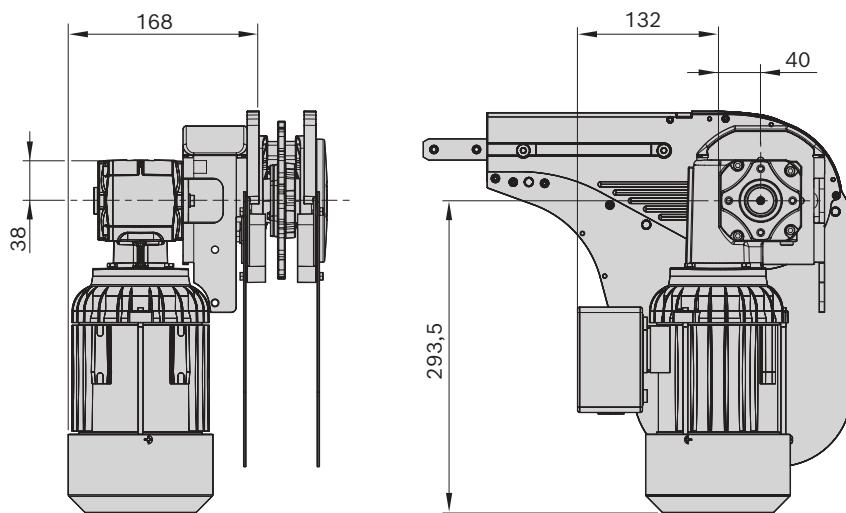
Material:

- Flange, shaft: Non-rusting steel 1.4301
- Motor: Diecast aluminum
- Cover tube: PE

The drive kit is designed to operate the basic head drive unit. It contains a flange for attaching the motor to the basic unit, a hexagonal shaft for transmission of force, as well as other optional equipment features.

- Versions in aluminum (SP = AL) or stainless steel (SP = STS)
- With Lenze gear motor (GM = 1) or with an interface for attaching an SEW SA47 gear motor (GM = 2). An adaptation by the customer is required for attaching other gear motors (GM = 0)
- In order to ensure a compact installation situation, smaller and lighter gear motors (GM = 3) or an interface for the installation of an SEW SA37 gear motor (GM = 4) are available for applications with low load
- Fixed or adjustable speed (v_N). For an adjustable speed, gear motors must be retrofitted with an FU (frequency converter), see p. 171
- Different voltages and line frequencies (U/f)
- Connections are made using terminal boxes (AT = K) or plugs (AT = S)
- GM = 1 without surface and corrosion protection

Notice: If third-party motors (GM = 0, GM = 2) are used, support directly on the motor may be required (to avoid twisting).

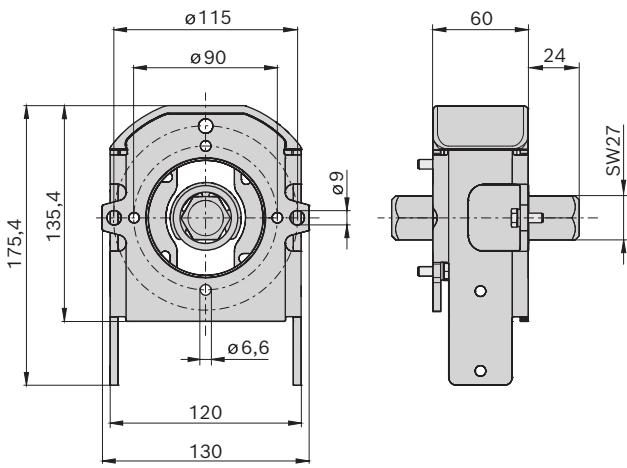
SP = STS, GM = 1**STS GM = 3**

Drive kit VFplus	SP	GM	v_N (m/min)** See p. 317	U/f (V/Hz)	AT	No.
STS; AL* 0: 1; 2; 3; 4			5, 10, 13, 16, 21, 27, 33, 40, 50		K; S	3 842 998 291 SP = ... GM = ... v_N = ... U/f = ... AT = ...

* AL version see p. 92

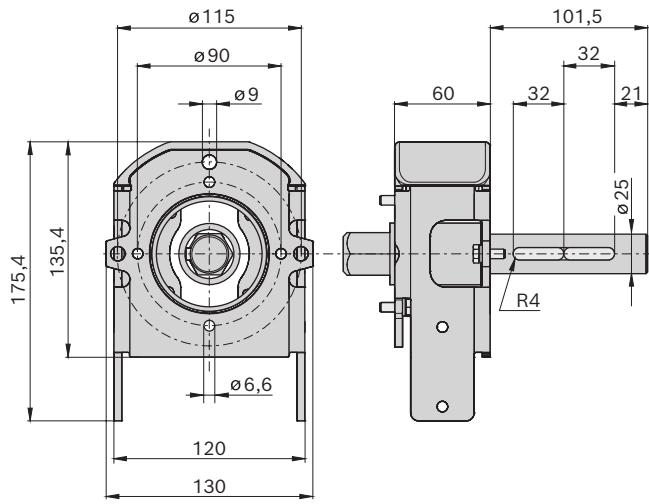
** v_N 60-120 on request

STS GM = 0



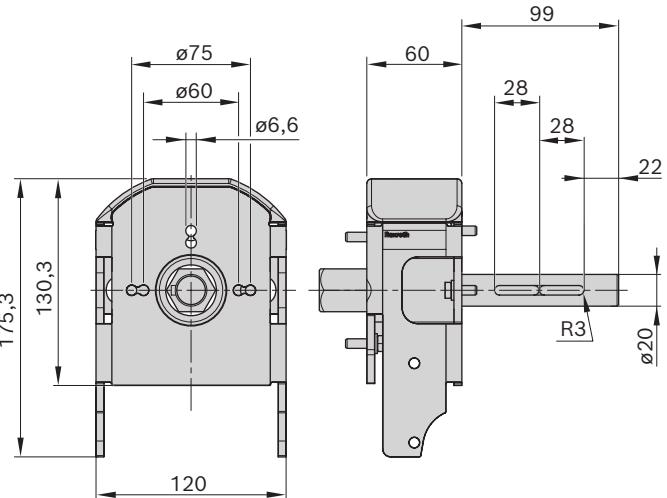
25603

STS GM = 2



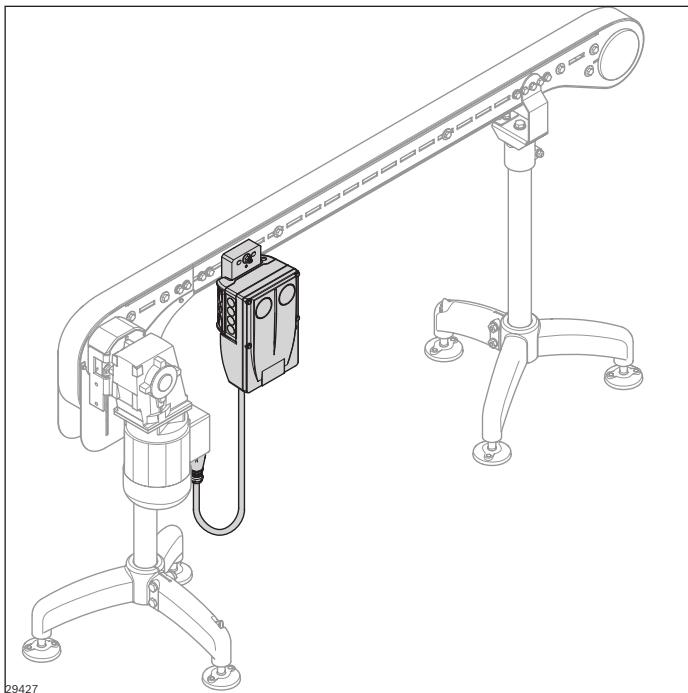
25604

STS GM = 4



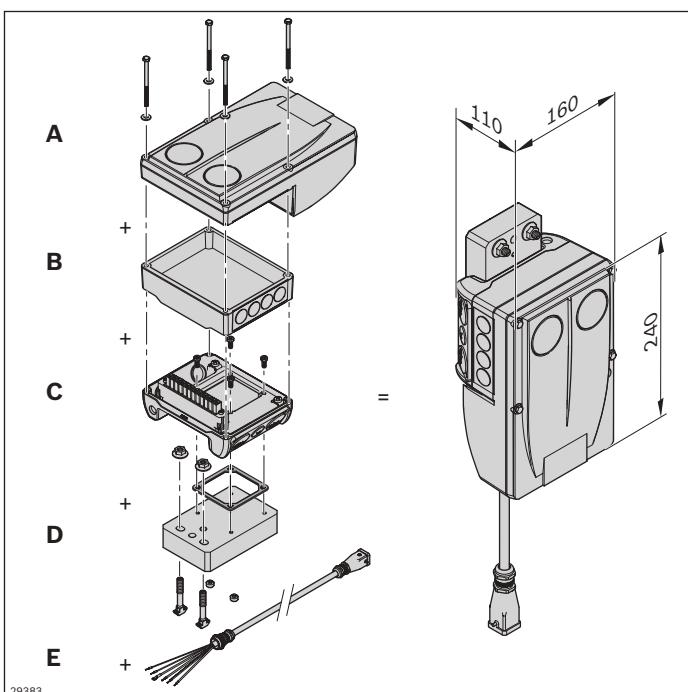
34701

Frequency converter motec 8400



In order to operate a gear motor with adjustable speed, the motor needs to be retrofitted with a frequency converter (FU). The frequency converter has a modular design, whereby it can be easily mounted on a section and connected to the motor by cable.

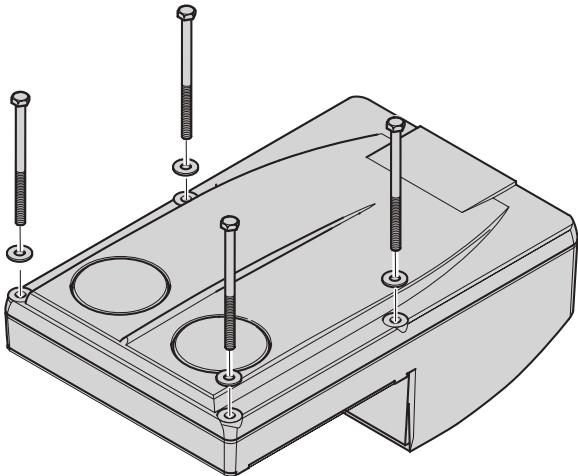
- Connection power: 0.55 kW
- Speed (v_N) depending on the base speed of the gear motor used



Complete frequency converter consisting of the modules

- Frequency converter power unit (A)
- Communication module (B)
- Connection unit (C)
- Attachment kit (D)
- Optional: Connection cable (E) for the plug-in connection to the gear motor (AT = S)

The individual modules can be ordered separately and are easy to connect with the screws supplied with the scope of delivery. For the internal and external voltage supply, the modules must be wired by the user (see terminal box assignment, p. 323).

A

29384

Frequency converter (A)

Power unit: 0.55 kW

3/PE AC 320 V -0 % ... 528 V +0 %,

45 Hz -0 % 65 Hz +0 %

- Easy start-up via manual control unit
- Easy-to-replace memory module
- Large LED status indicator

Frequency converter	No.
0.55 kW power unit	3 842 553 447

The speed range of the frequency converter ^{*)} is based on the base speed of the motor:

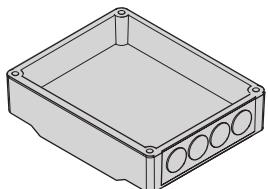
Motor speed range (m/min) at 50 Hz	Min ¹⁾ (m/min)	Max ²⁾ (m/min)
5 ³⁾	2	6
10 ³⁾	4	12
13	5	15
16	6	19
21	7	25
27	9	32
33	11	39
40	13	48
50	16	60

^{*)} By accepting a resulting loss of power, a higher bandwidth can be covered (see p. 323)

¹⁾ Min corresponds to approx. 16 Hz supply frequency

²⁾ Max corresponds to approx. 60 Hz supply frequency

³⁾ At 460 V/60 Hz max (m/min) 20 % higher

B

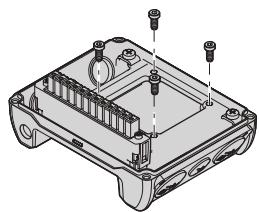
29385

Communication module (B)

- Used to control the frequency converter
- Cable connection options
- Standard version without "integrated safety system STO (safety torque off)" (available on request)

Depending on their function, the individual communication modules are provided with the corresponding connections.

Communication module	No.
Standard I/O	3 842 553 449
AS-i	3 842 553 453
CANopen	3 842 553 454
EtherNet/IP	3 842 553 451
EtherCAT	3 842 553 459
PROFIBUS	3 842 553 452
PROFINET	3 842 553 450

C

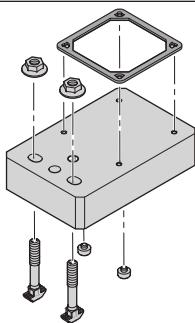
29386

Connection unit (C)

- Power grid connection options

Connection unit**No.**

3 842 553 445

D

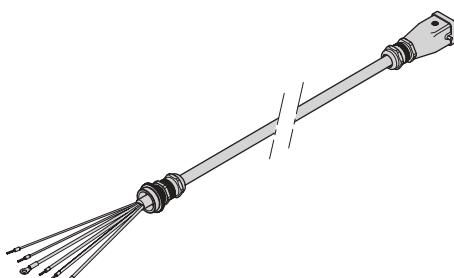
29387

Attachment kit (D)

- For the simple attachment of the frequency converter to the STS section

Attachment kit**No.**

3 842 553 457

E

29426

Connection cable (E)

- For connecting the gear motor to the frequency converter (length: 1 m)
- For the drive kit AT = S (direct wiring with AT = K)

Connection cable**No.**

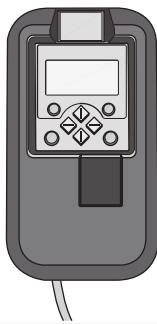
3 842 553 512

4

Manual control unit



A



29416

Manual control unit

The manual control unit is required for the parameterization of drives with frequency converters.

In addition, you can:

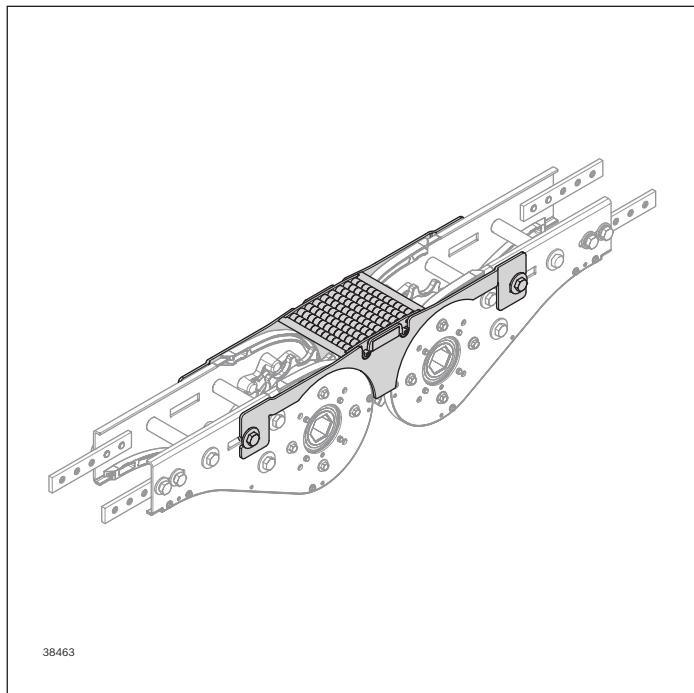
- Control (e.g. block and release)
- Display operating data
- Steplessly regulate the transport speed
- Transfer parameter sets to other basic devices

Manual control unit

No.

3 842 552 821

Passive bridge connection kit



The passive bridge is used as a transfer unit between the basic unit and return unit or with the connection drive to bridge the conveyor trench.

- Size 65-120: Only for flat conveyor chain and static friction chain
- Size 160: Only for flat chain t7
- For dimensionally stable products with an even transport surface
- Height adjustment: approx. 2 mm
- The conveyed goods are transferred via passive rollers
- Suitable for goods from approx. 300 mm length

- ▶ Can be retrofitted into a standard configuration at any time

Scope of delivery:

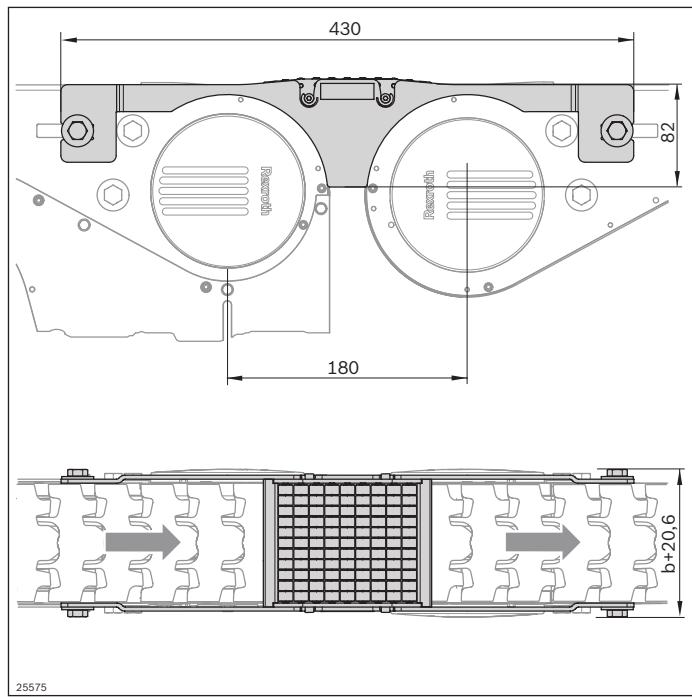
- Incl. fastening material

Material:

- Non-rusting steel 1.4301, POM

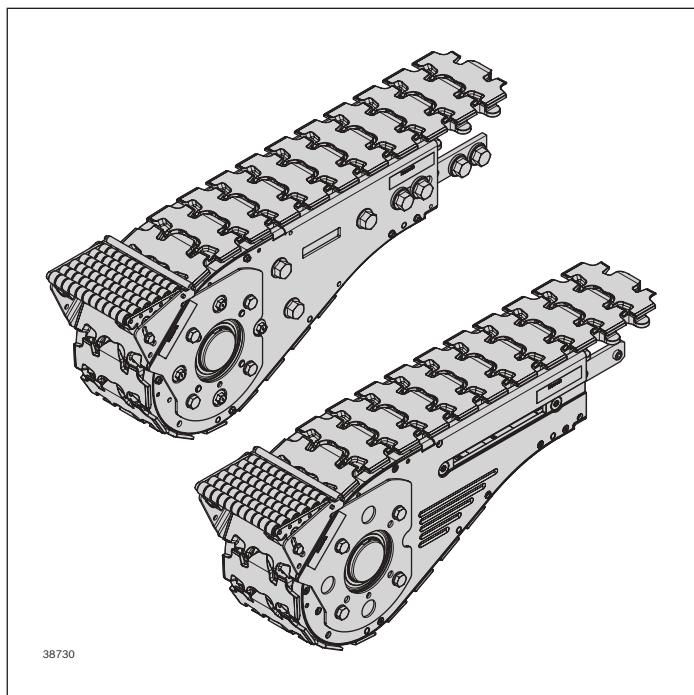
Condition on delivery:

- Some assembly required

**Passive bridge connection kit****No.**

VFplus 65	3 842 549 015
VFplus 90	3 842 549 016
VFplus 120	3 842 549 017
VFplus 160	3 842 549 018

Short passive bridge connection kit



The short passive bridge is used as a transfer unit between the basic unit or return unit and a third-party conveyor to bridge the conveyor trench.

- Each in a separate version for a flat conveyor chain and static friction chain
- For dimensionally stable products with an even transport surface
- The conveyed goods are transferred via passive rollers
- Suitable for goods from approx. 150 mm length
- Inclination adjustment $\pm 15^\circ$ (only the gradient)

- ▶ Can be retrofitted into the basic unit and return unit at any time (cannot be combined with the transmission kit)
- ▶ Suitable for mounting on AL and STS

Scope of delivery:

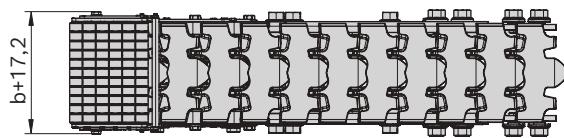
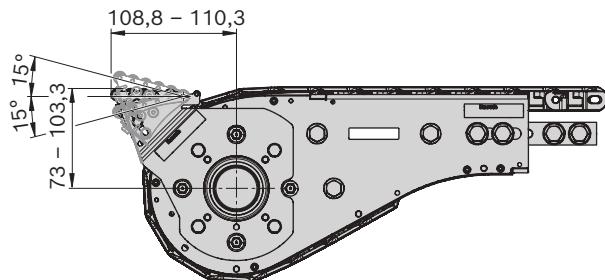
- Incl. fastening material

Material:

- Non-rusting steel 1.4301, POM

Condition on delivery:

- Some assembly required



35631

**Short passive bridge connection
kit for flat conveyor chain**

No.

VFplus 65	3 842 558 050
VFplus 90	3 842 558 051
VFplus 120	3 842 558 052

**Short passive bridge connection
kit for static friction chain**

No.

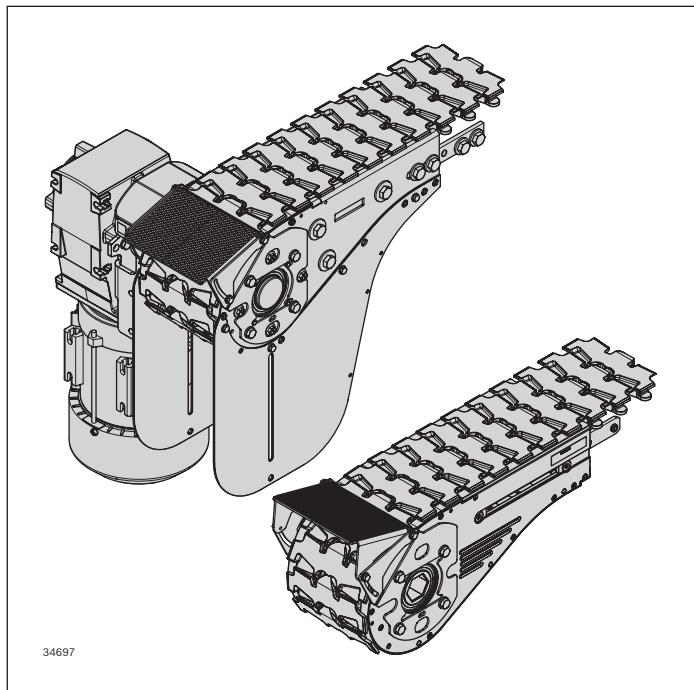
VFplus 65	3 842 558 078
VFplus 90	3 842 558 079
VFplus 120	3 842 558 080

**Short passive bridge connection
kit for flat conveyor chain t7**

No.

VFplus 160	3 842 558 081
------------	----------------------

Short sliding bridge connection kit



The short sliding bridge is used as a favorably priced, linear transfer unit between the basic unit or return unit and a third-party conveyor to bridge the conveyor trench.

- Suitable for conveyed materials from approx. 80 mm in length (depending on the angle of inclination, speed, position of the center of gravity, geometry, product friction, ...)
- The material to be conveyed is transferred via a corrugated metal sheet with an inclination adjustment of $\pm 15^\circ$ (gradient only)
- Size: 65-320
- Version for flat conveyor chain
- Due to potential deflection with even weight distribution, max. loading of sizes 240 and 320 limited to:
 - Size 240: 6 kg
 - Size 320: 5 kg
 - For products with a low bridge width, the maximum loading capacity is reduced: Request, test required

- ▶ Can be retrofitted into the basic unit and return unit at any time (cannot be combined with the transmission kit)

Scope of delivery:

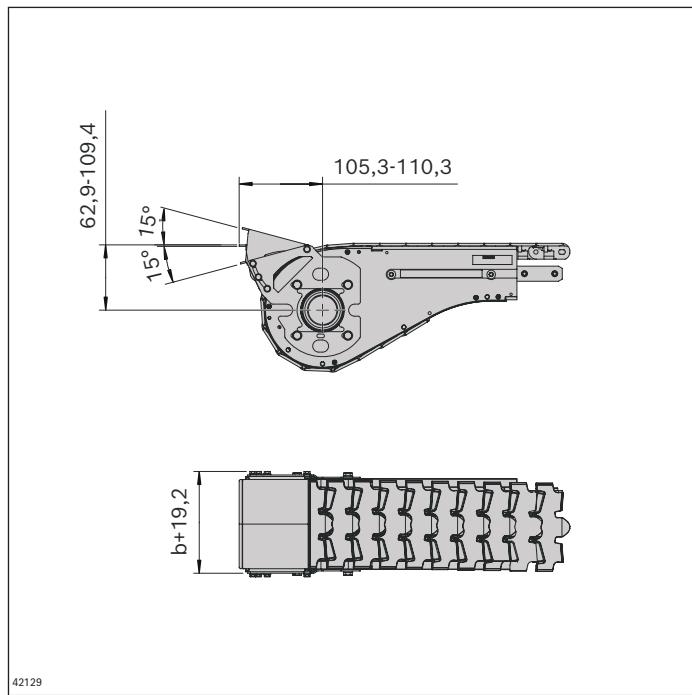
- Incl. fastening material

Material:

- Non-rusting steel 1.4301

Condition on delivery:

- Some assembly required



**Short sliding bridge connection
kit for flat conveyor chain**

No.

VFplus 65	3 842 571 170
VFplus 90	3 842 571 171
VFplus 120	3 842 571 172

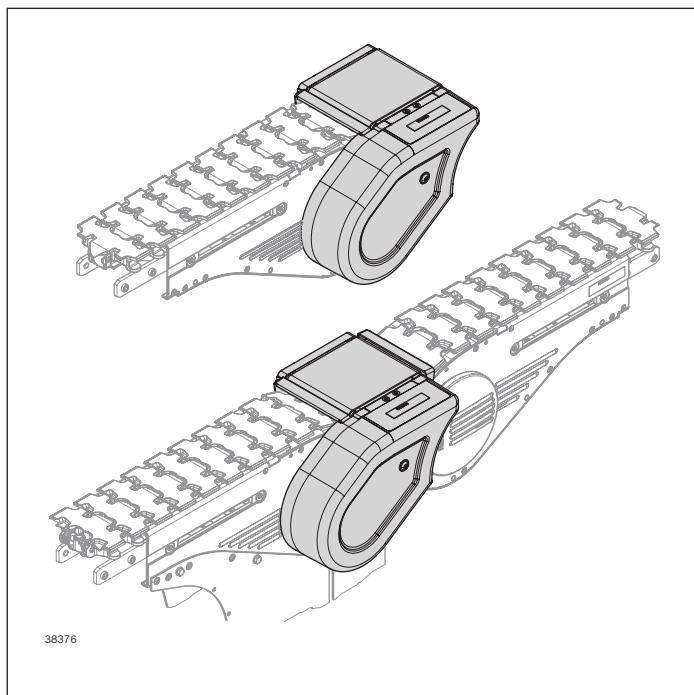
**Short sliding bridge connection
kit for flat conveyor chain t7**

No.

VFplus 160	3 842 571 206
VFplus 240	3 842 571 207
VFplus 320	3 842 571 208

Short sliding bridge connection kit for static friction chain
on request

Active belt bridge connection kit



- ▶ Simple transmission of the drive force using hexagonal hollow shafts integrated into the base unit or return unit as standard
- ▶ Can be retrofitted into a standard configuration at any time
- ▶ Easy replacement of the belt from the top

Scope of delivery:

- Incl. fastening material
- Transmission and protective cover

Material:

- Aluminum, non-rusting steel 1.4301, PA, PE, ABS, PUR

The active belt bridge is used as a transfer unit for bridging the conveyor trench

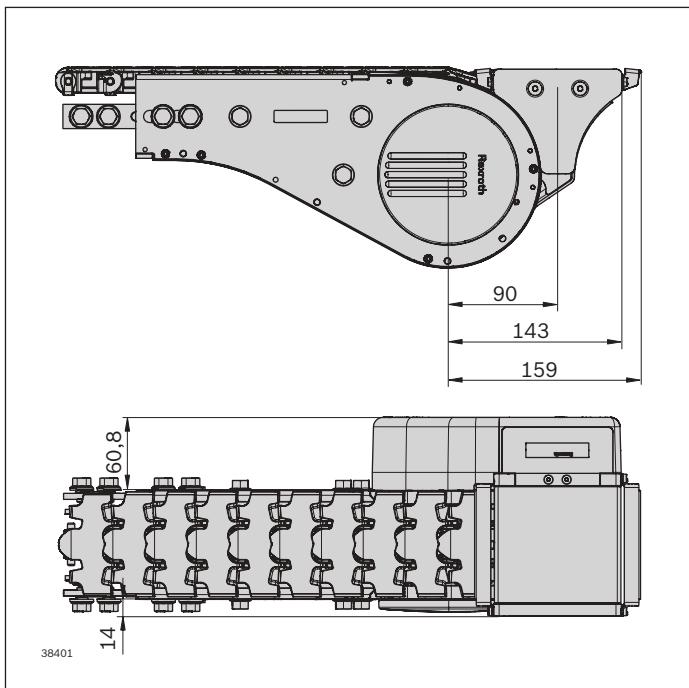
- between the basic unit and return unit
- between the start or end of a conveyor section and a third-party conveyor
- in the connection drive
- Size 65-120: Only for flat conveyor chain and static friction chain
- Size 160: Only for flat chain t7

The active belt bridge is driven by a transmission (on the drive or return side).

- Suitable for conveyed materials from approx. 80 mm in length (depending on the speed, position of the center of gravity, product friction, etc.)
- Installation possible on both the drive and return side (make sure to use the correct L/R version)
- Not permitted for wet operation, rough ambient conditions or sharp-edged products
- Load depending on the speed (see diagram)
- The speed of the adjacent conveyor should be approximately the same to prevent premature wear
- Accumulation not permitted

Condition on delivery:

- Some assembly required


Active belt bridge connection kit

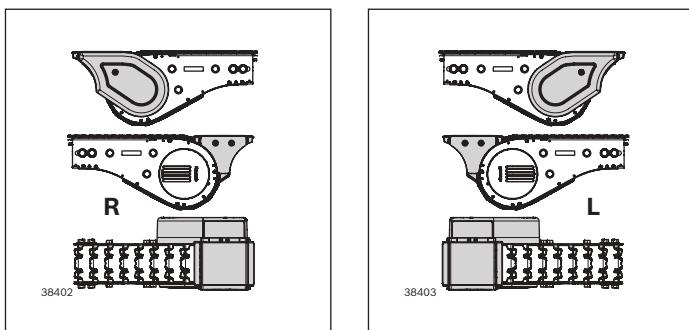
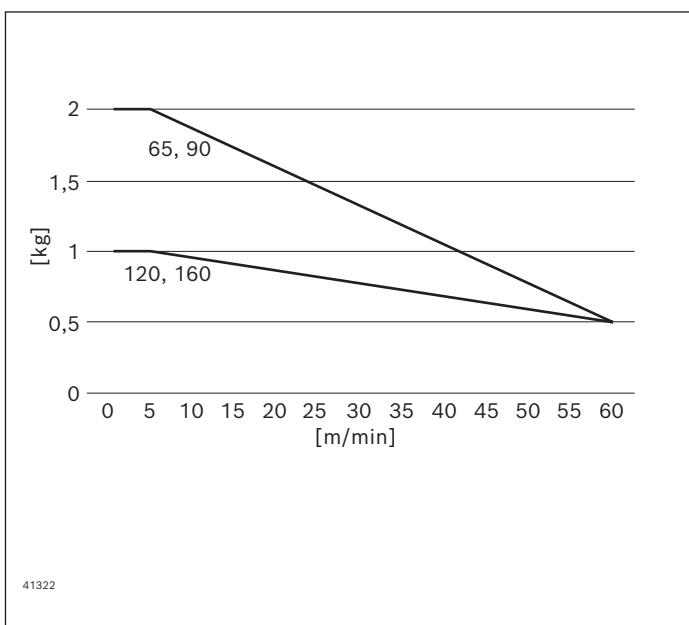
No.

VFplus 65	L	3 842 558 000
VFplus 65	R	3 842 558 001
VFplus 90	L	3 842 558 002
VFplus 90	R	3 842 558 003
VFplus 120	L	3 842 558 004
VFplus 120	R	3 842 558 005

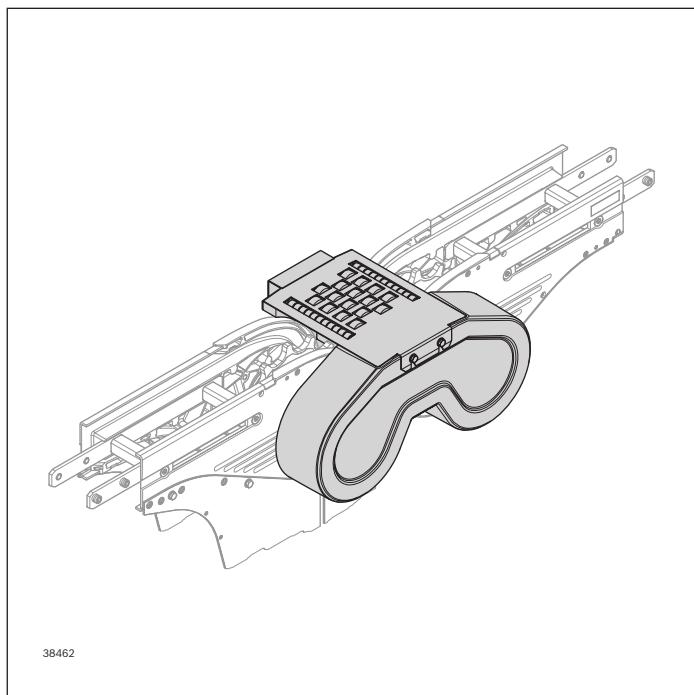
Active belt bridge connection kit for flat chain t7

No.

VFplus 160	L	3 842 558 006
VFplus 160	R	3 842 558 007


Permissible load depending on the speed


Active roller bridge connection kit



The active roller bridge is used as a transfer unit between the basic unit and return unit or with the connection drive to bridge the conveyor trench.

The active roller bridge is driven by a transmission (on the drive or return side).

- Size 65-120: Only for flat conveyor chain and static friction chain
- Size 160: Only for flat chain t7
- For dimensionally stable products with an even transport surface
- Height adjustment: approx. 2 mm
- Additional versions (e.g. machine variants at the section end) available on request
- Suitable for conveyed materials from approx. 100 mm in length (depending on the speed, position of the center of gravity, product friction, etc.)
- Freely selectable mounting position (L/R)
- Not permitted for wet operation or rough ambient conditions
- Accumulation not permitted

► Simple transmission of the drive force using hexagonal hollow shafts integrated into the base unit or return unit as standard

Scope of delivery:

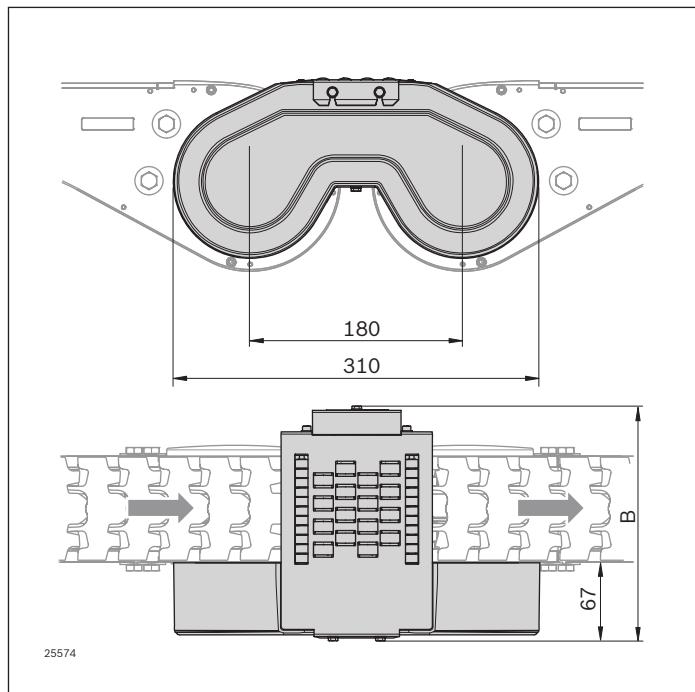
- Incl. fastening material
- Transmission and protective cover

Material:

- Non-rusting steel 1.4301, PA, POM, ABS, PUR

Condition on delivery:

- Some assembly required

**Active roller bridge connection kit****B** **No.**

VFplus 65	174	3 842 555 820
VFplus 90	199	3 842 555 821
VFplus 120	229	3 842 555 822

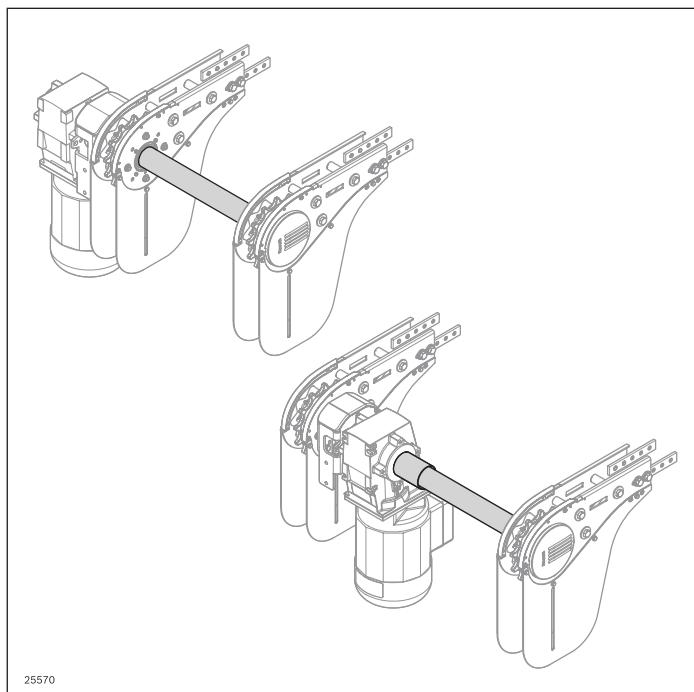
Active roller bridge connection kit for flat chain t7**B** **No.**

VFplus 160	269	3 842 555 823
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4

Connection kit

Synchronous drive, external motor/internal motor



The connection kit for a synchronous drive is used to synchronously drive two conveyor sections with only one motor.

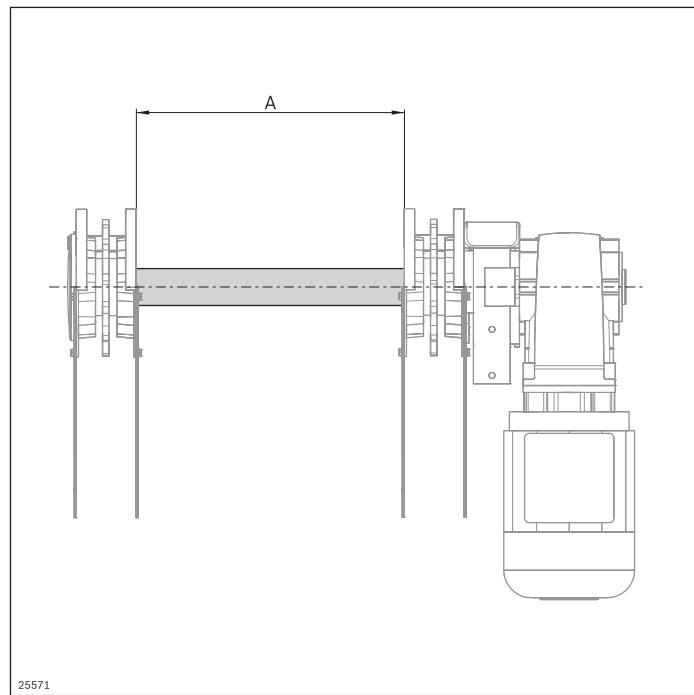
- Exterior synchronous drive:
 - Motor mounting position outside the parallel sections
- Internal synchronous drive:
 - Motor mounting position between the parallel sections for drive kit GM = 1 (see p. 168), customer check required for other motor types

Condition on delivery:

- Assembly required

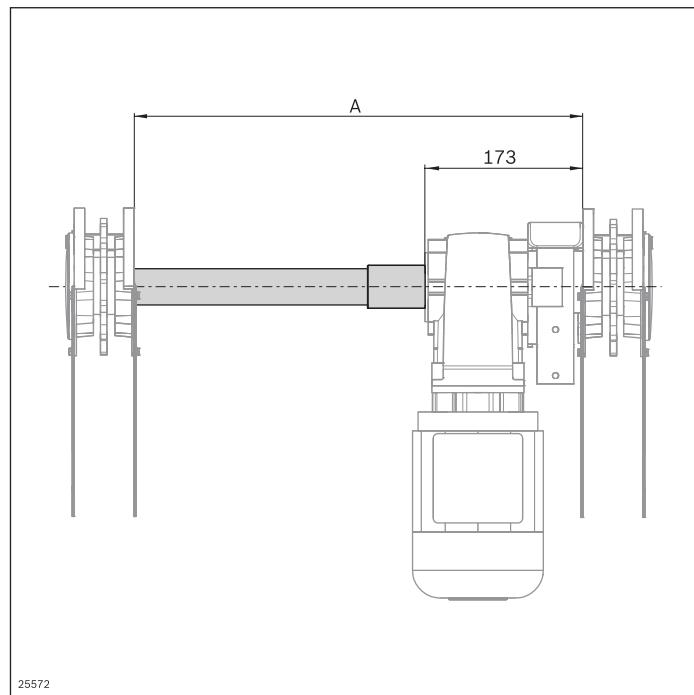
Material:

- Shaft: Non-rusting steel 1.4301
- Coupling: PA



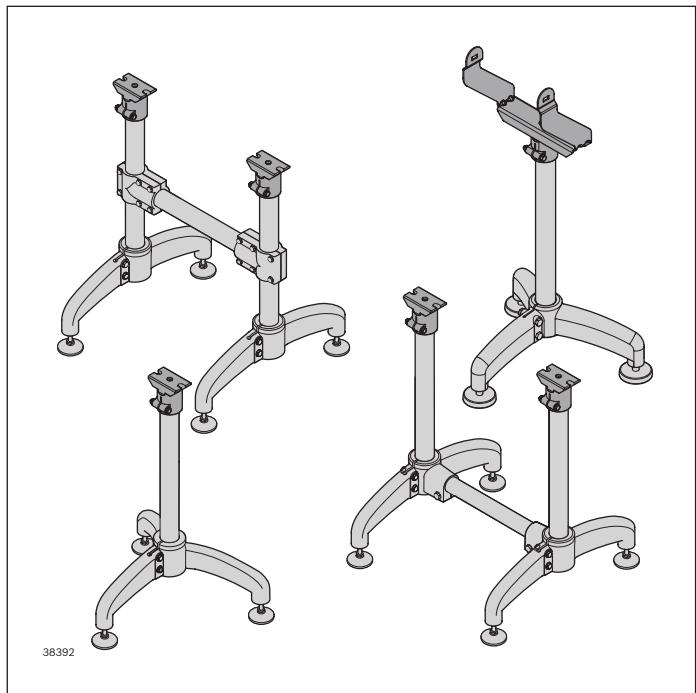
Synchronous drive connection kit	A (mm)	No.
VFplus external motor	10 ... 2940	3 842 998 774

4



Synchronous drive connection kit	A (mm)	No.
VFplus internal motor	240 ... 3160	3 842 998 775

Leg sets STS



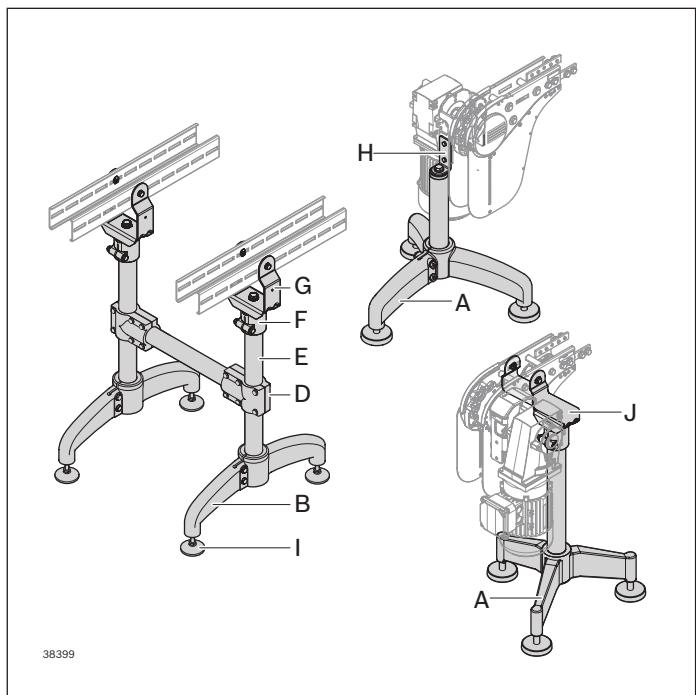
- ▶ Fast, simple leg set adjustment thanks to clever product details
- ▶ Few screwed connections
- ▶ Easy to clean thanks to ample draining surfaces
- ▶ Bore for the easy attachment of drip trays, protective devices, etc.
- ▶ Leg sets can also be used in conjunction with AL sections



Leg set STS

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Leg set STS



- ▶ For dowelling the leveling feet (I) drill guides are available on the underside
- ▶ Easy-to-clean design with draining surfaces

The chain conveyor is placed on the ground by means of leg sets and fastened.

The leg set is constructed from single parts:

Foot in three different versions (**A, B, C**)

Tube (**E**), flange (**F**) for mounting the holder and holder (**G**) for mounting the section profile.

It is imperative that a separate holder (**J**) is used to support the motors/drives. Holder (**H**) as an additional or optional support on the flange.

- Depending on the speed, accumulation behavior and weight, the leg sets are to be fixed at a distance of approx. 2 ... 3 m
- The leg sets for the aluminum system (see p. 120, 124) can also be used on the stainless steel system. The holders (**G+J**) can be connected directly to a strut profile 60x60 and a S12x30-T50 (MGE catalog **3 842 530 236**)
- Holders (**J+H**) can only be used for the STS system
- Holder (**G**) can also be used for ascending and descending conveyor sections (up to approx. 28°, depending on the return chain)
- Holder (**G**) with drill guide to fasten drip trays, trap guards for return chains etc., also suitable for section profile 60x60
- Due to stability reasons, cross reinforcements are absolutely necessary when using feet B and C

Scope of delivery:

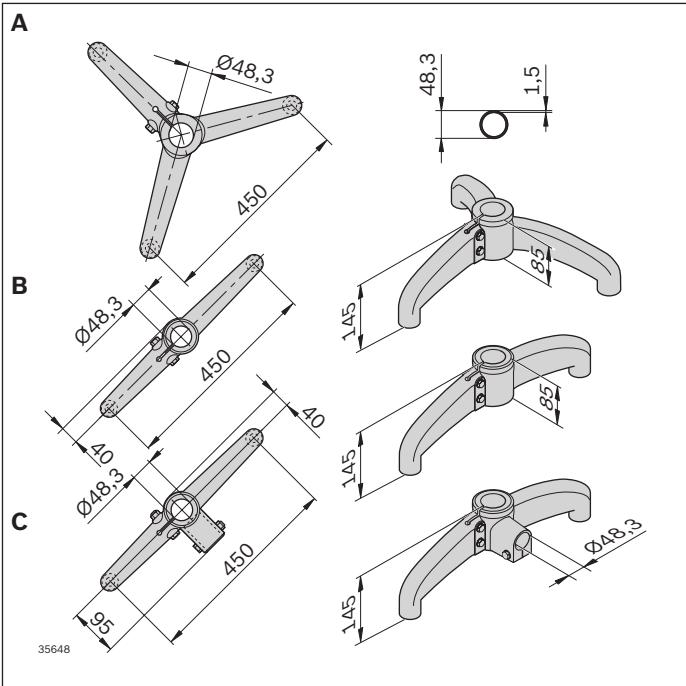
- Incl. fastening material
- **I:** without lock nut

Material:

- **A, B, C, D, F:** PA
- **E, G, J:** Non-rusting steel 1.4301
- **H:** Non-rusting steel 1.4301 with PA
- **I:** STS with PA

Condition on delivery:

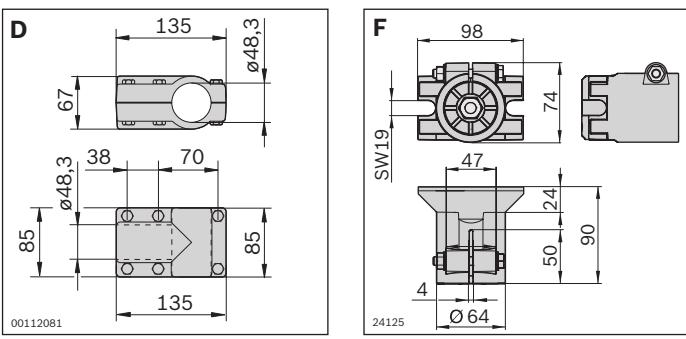
- Assembly required

**Foot STS**

		No.
Tripod (A)	1	3 842 533 307
Bipod (B)	1	3 842 533 308
Two-leg with flange (C)	1	3 842 533 309

Tube D48.3 x 1.5 STS (E)

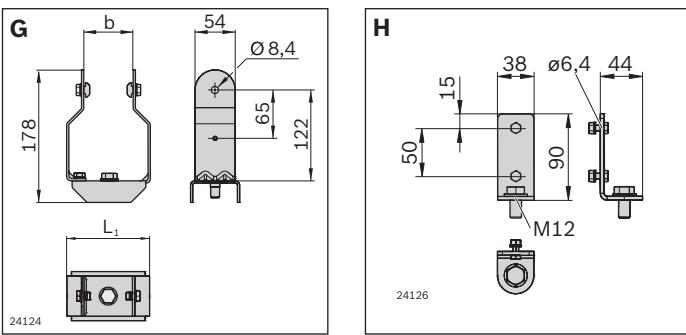
	L (mm)	No.
6 pcs	3000	3 842 533 901
1 pc	200 ... 3000	3 842 993 308/L

**Cross connector (D)**

		No.
VFplus 80x80, black	1	3 842 533 306

Flange VFplus STS (F)

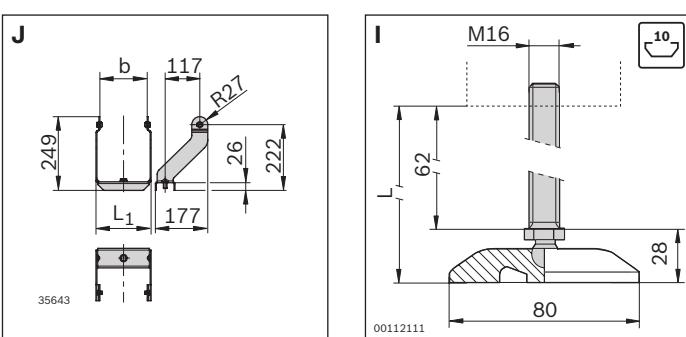
		No.
VFplus support	Set	3 842 547 892

**Holder STS (G)**

	b (mm)	L ₁ (mm)		No.
VFplus 65 support STS	65	111	Set	3 842 546 658
VFplus 90 support STS	90	136	Set	3 842 546 659
VFplus 120 support STS	120	166	Set	3 842 546 660
VFplus 160 support STS	160	206	Set	3 842 546 661
VFplus 240 support STS	240	286	Set	3 842 546 662
VFplus 320 support STS	320	366	Set	3 842 546 663

Holder motor leg set STS (H)

		No.
VFplus	Set	3 842 549 365

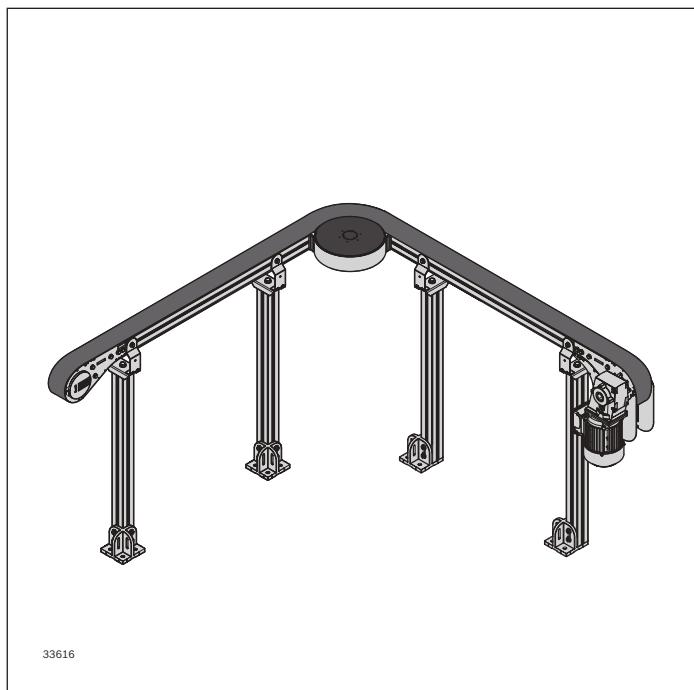
**Holder STS (J)**

	b (mm)	L ₁ (mm)		No.
VFplus 65 drive STS	65	91	Set	3 842 559 114
VFplus 90 drive STS	90	116	Set	3 842 559 115
VFplus 120 drive STS	120	146	Set	3 842 559 116
VFplus 160 drive STS	160	186	Set	3 842 559 117
VFplus 240 drive STS	240	266	Set	3 842 559 118
VFplus 320 drive STS	320	346	Set	3 842 559 119

Leveling foot (I)

		No.
Adjustable M16x95		3 842 533 310

VarioFlow plus ESD system



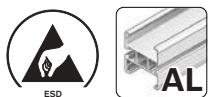
- ▶ Components and parts suitable for use in an EPA (ESD Protected Area)
- ▶ Conductive components
- ▶ Dissipative connection technology
- ▶ Size: 65, 90
- ▶ Max. speed: 30 m/min
- ▶ Max. chain tensile force: 600 N

Notice:

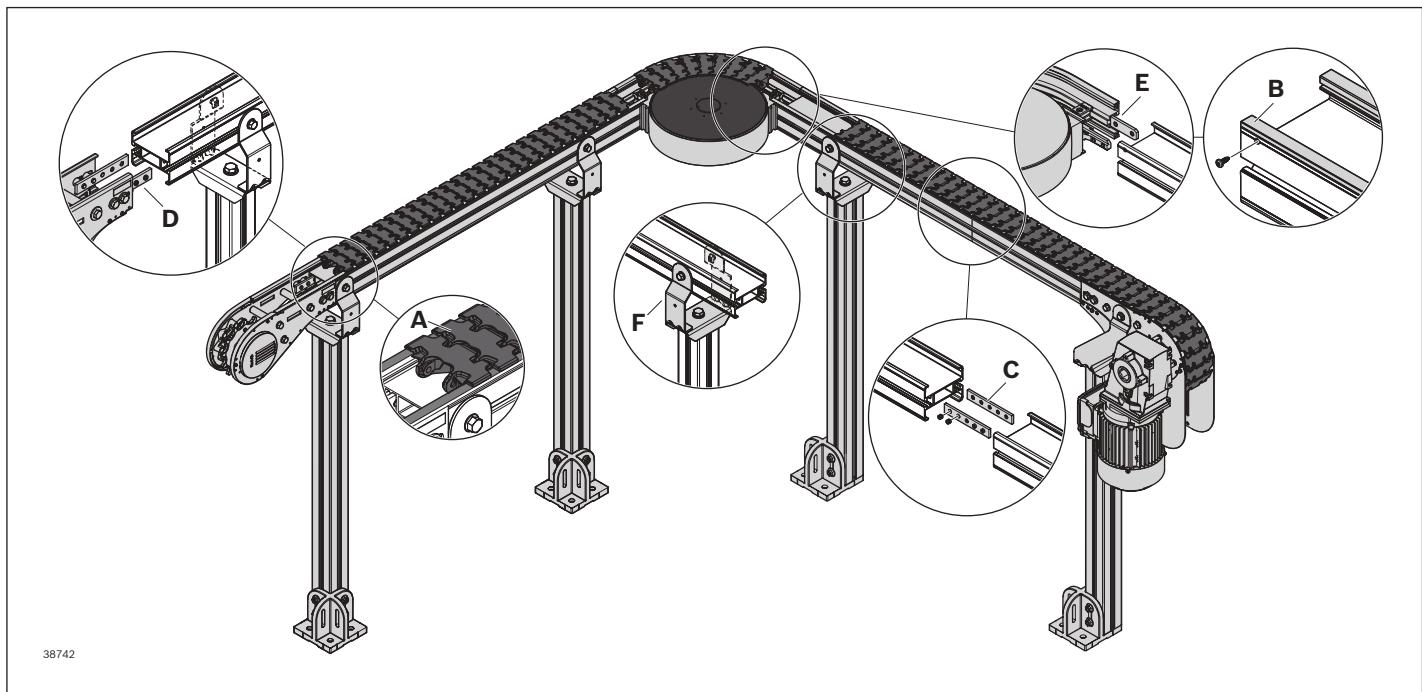
Because sliding friction is involved with the transport medium (chain), static charges cannot be completely avoided. Depending on customer requirements, additional measures may be necessary.

	Assembly of an ESD system	194
	Conveyor chain ESD	198
	Sliding rail ESD	200
	Curve wheel AL ESD	202
	Drive and return unit ESD	204
	Basic unit Curve wheel drive AL ESD	206
	Adapter AL-STS	210
	Leg set ESD Motor leg set ESD	212

Assembly of an ESD system



The ESD system comprises a combination of AL, STS and special ESD components.



- ▶ **A:** The conveyor chain ESD is deflected to the sliding rail ESD via the extensive support.
- ▶ **B:** The sliding rail ESD is deflected to the AL section profile (see p. 54) via the side standard mount¹⁾
- ▶ **C:** The AL section profile is mounted using the AL profile connector¹⁾
- ▶ **D:** The STS drive/return unit are mounted on the AL section profile using the AL-STS adapter¹⁾.
The use of the STS drive/return unit instead of the AL version is necessary to minimize the load creation

- ▶ **E:** The AL ESD curve wheel (see p. 202) is screwed with the AL section profile¹⁾
- ▶ **F:** The AL leg sets are mounted on the AL section profile via STS holders (screws in the slot)¹⁾

¹⁾ T-bolts, nuts and self-tapping screws break through the anodized layer and form a connection to the conductive aluminum core.

Notice:

When assembling an ESD system, ensure that all components are conductively connected to each other. Horizontal sliding curves are not suitable for use in an EPA due to the high friction.

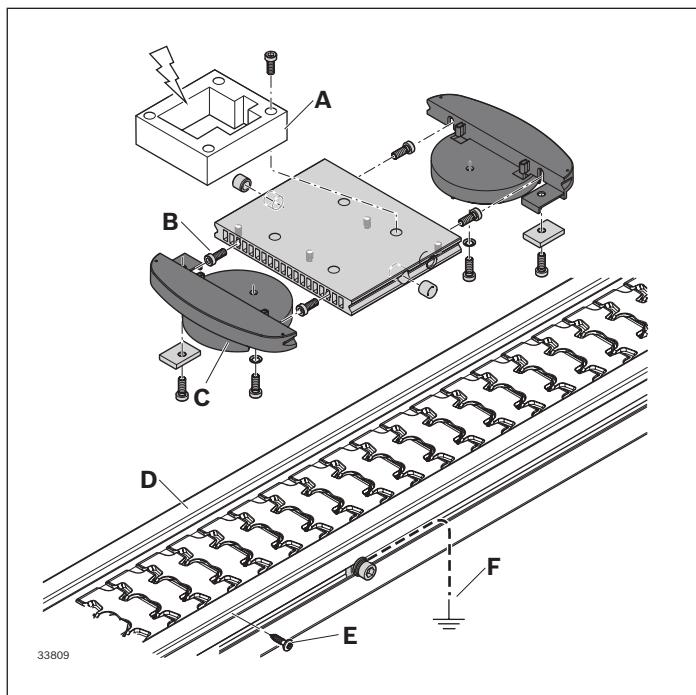
In an environment designed for ESD, all components should be made from volume or surface conductive material. Since this is not always possible in the VarioFlow *plus* system for technical and economic reasons, the occurrence of charges (that are strongly dependent on the humidity - 40% minimum should not be fallen short of) cannot be completely excluded for certain components.

No ESD critical processes should be carried out in the vicinity of components such as drives, return units, or bridges. You should move processing-related processes into straight sections and design the complete system according to what your ESD coordinator thinks.

Charges occurring can be discharged through the use of conductive brushes. For machining processes involving particularly sensitive parts, there are numerous components that can be found in Rexroth's Manual Production Systems product range with which individual workstations can be integrated in a VarioFlow *plus* system. These workstations can be implemented, both simply and economically, as completely conductive "islands" according to the ESD requirements.

Caution:

Personal safety always comes before ESD safety!

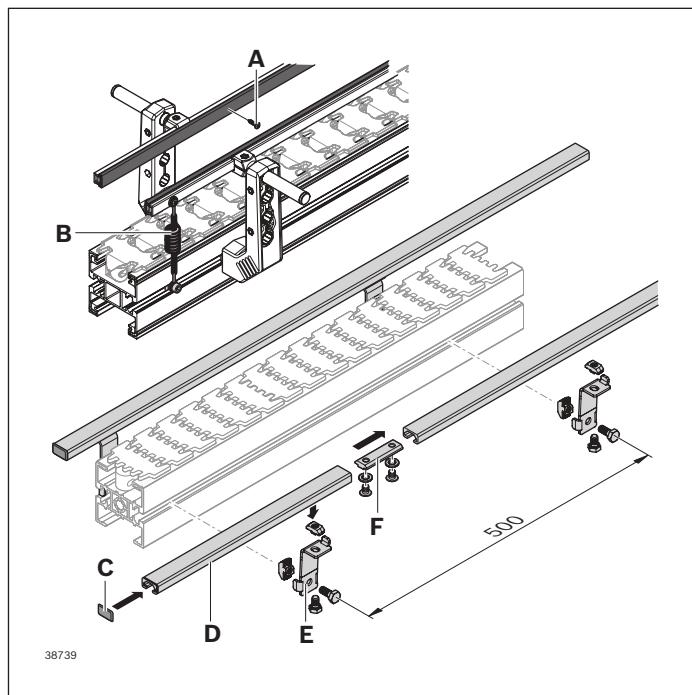


Workpiece pallets

- Product carrier connection made of metal or conductive plastic connections to the WT plate via screw (**A**) (pierced anodized coating)
- Connection to the end caps and the steel wear pad via screws (**B**)
- Connection to the conveyor chain via a large contact area (**C**)
- Connection between the conveyor chain and the sliding rail via a large contact area (**D**)
- Sliding rail connection with section profile via screws (**E**)
- Example connection to the hall potential equalizer with a $1\text{ M}\Omega$ protective resistor (**F**)

Notice:

Only the steel wear pad is ESD capable.



Product guide

- Sliding rail connection narrow with AL profile rail via sheet metal screw (3 842 547 908) (A)
- Connection between AL profile rail - section profile using a screw (3 842 547 908 or 3 842 533 915), cable and T-nut (B) (piercing through the anodized coating and establishing a connection to the conductive aluminum core)

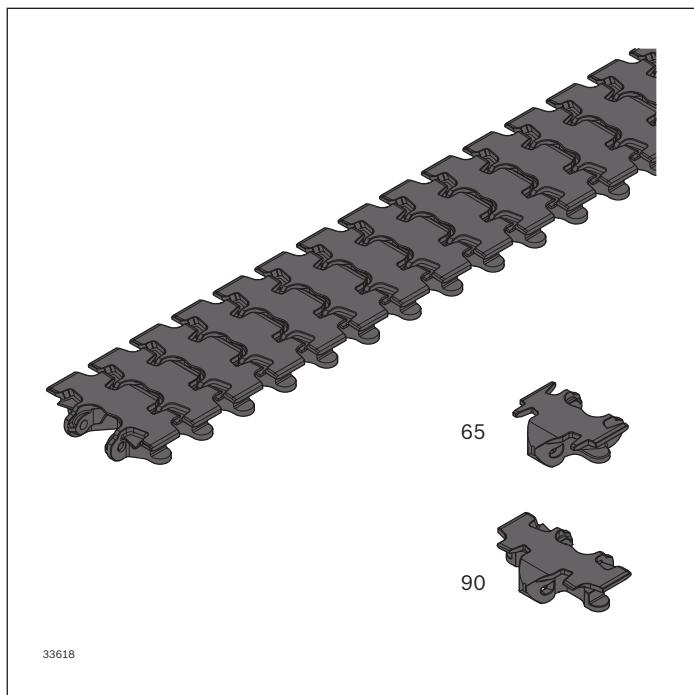
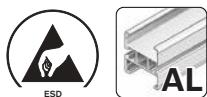
Workpiece pallet product guide

- Connection of lateral guide profile (D) with holder (E) using T-nuts (broken eloxal layer)
- Connection between 2 lateral guide profiles via profile connector (F) with T-nuts (broken anodized layer)

Notice:

The extension of the AL profile rail is only permitted with the profile connector on the outside (see p. 228).

Conveyor chain ESD



The conveyor chain ESD is used to transport products directly or indirectly via workpiece pallets in electrostatically dissipative systems.

- Transport on ascending or descending sections up to about 7° possible, depending on the product (test required)
- Accumulation operation permitted, depending on the product
- Maximum chain tensile force: 600 N
- Conduction resistance: $< 10^8 \Omega$
- Size: 65, 90
- A combination with other types of chains is not permitted, since these are non-conductive

- Drilling the flat conveyor chain links allows for the simple attachment of superstructures.
A mold cavity for accommodating a flat M5 hexagon nut/screw is available.
Max. drilling up to Ø 5 mm since at this point there are no interfering contours in the chain conveyor.

Required accessories for individual chain links:

- Chain pin and pivot pin, see p. 199

Scope of delivery:

- Chain: complete, incl. chain pin and pivot pin

Material:

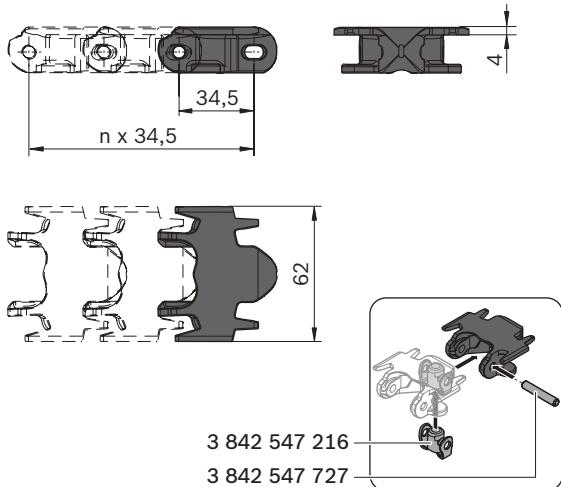
- Chain link: POM; black
- Chain pin: Non-rusting steel 1.4301
- Pivot pin: PA66

- Extremely quiet chain running thanks to the patented chain design

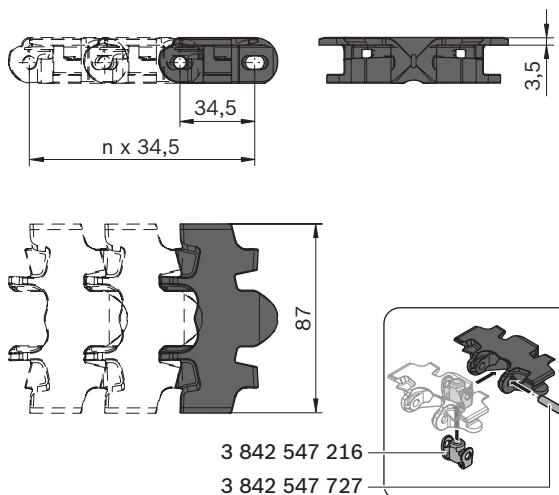
Condition on delivery:

- Chain: Fully assembled

Conveyor chain ESD VFplus 65 L (mm)	 No.
Conveyor chain	4968 1 3 842 546 088
Chain pin	100 3 842 547 727
Pivot pin	100 3 842 547 216



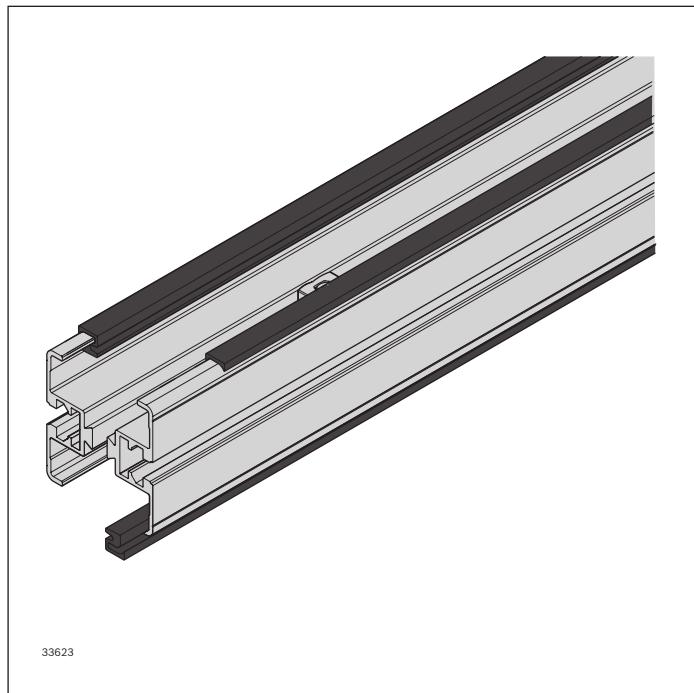
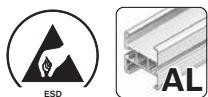
33622



33621

Conveyor chain ESD VFplus 90 L (mm)	 No.
Conveyor chain	4968 1 3 842 546 089
Chain pin	100 3 842 547 727
Pivot pin	100 3 842 547 216

Sliding rail ESD



- ▶ Easy assembly - simply clip onto the section profile
- ▶ Secured against axial shifting with lateral screw fittings
- ▶ Gliding surface machining: not required

Required accessories:

- Sliding rail assembly tool, see p. 300
- Sheet metal screw 2.9x9.5 DIN 7982; DIN EN ISO 7050
1x screw per sliding rail section

Material:

- PE-UHMW

The sliding rail ESD is clipped into the section profile and guides the conveyor chain.

Lateral securing means the sliding surface does not need to be machined. Wear and noise level are thus reduced to a minimum.

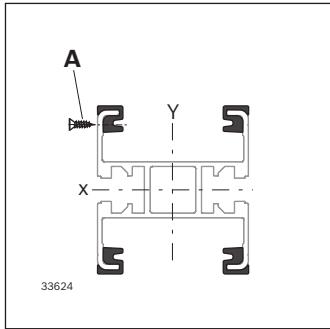
The ESD sliding rail screwed to the section profile helps to safely discharge loads.

- Size: 65, 90
- Only for AL systems
- V_{max} : 30 m/min
- Conduction resistance: $< 10^8 \Omega$
- Only suitable for dry operation

Extend the sliding rail over the component interfaces to ensure minimum wear and noise emissions.

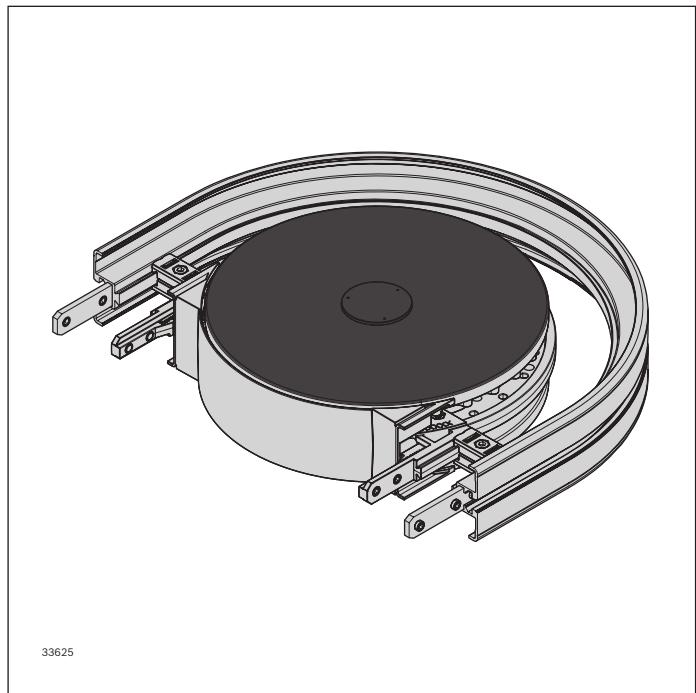
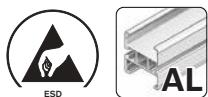
Interruptions to the profile or component connection must be avoided. If an interruption is necessary after 10 m and to ensure that charges are transferred safely, the sliding rail must be attached laterally with a sheet metal screw (**A**).

Notice: No horizontal sliding curves allowed.



Sliding rail ESD VFplus	L (mm)	 No.
	30000	1 3 842 557 000
<hr/>		
Sheet metal screw		 No.
A	100	3 842 547 908

Curve wheel AL ESD



- ▶ No interfering contours above chain plate height

Scope of delivery:

- Incl. fastening material for mounting to the section profile AL

Material:

- Housing: Diecast aluminum
- Chain wheel: PA ESD; black
- Ball bearing: Non-rusting steel 1.4301/FDA

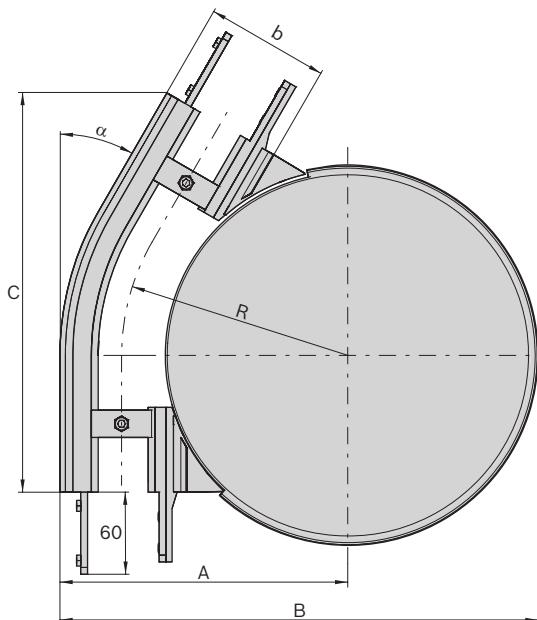
The curve wheel AL ESD provides a horizontal direction change for the conveyor chain. It enables low-friction direction changes with very small radii. For attachment options, see the matrix on page "Combination matrix" on page 329

- Size: 65, 90
- Deflection angles see table on page 203, other deflection angles on request
- Suitable chain type: Conveyor chain ESD
- For circuit systems without conveyor chain return in bottom run (using a curve wheel or connection drive), the appropriate cover must be used for personal safety reasons
- With conductive wheel

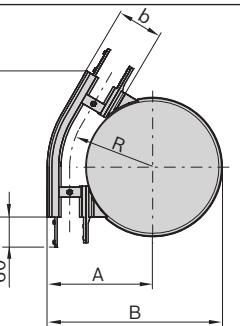
Notice: High-pressure cleaning of the ball bearings is not permitted.

Condition on delivery:

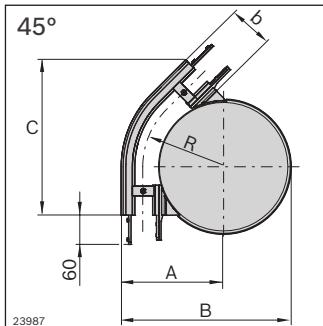
- Assembled



23984

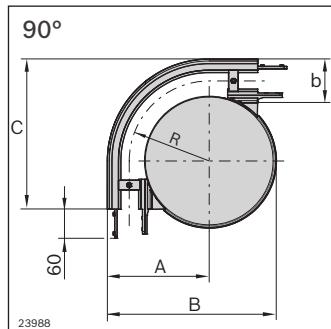


23986

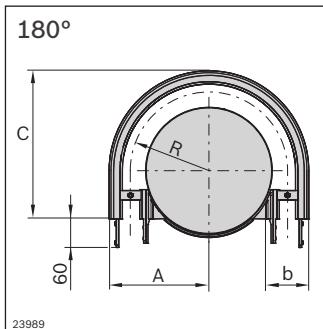


23987

Curve wheel AL ESD	α (°)	No.
VFplus 65	30	3 842 553 029
	45	3 842 553 030
	90	3 842 553 031
	180	3 842 553 032
VFplus 90	30	3 842 553 033
	45	3 842 553 034
	90	3 842 553 035
	180	3 842 553 036

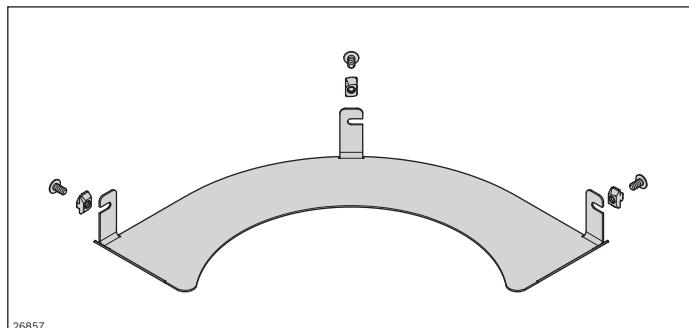


23988



23989

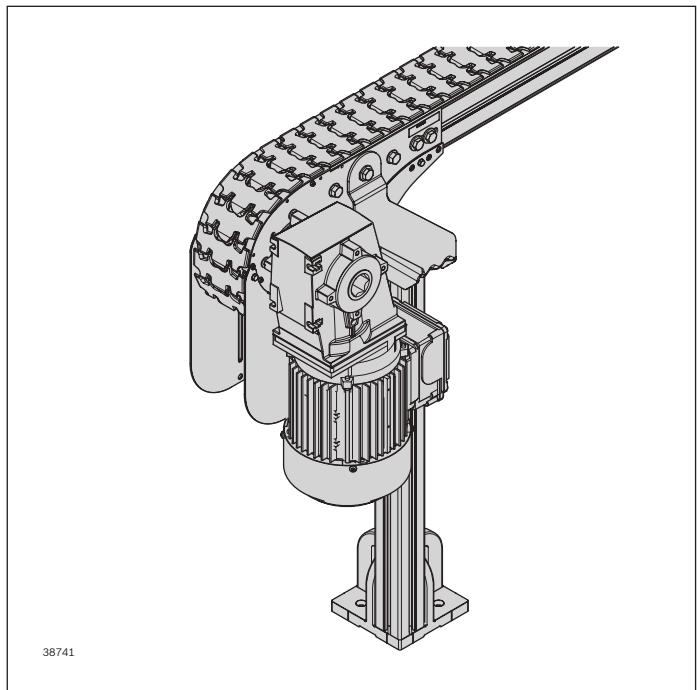
b (mm)	α (°)	R (mm)	A (mm)	B (mm)	C (mm)
65	30	153.0	185.5	324.5	279.4
	45	153.0	185.5	324.5	301.9
	90	153.0	185.5	324.5	285.5
	180	153.0	185.5	–	285.5
90	30	165.5	210.5	349.5	291.9
	45	165.5	210.5	349.5	319.6
	90	165.5	210.5	349.5	310.5
	180	165.5	210.5	–	310.5



26857

Protective cover AL	α (°)	No.
VFplus 65	30°	3 842 551 545
	45°	3 842 551 546
	90°	3 842 551 547
	180°	3 842 551 548
VFplus 90	30°	3 842 551 549
	45°	3 842 551 550
	90°	3 842 551 551
	180°	3 842 551 552

Drive and return unit ESD



Basic unit STS

(head drive direct, connection drive or center drive)

or return unit STS

+

Configurable drive kit STS

(standard gear motor or round shaft)

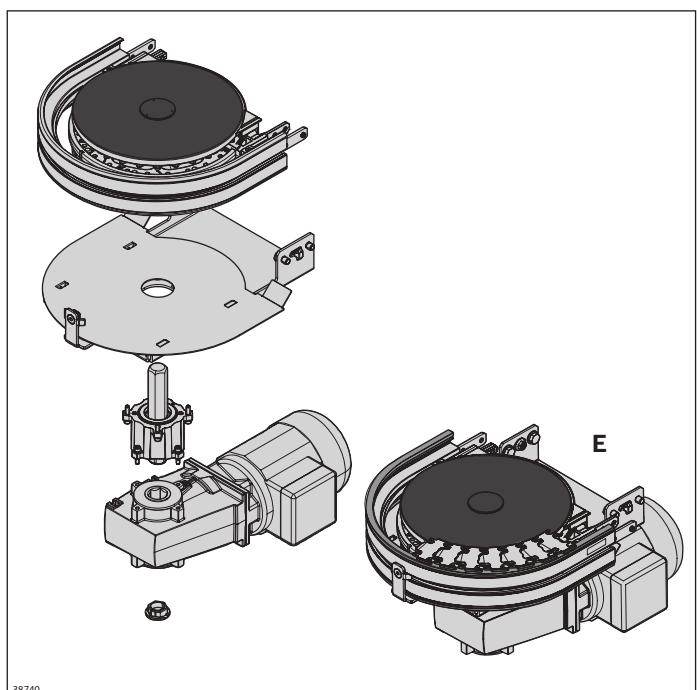
+

Adapter AL-STS

=

Complete drive for ESD systems

Notice: The active and passive bridges are not conductive, meaning that no ESD-critical processes should be carried out near bridges.



Basic unit curve wheel drive ESD

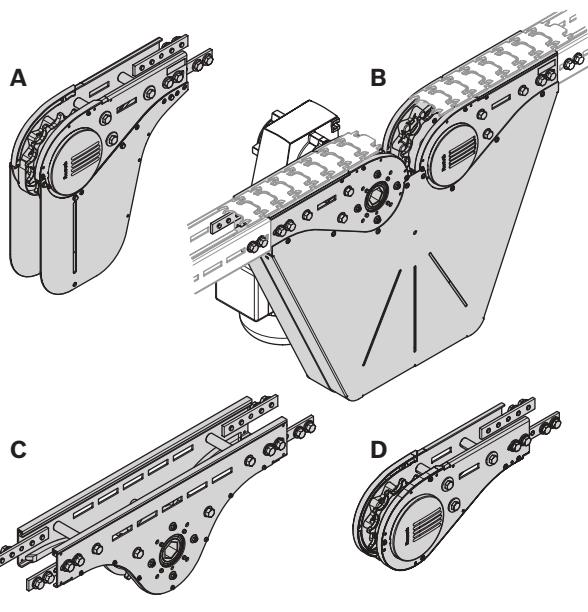
+

Configurable drive kit

(standard gear motor or round shaft)

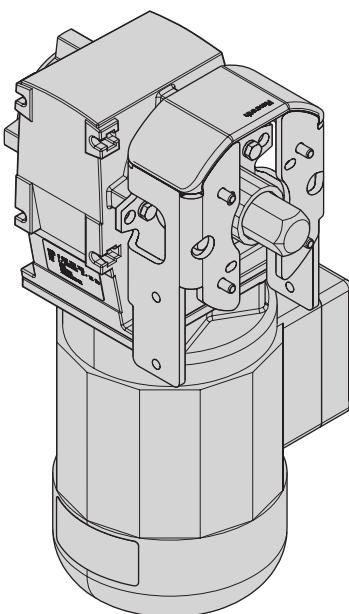
=

Complete drive



A Basic unit head drive direct, STS	No.
VFplus 65 direct	3 842 547 522
VFplus 90 direct	3 842 547 523
see p. 158	
B Basic unit connection drive STS	No.
VFplus 65 direct	3 842 553 914
VFplus 90 direct	3 842 553 915
see p. 160	
C Basic unit center drive STS	No.
VFplus 65 direct	3 842 552 940
VFplus 90 direct	3 842 552 941
see p. 162	
D Return unit STS	No.
VFplus 65	3 842 547 528
VFplus 90	3 842 547 529
see p. 164	

E Basic unit curve wheel drive ESD	No.
VFplus 65, 180°	3 842 553 037
VFplus 90, 180°	3 842 553 038
see p. 206	



Drive kit VFplus	SP	No.
	STS	3 842 998 291
SP = STS, see p. 168		
Drive kit curve wheel VFplus AL		No.
3 842 998 742		

See also page 95

Notice:

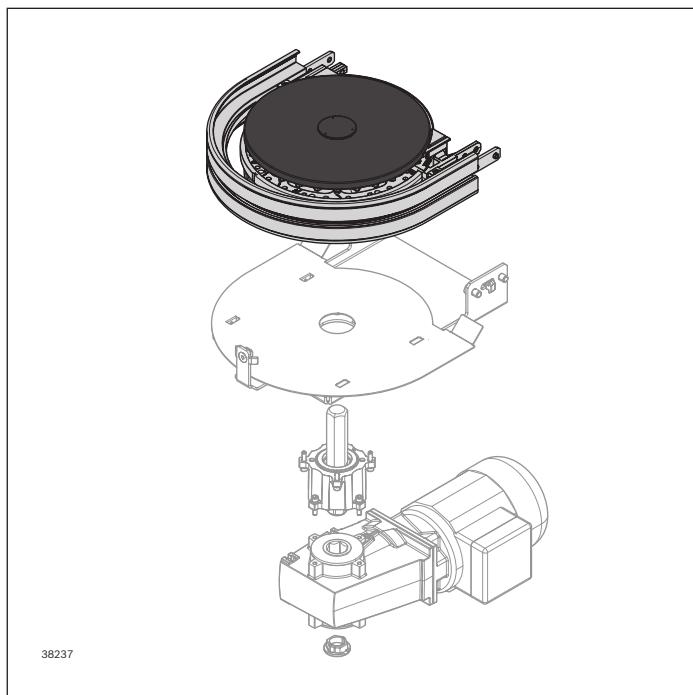
- The drive kit is to be supported with the holder motor leg set STS (3 842 549 365) and an ESD motor leg set
- The selection of the parameter SP = STS is imperative. Even if an aluminum track is used because centering is not possible on an AL flange.

Required accessories:

- Motor leg set ESD, see p. 212

Basic unit

Curve wheel drive AL ESD



The curve wheel drive AL ESD is used for driving the conveyor chain in circuit systems with a top-running chain. Combining the base unit curve wheel 180° AL ESD with the appropriate drive kit quickly turns it into a curve wheel drive.

- Size: 65 and 90
- Suitable chain types: all
- Permissible chain tensile force: $F_{\max} = 400$ N per level
Section length for closed circuits: $L \leq 10$ m
- Permissible torque: $M_{\max} = 60$ Nm
When combining several curve wheel base units, the motor torque must be distributed across the individual levels
- Conveying speed: $v_N = 4 \dots 21$ m/min.
On drives with a frequency converter (FU), the speed must be limited to a maximum of 21 m/min using control technology
- Recommendation: no accumulation operation until 1000 mm after the curve wheel drive
- Can only be used with a closed profile

- ▶ Driving several superimposed basic curve wheel units is easily implemented via the integrated hexagonal hollow shafts
- ▶ Ball bearing made of non-rusting steel (1.4301), with seal on both sides and FDA-compliant grease filling
- ▶ Side elements with slot to attach holders for lateral guides, or similar

Required accessories:

- Curve wheel drive kit, see p. 95
- Assembly module, see p. 62
- Sliding rail: Length calculation, see p. 314
- Leg set, see p. 123

Optional accessories:

- Alpine conveyor connection kit, see p. 116

Scope of delivery:

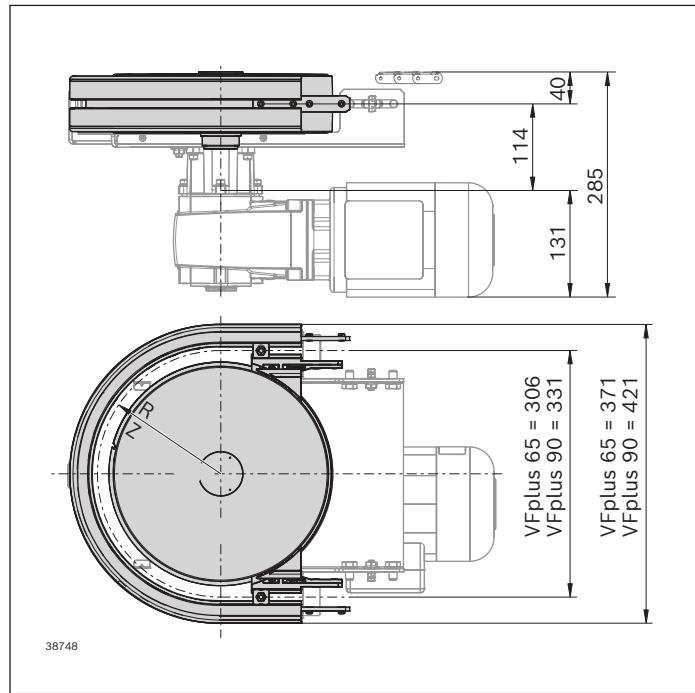
- Incl. fastening material

Condition on delivery:

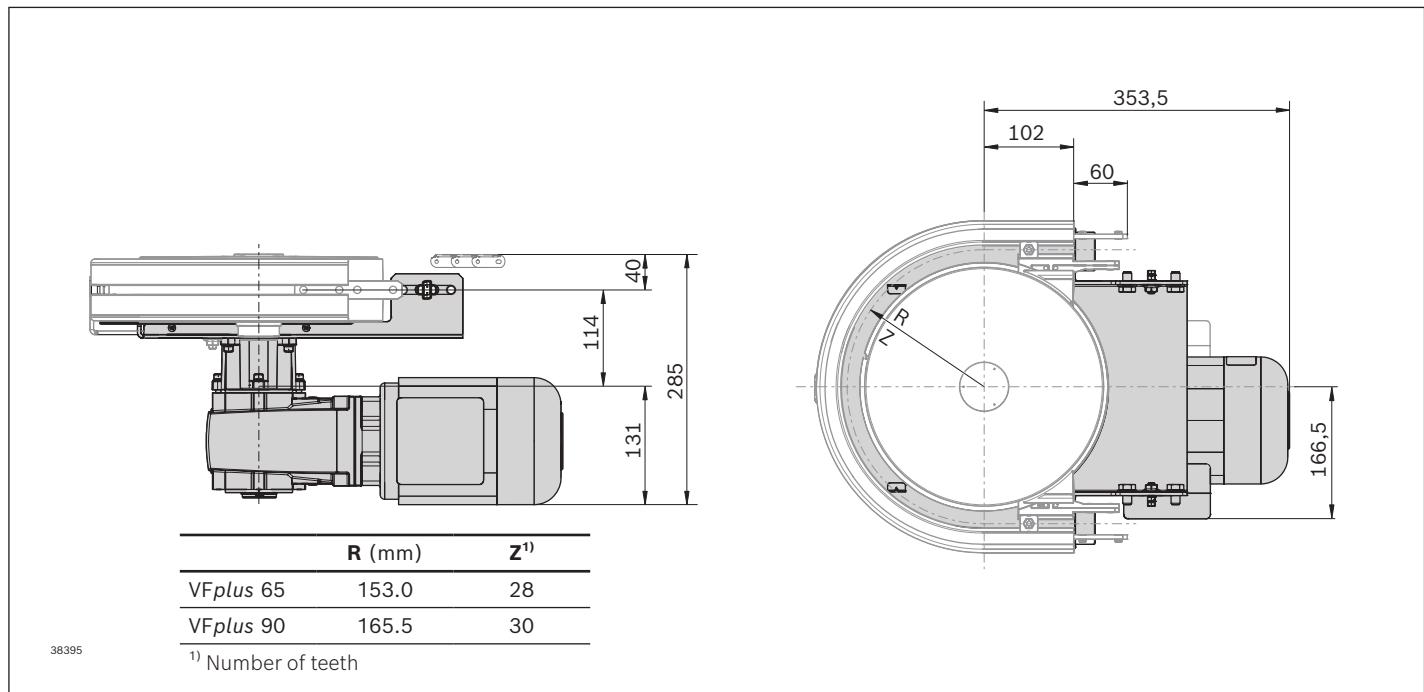
- Assembly required

Material:

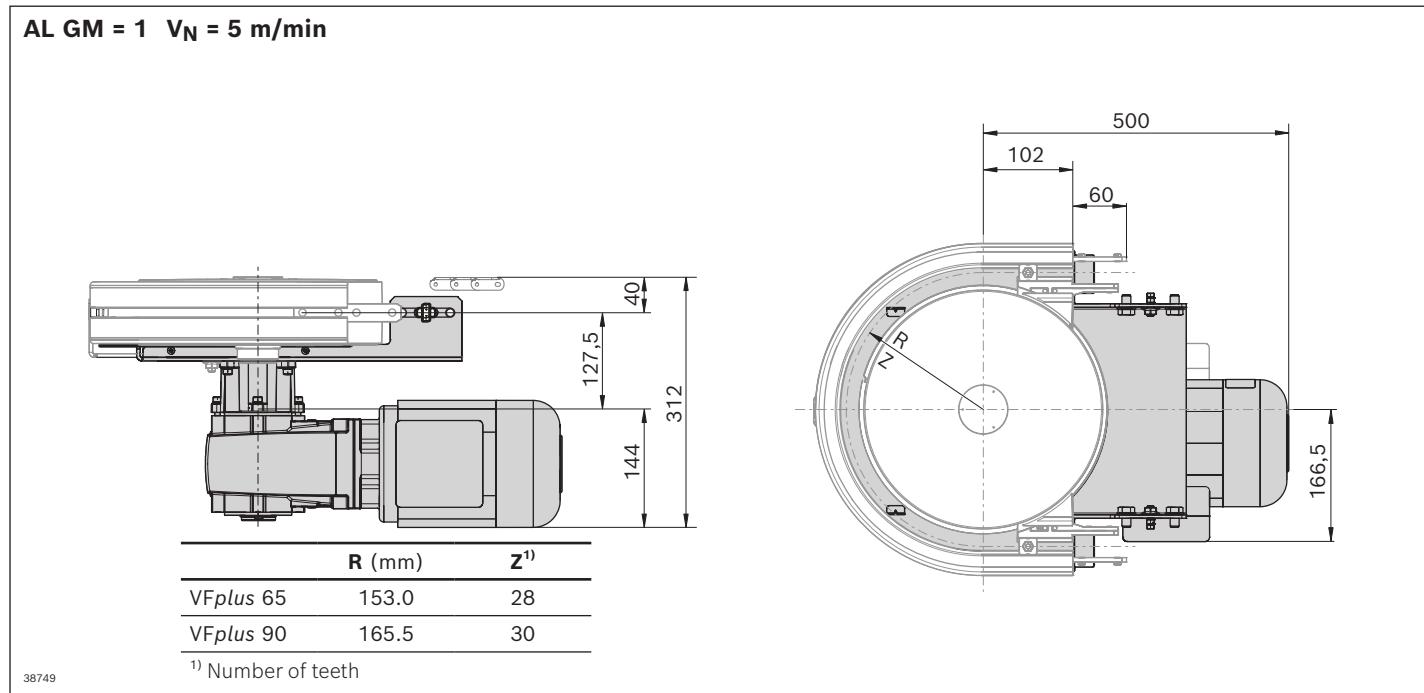
- Housing: Diecast aluminum
- Chain wheel: PA; black
- Ball bearing: Non-rusting steel 1.4301/FDA



Basic unit curve wheel AL ESD	α (°)	No.
VFplus 65	180	3 842 553 037
VFplus 90	180	3 842 553 038



AL GM = 1 V_N = 5 m/min



Drive kit curve wheel VFplus AL

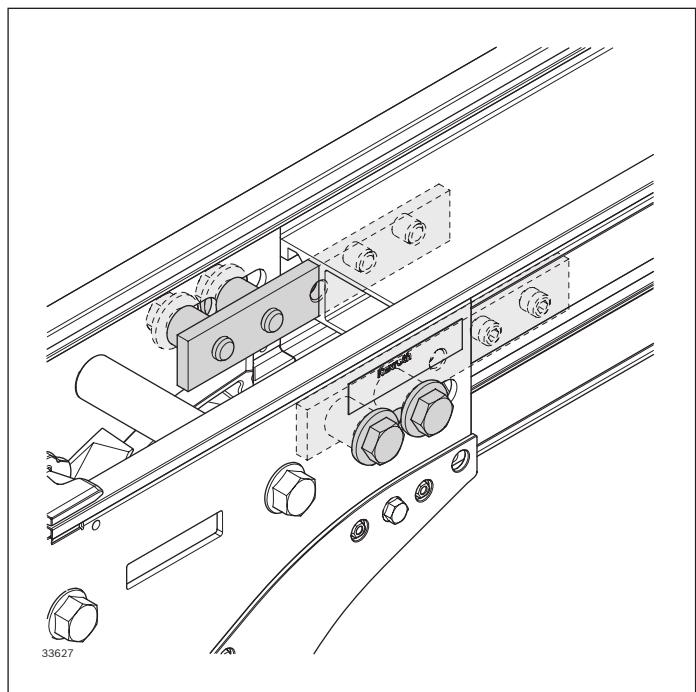
No.

3 842 998 742

See also page 95

Notice: The selection of parameter AC = 1 (alpine conveyor) is not permitted

Adapter AL-STS



Scope of delivery:

- 8x hexagon screws
- 8x headless setscrew
- 8x spacers

(Scope of delivery for 2 AL-STS interfaces, e.g. 1 x basic unit head drive + 1 x return unit OR 1 x connection, or center drive)

Material:

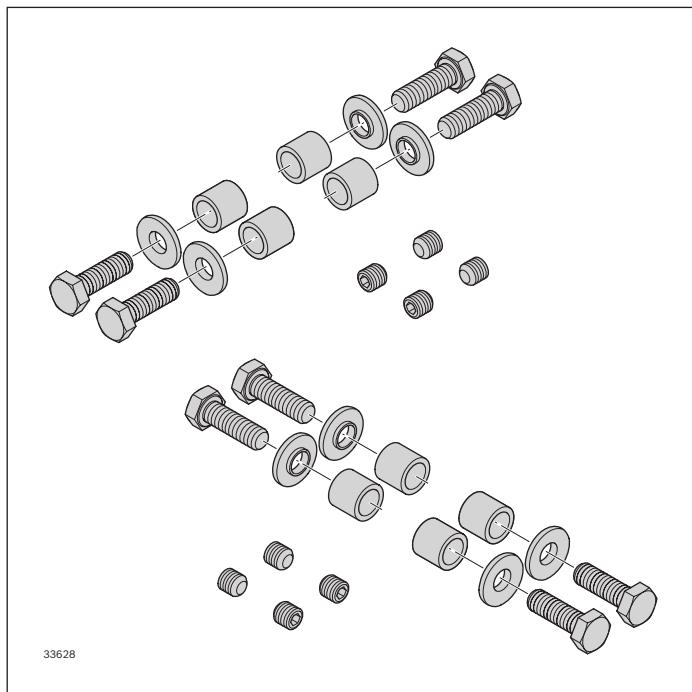
- Aluminum, steel; galvanized

The kit enables the simple connection of the STS basic unit head, connection drive, as well as the return unit with the aluminum system.

When the connection drive is used, the closed AL section profile is to be used for safety reasons.

Condition on delivery:

- Assembly required



33628

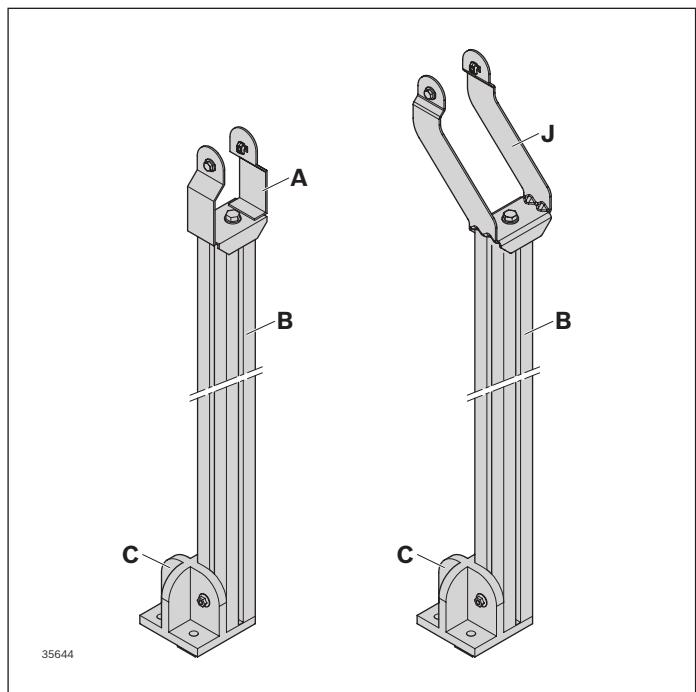
Adapter VFplus AL-STS

No.

3 842 552 948

Leg set ESD

Motor leg set ESD



The STS T-nuts included in the scope of delivery of the STS holder (**A**) must be replaced with MGE T-nuts M8. The anodized layer is thereby pierced and connected to the conductive STS holder.

It is imperative that a holder (**J**) is used to support the motors/drives.

The connection between the STS holders (**A+J**) and the core pull of the AL strut profile (**B**) is established via the M12 hexagon screw of the STS holder.

Instead of the coated VarioFlow foot, the 120x120 base plate (**C**) included in the MGE program must be used. The connection of the base plate to the strut profile is done using T-bolts and flange nuts.

Required accessories for base plate (**C**):

- 4x T-bolts M8x30, 3 842 528 721, see p. 64
- 4x flange nuts, 3 842 345 081, see p. 64

Required accessories for holder attachment (**A**):

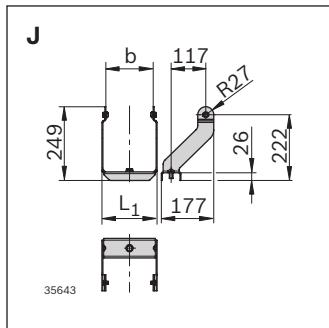
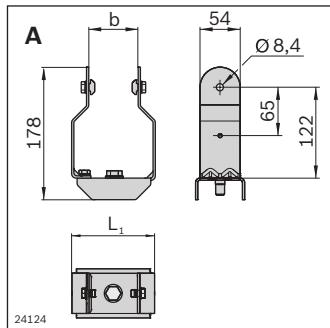
- 2x M8 T-nuts for each holder, 3 842 530 287

Scope of delivery:

- Incl. fastening material

Material:

- **A, J:** Non-rusting steel 1.4301
- **B:** Aluminum
- **C:** Diecast aluminum



Holder STS (A)	b (mm)	L ₁ (mm)	ESD	No.
VFplus 65 support STS	65	111	Set	3 842 546 658
VFplus 90 support STS	90	136	Set	3 842 546 659

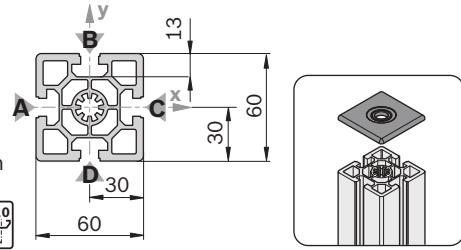
Holder STS (J)	b (mm)	L ₁ (mm)	ESD	No.
VFplus 65 drive STS	65	91	Set	3 842 559 114
VFplus 90 drive STS	90	116	Set	3 842 559 115

5

B**60x60**

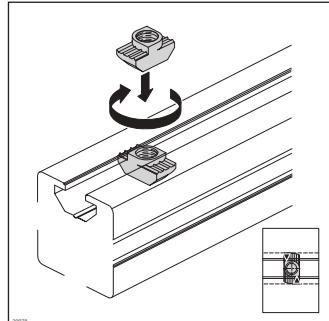
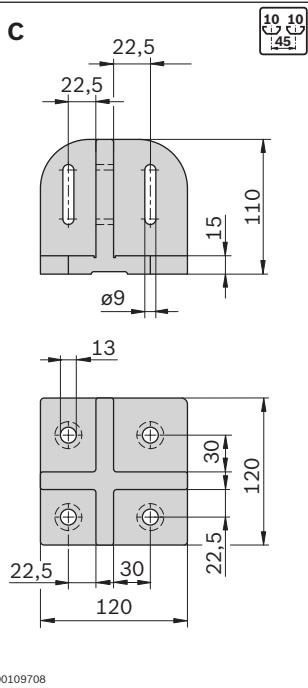
$A = 14,4 \text{ cm}^2$
 $I_x = 52,2 \text{ cm}^4$
 $I_y = 52,2 \text{ cm}^4$
 $W_x = 17,4 \text{ cm}^3$
 $W_y = 17,4 \text{ cm}^3$
 $m = 3,9 \text{ kg/m}$

33821



Strut profile 60x60	L (mm)	No.
1 pc M12	60 ... 5600	3 842 990 351/L

Profile finishing: Thread cutting M12, see MGE catalog, chapter Strut profiles

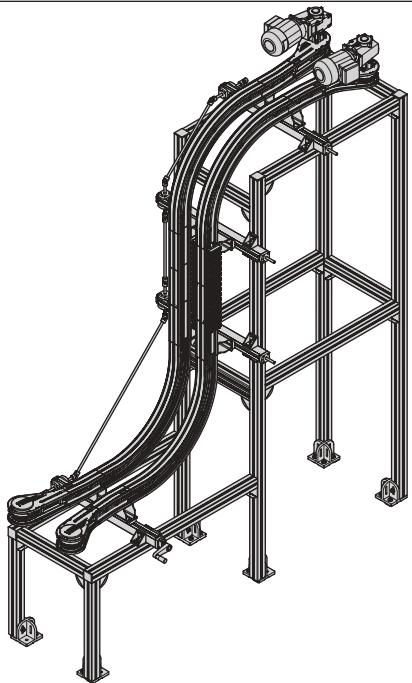
C

Cover cap with hole	ESD	No.
60x60, black	20	3 842 548 811

Base plate (C)	ESD	No.
120x120	20	3 842 527 553

T-nut, 10 mm slot	Slot	M	ESD	No.
Steel; zinc-plated	10	M8	20	100 3 842 530 287

Wedge conveyor



A wedge conveyor is always used if the conveyed product

- cannot be transported vertically on a standard conveyor due to its design
- cannot manage steep inclinations ($> 30^\circ$) due to the position of its center of gravity
- could be damaged by lateral or upper guides due to its sensitive surfaces
- must not slide on 90° gradient or decline section (as it would occur with a cleated chain system)
- should be conveyed without synchronization

A wedge conveyor has two conveyors arranged in parallel to each other which can be quickly set at variable widths by means of the adjustment unit (AL).



Assembly of a wedge conveyor

216



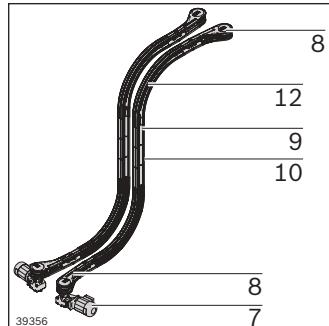
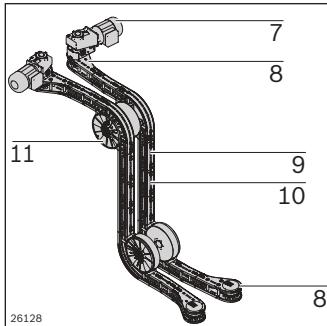
Wedge conveyor adjustment unit

218

Assembly of a wedge conveyor

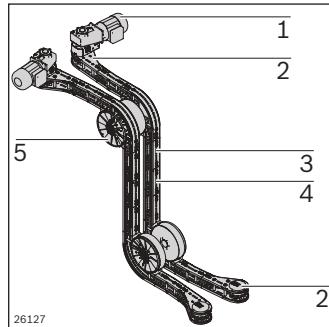
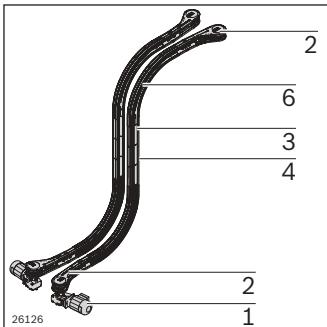


- ▶ Size: 90
- ▶ The length of the wedge conveyor is limited to 7 m
- ▶ A curve wheel or sliding curves are available for the return unit of the chain, depending on the product size and version
- ▶ Only closed head drive (return unit) can be used
- ▶ The assembly module (see p. 62/143) is mandatory
- ▶ The use of a 5° vertical curve is also recommended (see p. 143/152) for the infeed and outfeed, especially for small products
- ▶ Requires the use of the Advanced or Premium sliding rails (see p. 56/138)



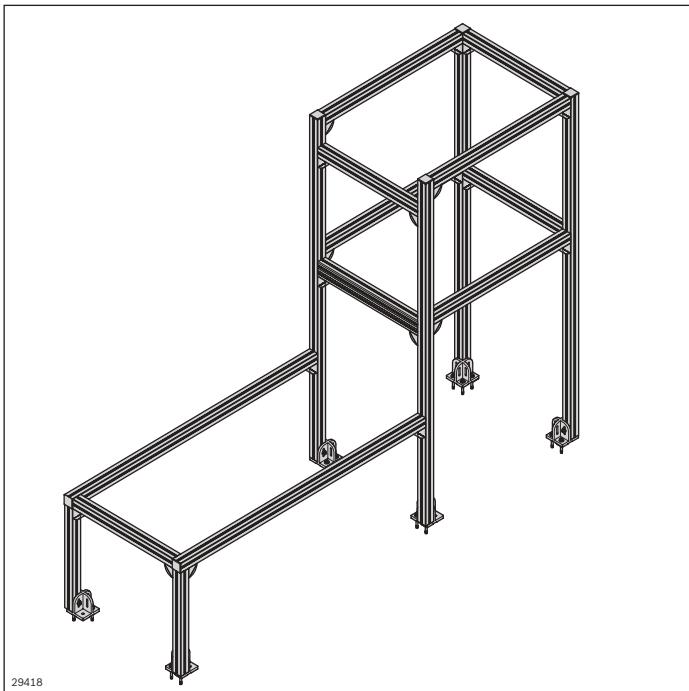
7 STS drive kit, see p. 168
8 STS return unit/STS closed head drive, see p. 164
9 STS section profile, see p. 134
10 STS assembly module, see p. 143
11 STS curve wheel, see p. 146
12 Sliding curve horizontal STS, see p. 148

6

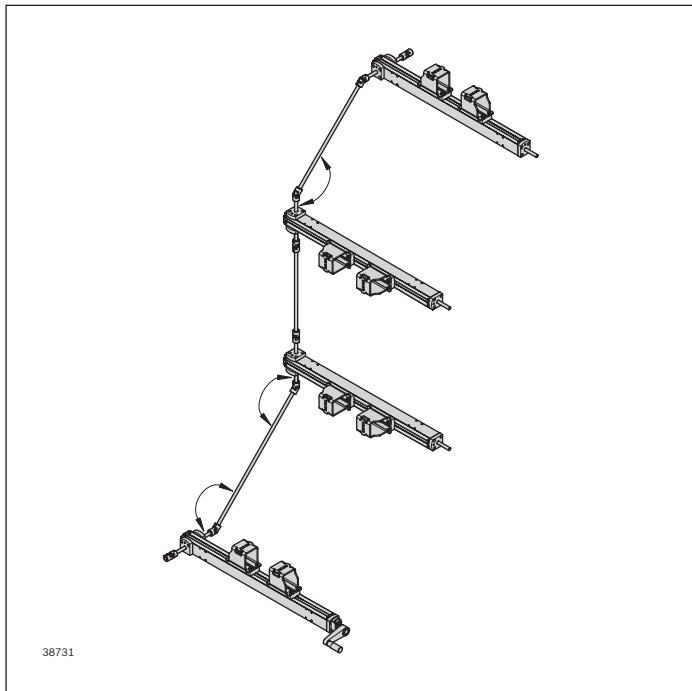


1 AL drive kit, see p. 92
2 AL return unit/AL closed head drive, see p. 86
3 AL section profile, see p. 52/54
4 AL assembly module, see p. 62
5 AL curve wheel, see p. 68
6 Sliding curve horizontal AL, see p. 72

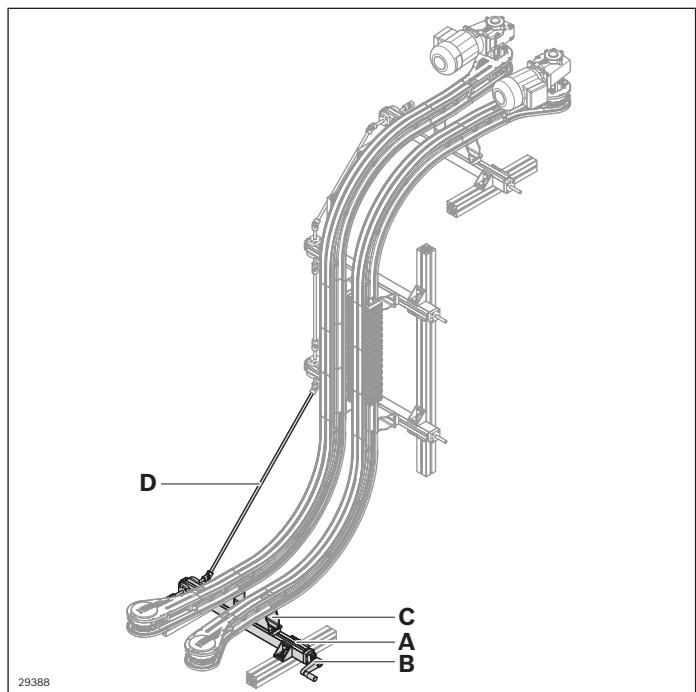
Frame made out of MGE components



Adjustment unit for width adjustment see p. 218



Wedge conveyor adjustment unit



The adjustment unit is suitable for easily setting the wedge conveyor width during a format change for product widths ranging from 0 ... 410 mm.

The self-locking adjustment unit (**A**) can be simply mounted on the VarioFlow *plus* section profile using the connection kit (**C**) and connected to additional adjustment units via the profile rail (**D**).

The crank handle (**B**) with counter facilitates the setting of fixed track widths.

Required accessories:

- **B:** Crank handle incl. counter
- **C:** Connection kit (Set)
- **D:** Profile rail (see p. 219)

Scope of delivery:

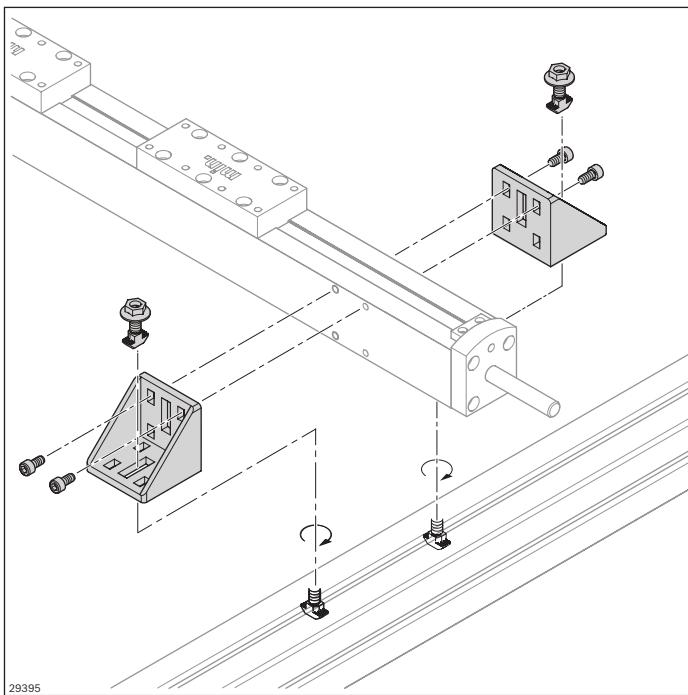
- **A:** Incl. 2 universal joints
- **B:** Incl. counter
- **C:** Incl. fastening material

Material:

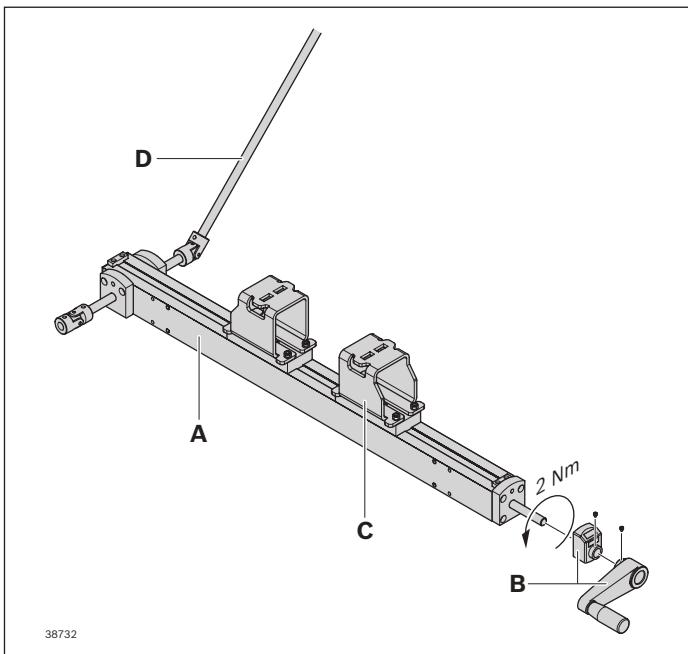
- **A:** Aluminum, anodized; brass, steel
- **C:** Steel, galvanized

Condition on delivery:

- **A:** Assembled
- **B:** Some assembly required
- **C:** Assembly required

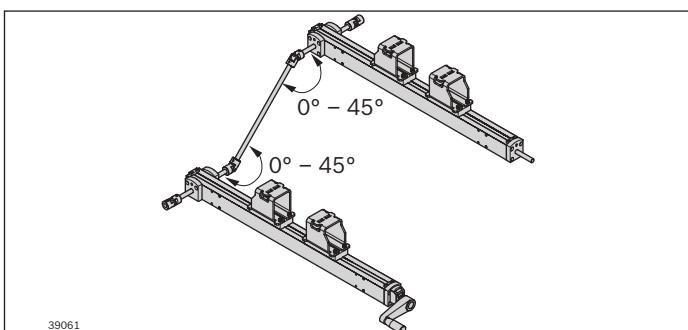


The adjustment unit can be fitted onto a frame made out of MGE profiles with four 60x60 brackets (3 842 523 546) and 8 ISO 4762-M6x16

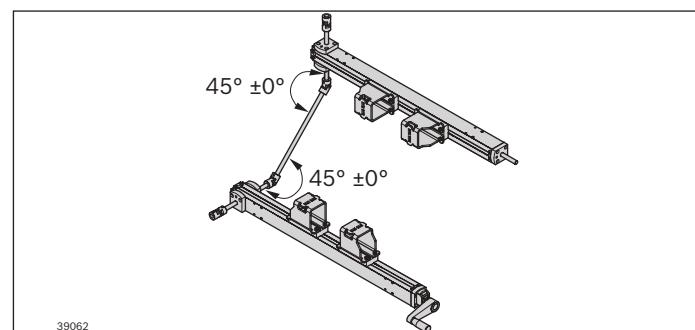


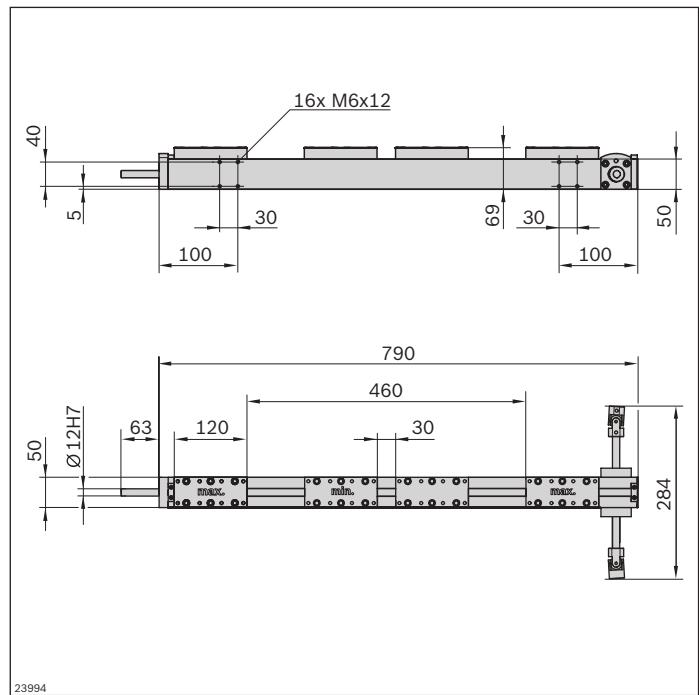
Adjustment unit (A)	No.
1 pc	3 842 547 971
Crank handle (B)	No.
1 pc	3 842 547 990
Connection kit (C)	No.
1 pc	3 842 547 729
Profile rail D12 (D)	No.
1 pc	3 842 993 306/L
6 pcs	3 842 533 841

Linear alignment of the shafts

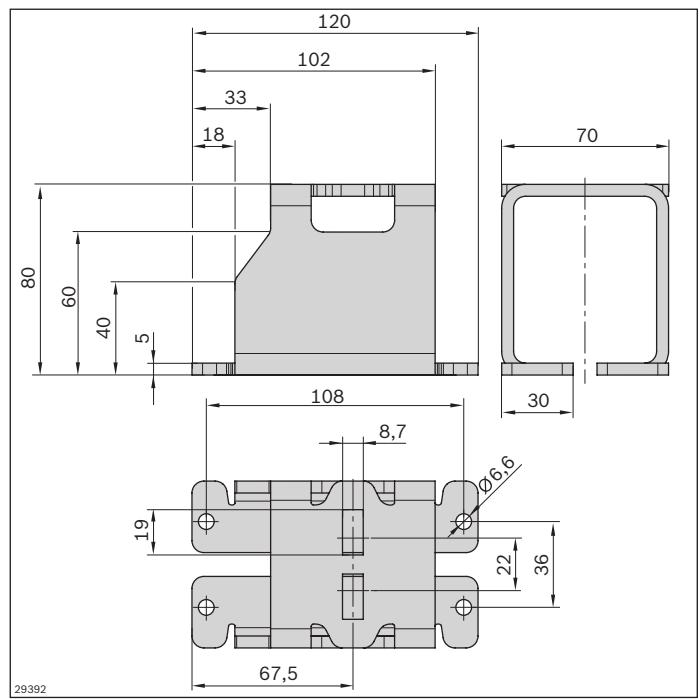


90° offset alignment of the shafts

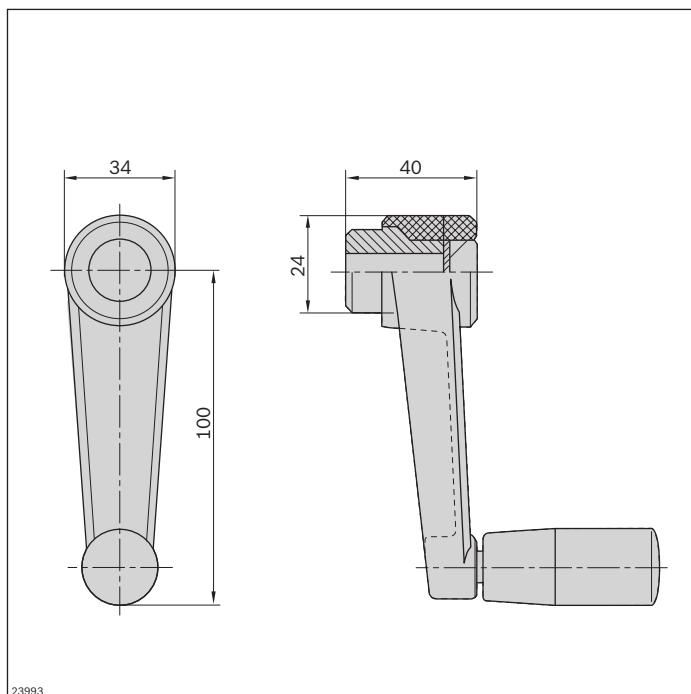




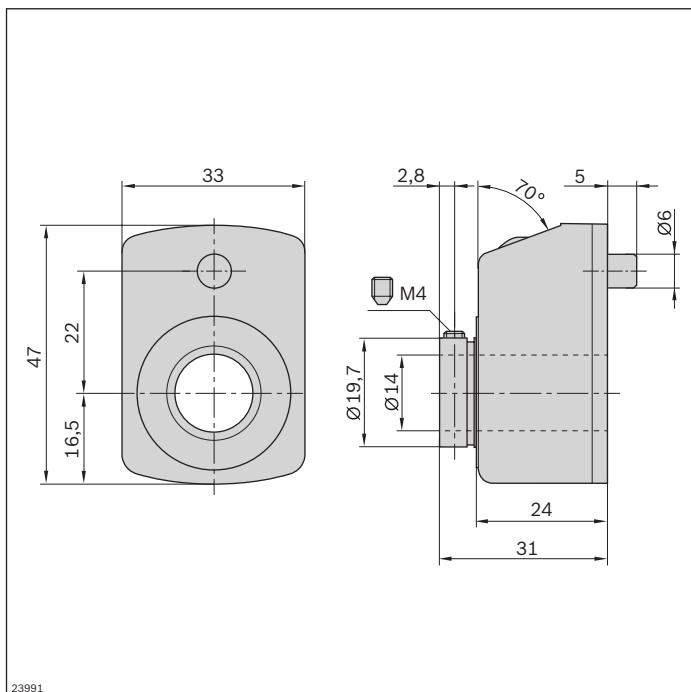
Adjustment unit



Connection kit

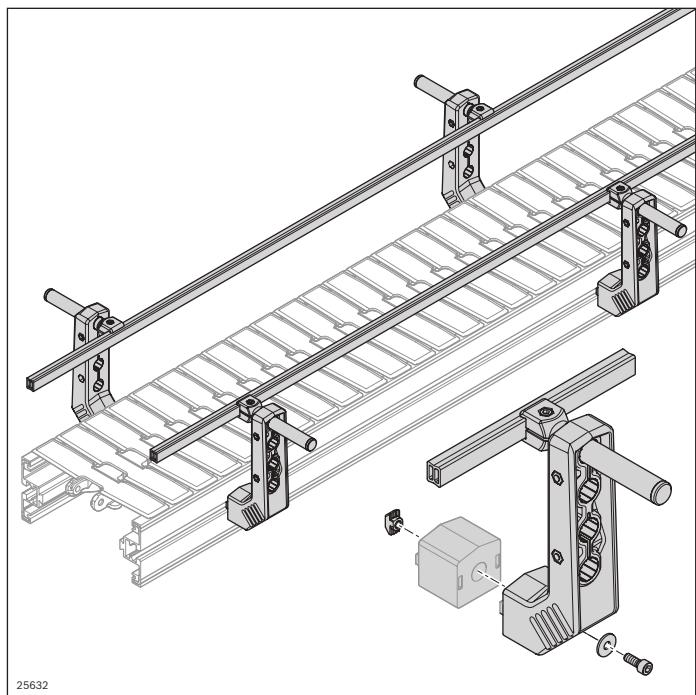
Crank handle

23993



23991

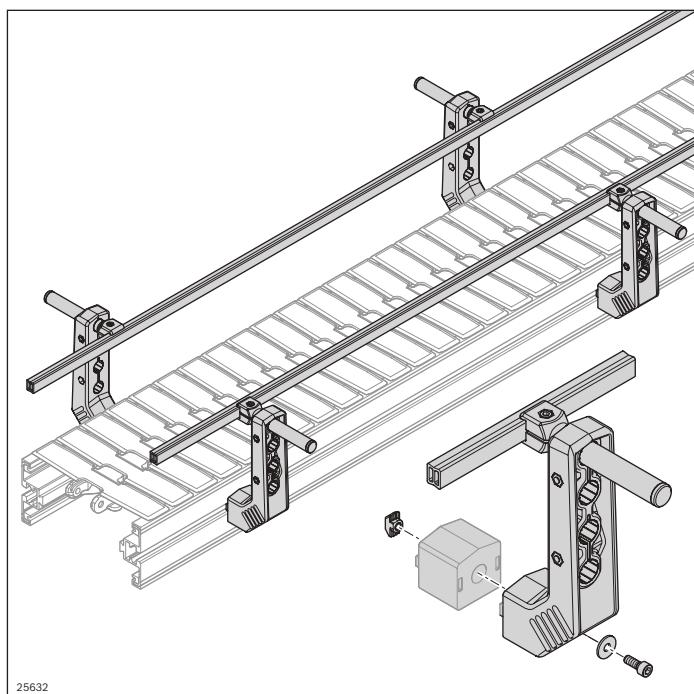
Product guide



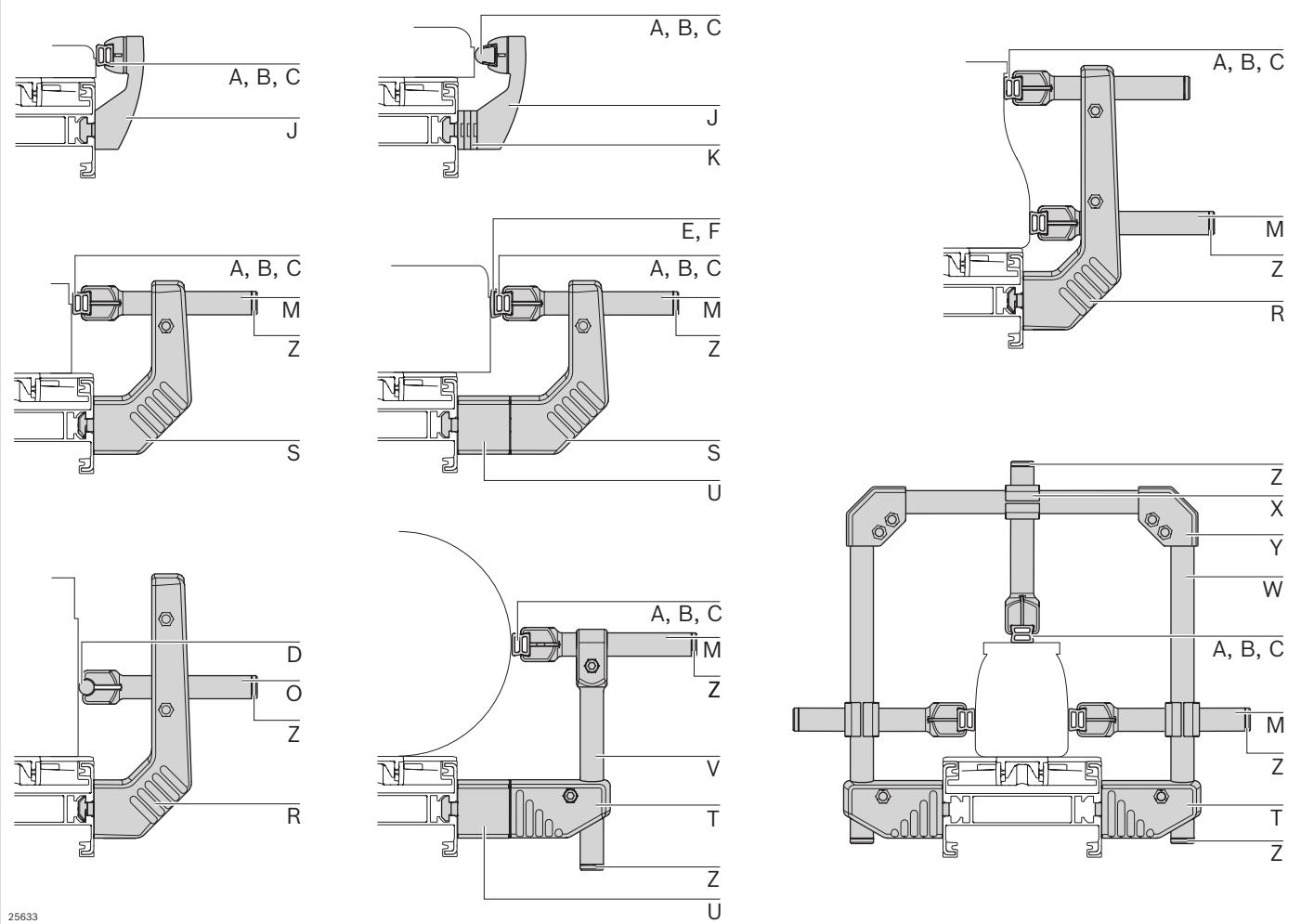
- ▶ Optimum adaptation to the conveyed material due to a variety of combination options
- ▶ Universal use in aluminum and stainless steel system
- ▶ Minimal planning effort thanks to clear construction kit
- ▶ Easy to clean thanks to ample draining surfaces

	Components for lateral guides	224
	Profile rails for lateral guides	226
	Holder for lateral guide, fixed	229
	Holder for lateral guide, variable	231
	Clamping lever	239
	Pressure roller	240
	Barrier	244
	Universal diverter	246

Components for lateral guides



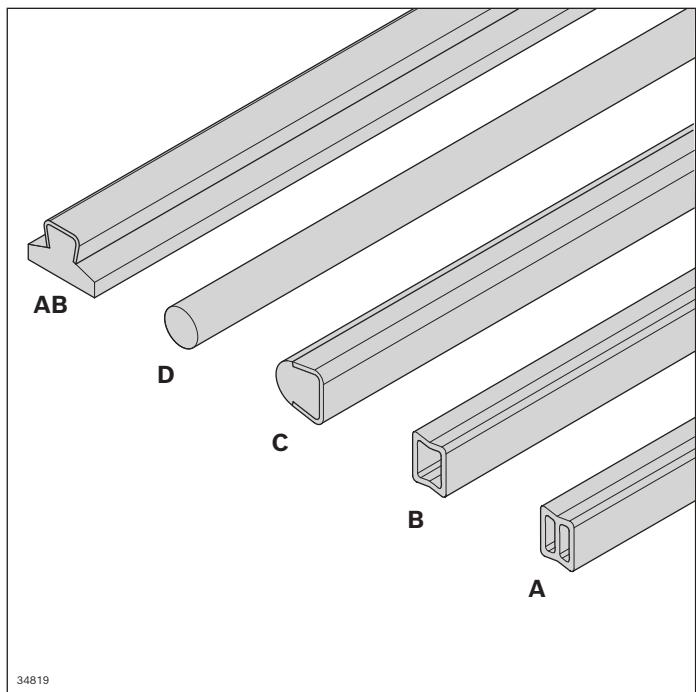
- Wide variety of profile rail and holder combinations for individual solutions
- Easy to clean
- Robust
- Only one tool required for adjustment
- Interface slot 10 mm

Mounting variants

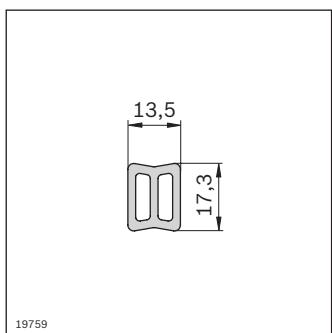
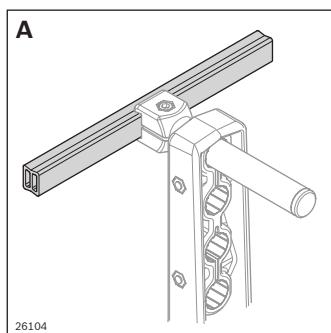
25633

A: Aluminum profile rail, see p. 226**B:** HDPE profile rail, see p. 227**C:** Profile rail 17x17.5, see p. 227**D:** Profile rail D12, see p. 227**E:** Sliding rail, narrow, see p. 228**F:** Sliding rail, high, see p. 228**J:** Holder, fixed, see p. 230**K:** Spacer plate, see p. 230**M:** Clamping holder C L100, see p. 233**O:** Clamping holder D12 L100, see p. 233**R:** Holder L204, see p. 234**S:** Holder L134, see p. 234**T:** Holder L45, see p. 235**U:** Spacer, see p. 235**V:** Vertical clamping holder D18 L160, see p. 235**W:** Tube D18, see p. 236**X:** Cross piece, see p. 236**Y:** Corner piece, see p. 236**Z:** Plug, see p. 236

Profile rails for lateral guides



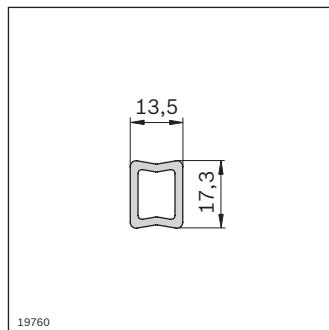
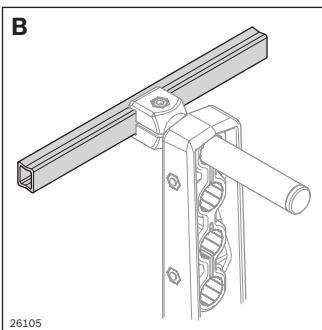
- Profile rails for guiding the transported material
- Compatible with holders for lateral guide, fixed (see p. 229), and holders for lateral guide, flexible (see p. 231)
- Various materials and geometries for different applications



- Aluminum profile rail for robust lateral guides
- Holder distance: max. 750 mm, less with accumulation pressure

Aluminum profile rail		L (mm)	No.
A	1 pc	200 ... 3000	3 842 993 887/L
A	20 pcs	3000	3 842 538 829

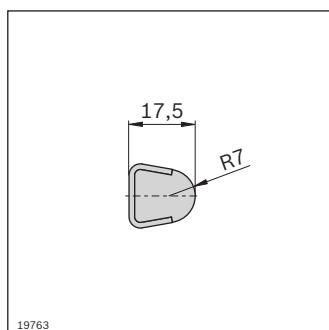
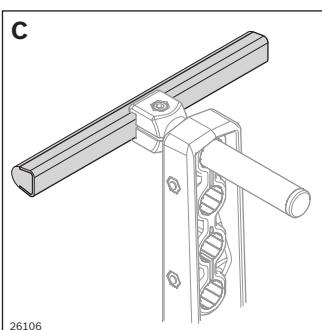
Material: Aluminum; natural, anodized
 Accessories: Sliding rail narrow (E); sliding rail high (F); outer profile connector (G); inner profile connector (H); cover cap (I); clamping holder C L100 (M); clamping holder C (N); holder (J); clamping head (L); clamping head (Q)



- HDPE profile rail for light applications
- Bendable
- Spacer distance: approx. 300 mm

		L (mm)	No.
B	1 pc	3000	3 842 538 388

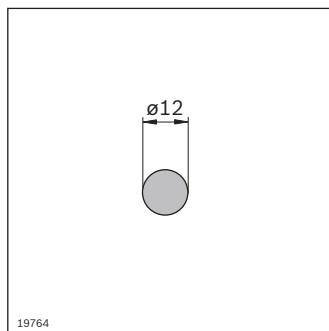
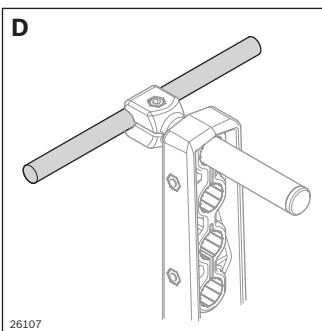
Material: HDPE; gray
 Accessories: Sliding rail narrow (**E**); sliding rail high (**F**); outer profile connector (**G**); inner profile connector (**H**); cover cap (**I**); clamping holder C L100 (**M**); clamping holder C (**N**); holder (**J**); clamping head (**L**); clamping head (**Q**)



- Profile rail 17x17.5 in robust design made of stainless steel 1.4301 with PE guide protecting the product
- Holder distance: max. 750 mm, less with accumulation pressure

		L (mm)	No.
C	1 pc	200 ... 3000	3 842 994 863/L
C	20 pcs	3000	3 842 529 850

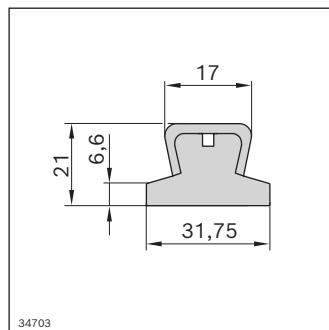
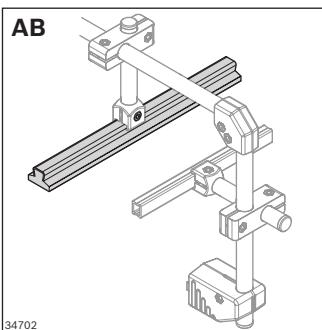
Material: Steel; stainless/PE; natural
 Accessories: Outer profile connector (**G**); clamping holder C L100 (**M**); clamping holder C (**N**); holder (**J**); clamping head (**L**); clamping head (**Q**)



- Profile rail D12 in robust design made of stainless steel 1.4301
- Holder distance: max. 750 mm, less with accumulation pressure

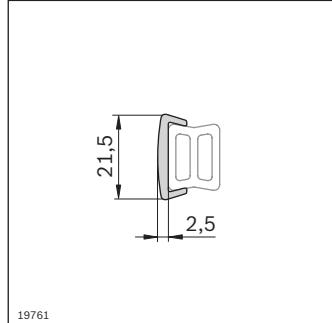
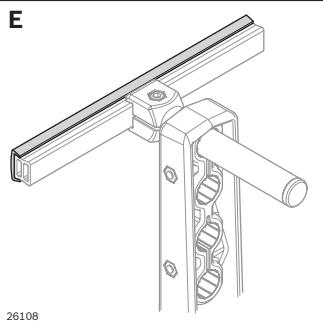
		L (mm)	No.
D	1 pc	200 ... 3000	3 842 993 306/L
D	6 pcs	3000	3 842 533 841

Material: Steel; stainless
 Accessories: Clamping holder D12 L100 (**O**); clamping holder D12 (**P**)



- T-profile rail for simple section separation or lateral guiding of transported material
- In robust version made of non-rusting steel with PE guide for gentle product handling
- Holder distance: approx. 750 mm, less with accumulation pressure

		L (mm)	No.
AB		3000	3 842 571 233



- Clip-on sliding rail for aluminum or HDPE profile rail
- For gentle product transport and minimum wear to profile rail HDPE

Sliding rail, narrow	L (mm)	ESD	No.
E	3000		3 842 538 209
E	3000	▲	3 842 539 340

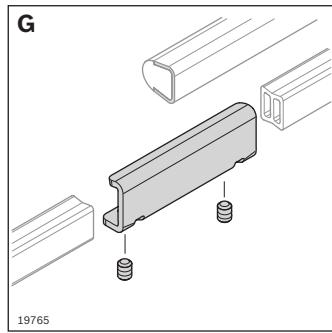
Material: HDPE; gray
ESD: PE-UHMW, conductive, black

- Clip-on sliding rail for aluminum or HDPE profile rail
- Wide guiding surface
- For gentle product transport and minimum wear to profile rail HDPE

Sliding rail, high	L (mm)	No.
F	3000	3 842 538 389

Material: HDPE; gray

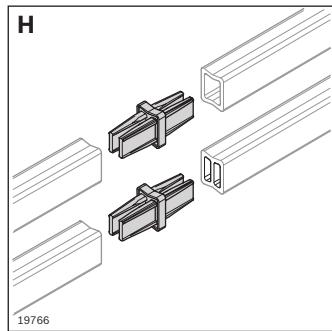
- Outer profile connector for aluminum profile rails (A), HDPE profile rail (B), 17x17.5 profile rail (C)



Outer profile connector	No.
G	10 3 842 539 613

Material: Steel; stainless

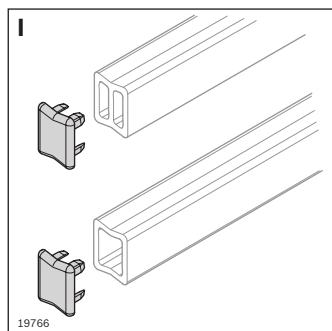
Scope of delivery: Incl. 2 x headless setscrew



- Inner profile connector for profile rail in aluminum (A), profile rail HDPE (B)

Internal profile connector	No.
H	10 3 842 539 345

Material: PA; black, conductive

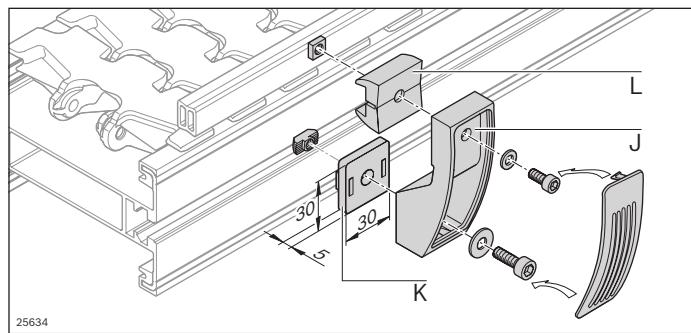


- Cover cap for aluminum (A) profile rail, HDPE (B) profile rail

Cover cap	No.
I	10 3 842 538 208

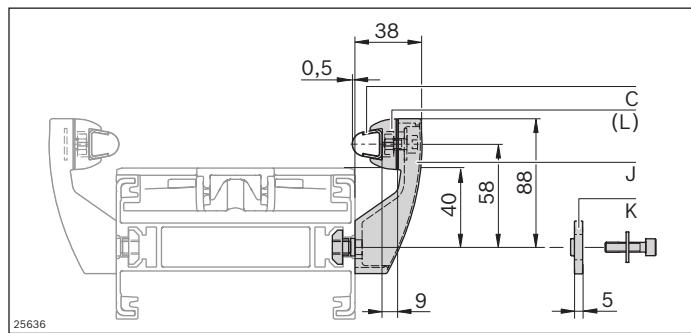
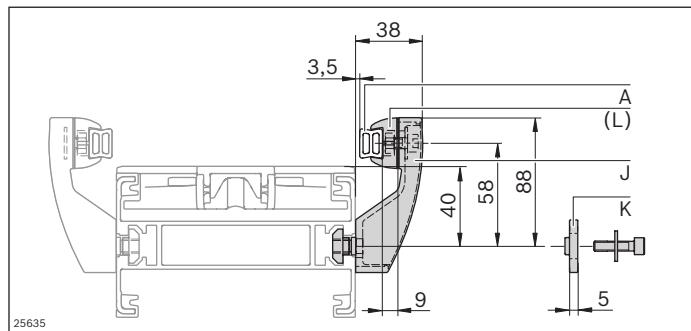
Material: PA; black, conductive

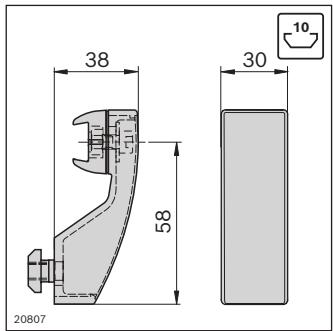
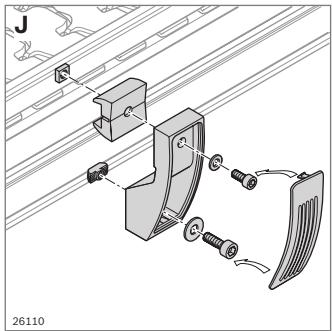
Holder for lateral guide, fixed



- Holders for lateral guides with fixed installation height and fixed guide width

7





- Holder, fixed, for profile rail in aluminum (**A**), HDPE (**B**) and 17x17.5 (**C**)
- For fixed guide width
- Spacer plate (**K**) for guide width enlargement

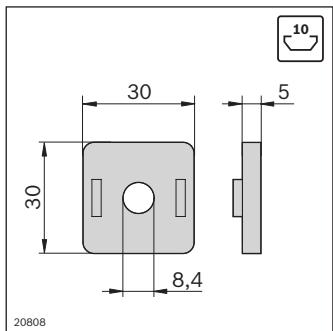
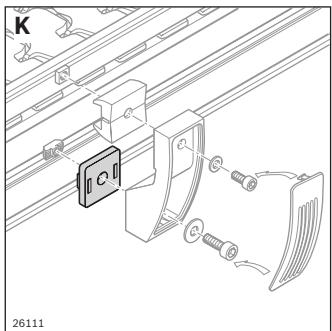
Holder, fixed	No.
---------------	-----

J Set	3 842 527 851
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Material: PA; black

Fastening material: Steel; zinc-plated

Scope of delivery: Incl. clamping head, fastening material

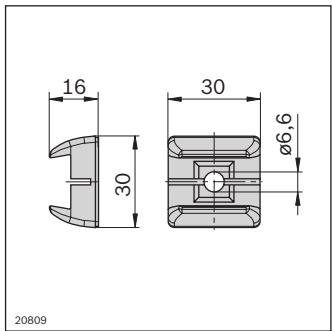
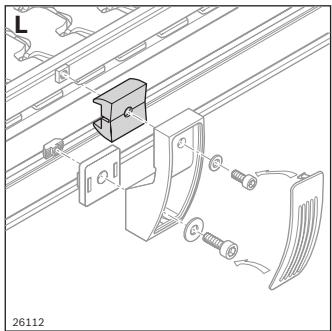


- Spacer plate for holders, fixed, to enlarge the guide width

Spacer plate	No.
--------------	-----

K	10 3 842 527 738
---	------------------

Material: PA; black



- Clamping head for on-site construction of supports for protruding transported material

Clamping head	No.
---------------	-----

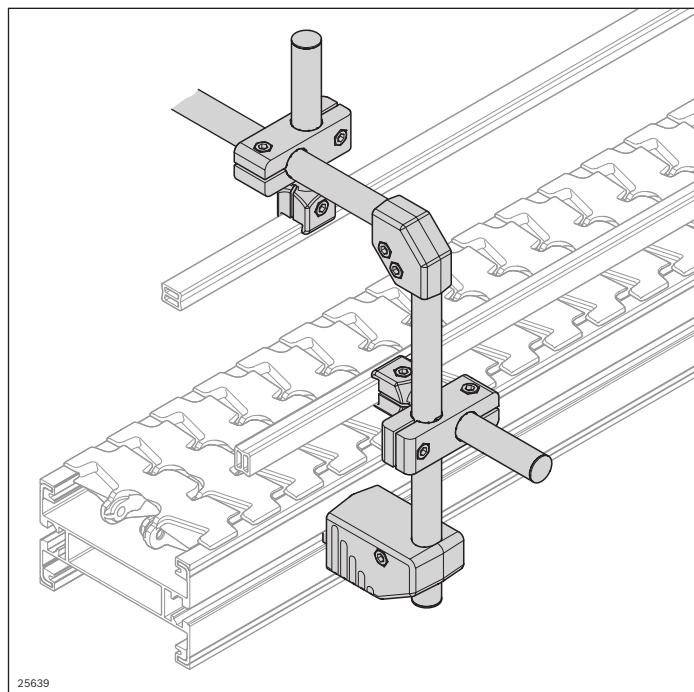
L Set	10 3 842 536 295
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Material: PA; black

Fastening material: Steel; zinc-plated

Scope of delivery: Incl. fastening material

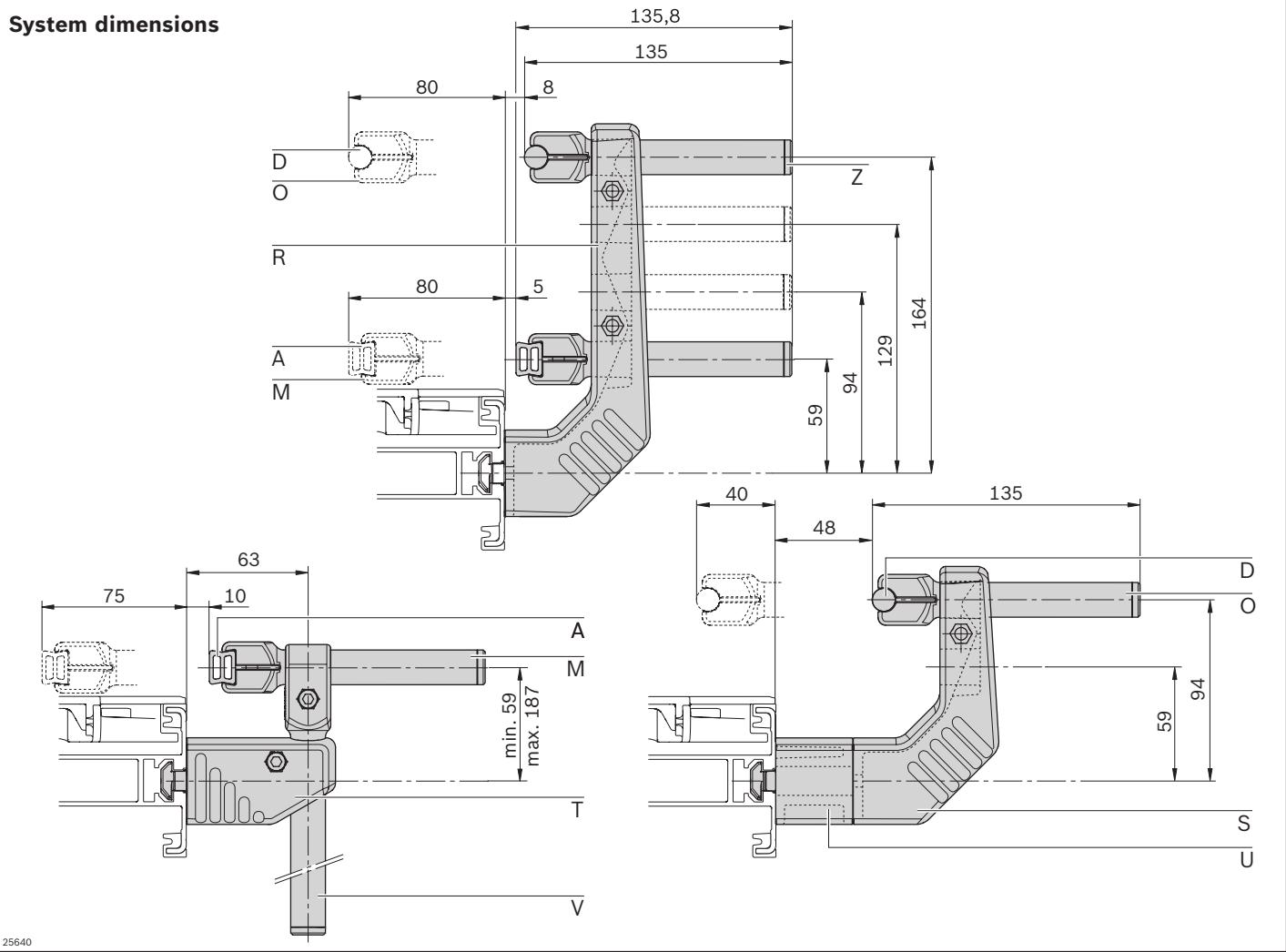
Holder for lateral guide, variable

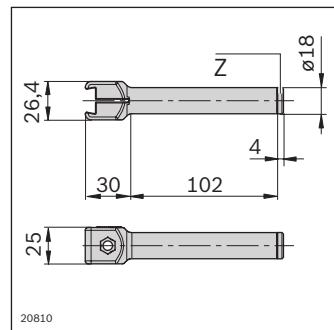
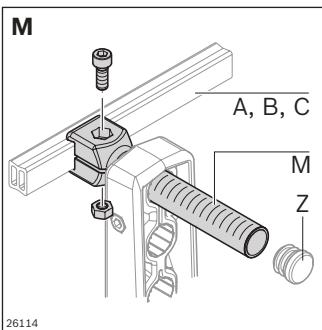


7

- Holder and clamping holder allow for the variable adjustment of the guide height and width
- Easy to clean

Notice: For lateral guide stability, at least two holders must be connected with a continuous profile rail.

System dimensions**A:** Aluminum profile rail, see p. 226**D:** Profile rail D12, see p. 227**M:** Clamping holder C L100, see p. 233**O:** Clamping holder D12 L100, see p. 233**R:** Holder L204, see p. 234**S:** Holder L134, see p. 234**T:** Holder L45, see p. 235**U:** Spacer, see p. 235**V:** Vertical clamping holder D18 L160, see p. 235**Z:** Plug, see p. 236

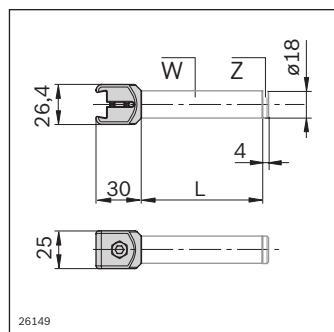
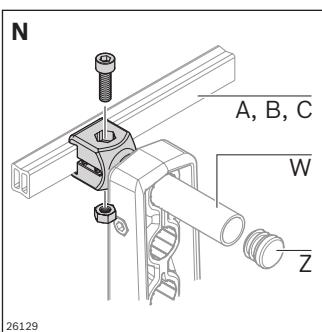


- Clamping holder C L100 for supporting aluminum (A), HDPE (B) or 17x17.5 (C) profile rail versions
- Scaling in mm and inch for simple alignment

Clamping holder C L100

No.
M 10 3 842 539 499

Material: Clamping holder: PA; black
Nut, screw: Steel; stainless
Accessories: Plug (Z)

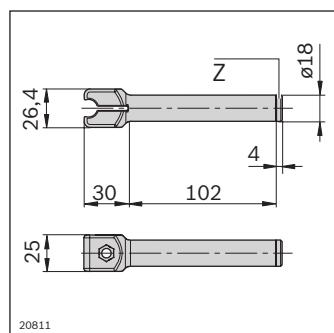
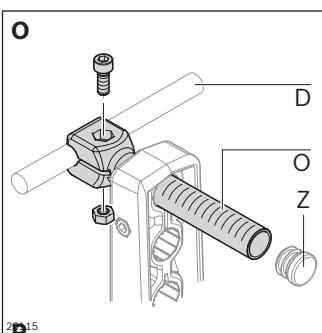


- Clamping holder C for mounting profile rails aluminum (A), HDPE (B) or 17x17.5 (C) profile rail versions
- In conjunction with tube 18 (W) for constructing longer clamping holders

Clamping holder C

No.
N 10 3 842 547 228

Material: Clamping holder: PA; black
Nut, screw: Steel; stainless
Accessories: Plug (Z)
Tube D18 (W)

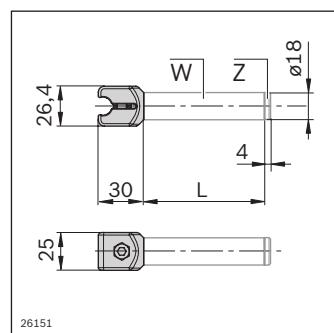
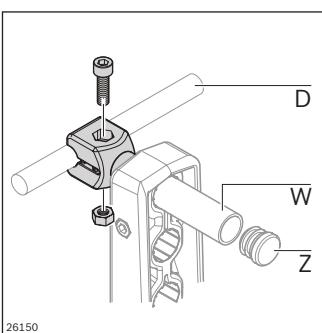


- Clamping holder D12 L100 for supporting profile rails D12 (D)
- Scaling in mm and inch for simple alignment

Clamping holder D12 L100

No.
O 10 3 842 539 498

Material: Clamping holder: PA; black
Nut, screw: Steel; stainless
Accessories: Plug (Z)

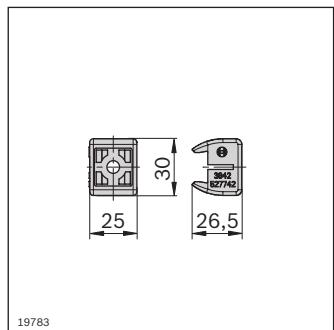
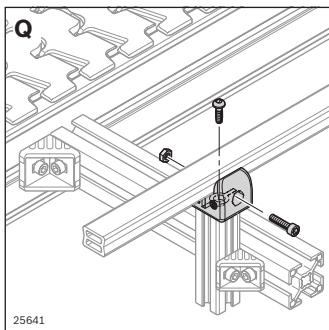


- Clamping holder D12 for supporting profile rails D12 (D)
- In conjunction with tube 18 (W) for constructing longer clamping holders

Clamping holder D12

No.
P 10 3 842 547 227

Material: Clamping holder: PA; black
Nut, screw: Steel; stainless
Accessories: Plug (Z)
Tube D18 (W)

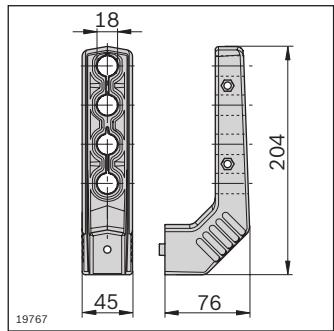
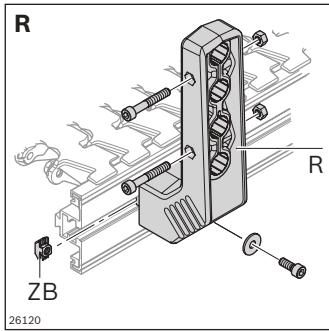


- Clamping head for supporting aluminum (**A**), HDPE (**B**) or stainless steel 1.4301 profile rail versions with PE guide (**C**)
- Direct mounting on profiles with 10 mm slot

Clamping head	No.
Q Set	10 3 842 528 009

Material: Clamping holder: PA; black
Fastening material: Steel; zinc-plated

Scope of delivery: Incl. fastening material



- Holder for fastening clamping holders C, C L100, D12, or D12 L100
- Various installation heights possible for clamping holders
- Variable guide widths possible
- Spacer (**U**) for added enlargement of guide width

Holder L204	No.
R Set	3 842 539 494

ZB T-nut for AL 100 3 842 530 285

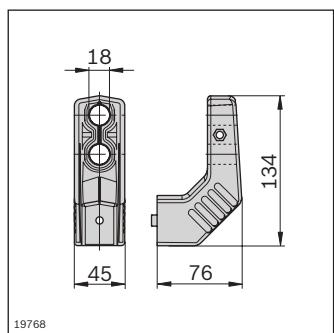
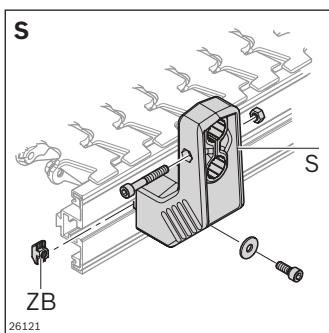
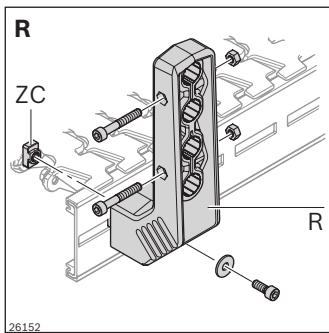
ZC T-nut for STS 20 3 842 546 706

Material: PA, black
Fastening material: Steel; stainless

Scope of delivery: Incl. fastening material (except for T-nuts)

Required accessories: T-nut for AL or STS

Optional accessories: Spacer (**U**)



- Holder for mounting clamping holders C, C L100, D12 or D12 L100
- Various installation heights possible for clamping holders
- Variable guide widths possible
- Spacer (**U**) for added enlargement of guide width

Holder L134	No.
S Set	3 842 539 495

ZB T-nut for AL 100 3 842 530 285

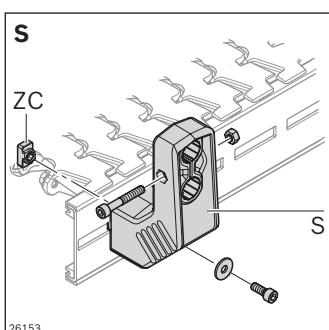
ZC T-nut for STS 20 3 842 546 706

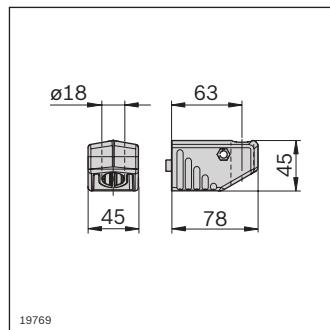
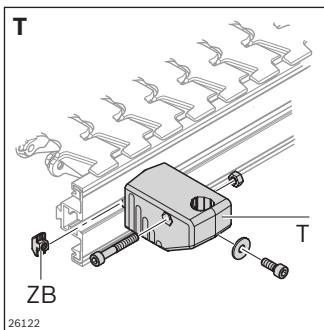
Material: PA; black
Fastening material: Steel; stainless

Scope of delivery: Incl. fastening material (except for T-nuts)

Required accessories: T-nut for AL or STS

Optional accessories: Spacer (**U**)

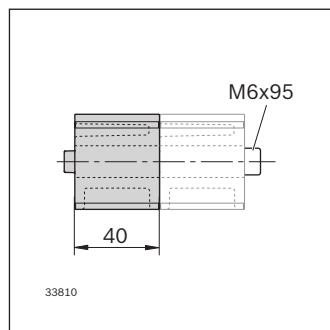
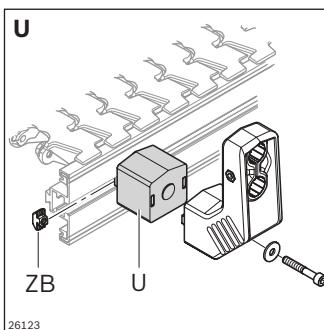
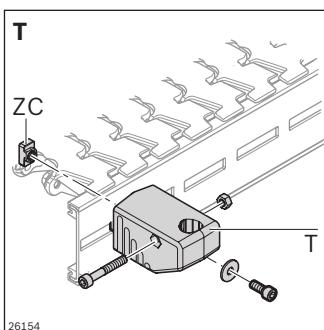




- Holder L45 for fastening vertical clamping holders or tube D18
- For infinitely height-adjustable lateral guides
- Spacer (U) for enlargement of guide width

Holder L45	
	No.
T Set	10 3 842 539 496
ZB T-nut for AL	100 3 842 530 285
ZC T-nut for STS	20 3 842 546 706

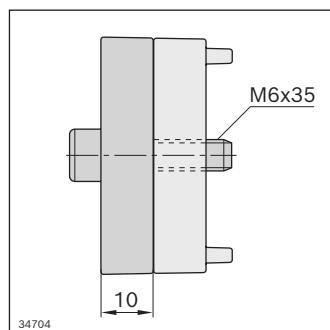
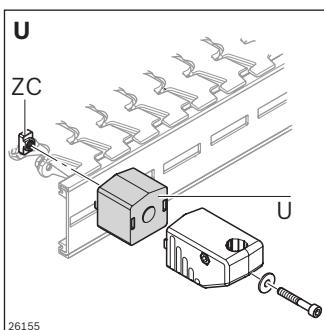
Material: PA; black
 Fastening material: Steel; stainless
 Scope of delivery: Incl. fastening material (except for T-nuts)
 Required accessories: T-nut for AL or STS
 Optional accessories: Spacer (U)



- Spacer for guide width enlargement
- 2 versions can be combined as desired, pluggable
- Centering lug for easy assembly
- Stable connection thanks to stainless steel core

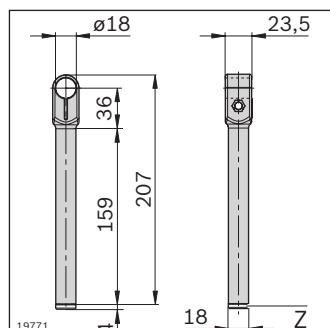
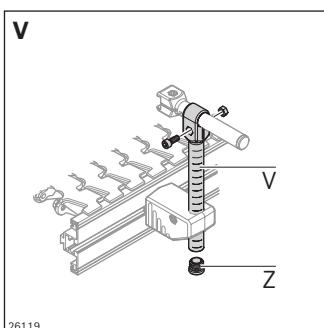
Spacer	
	No.
U Set 40 mm	10 3 842 539 497
U Set 10 mm	10 3 842 567 773
ZB T-nut for AL	100 3 842 530 285
ZC T-nut for STS	20 3 842 546 706

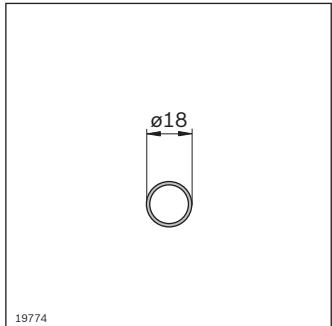
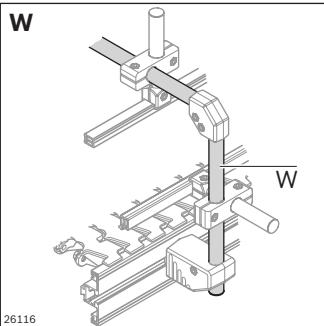
Material: PA; black
 Fastening material: Steel; stainless
 Scope of delivery: Incl. fastening material (except for T-nuts)
 Required accessories: T-nut for AL or STS



- Vertical clamping holder for constructing height-adjustable guides

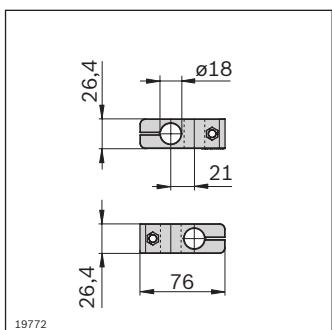
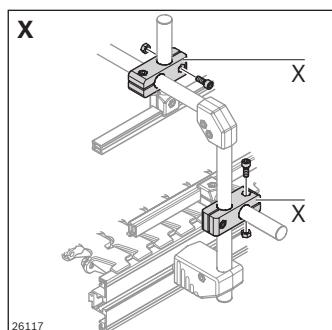
Vertical clamping holder D18 L160	
	No.
V	10 3 842 539 500
Material:	PA; black
	Nut, screw: Steel; stainless
Accessories:	Plug (Z)





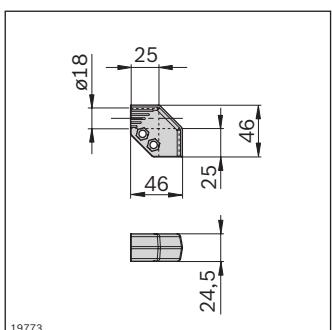
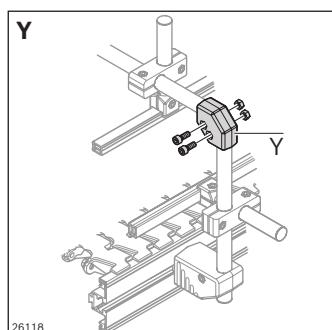
- Tube D18 for constructing height-adjustable vertical holders or cross members for upper guides

Tube D18	L (mm)	No.
W	3000	3 842 539 339
Material:	Non-rusting steel 1.4301	
Accessories:	Plug (Z)	



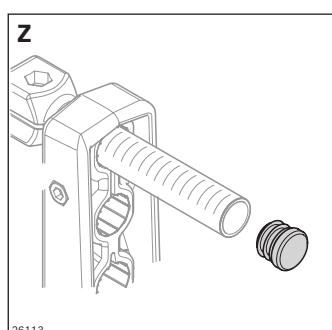
- Cross piece for the intersecting, right-angled connection of tubes D18 (W) and clamping holders C L100 (M) or D12 L100 (O)

Cross piece	No.
X	10 3 842 539 501
Material:	Corner connecto: PA; black Nut, screw: Steel; non-rusting



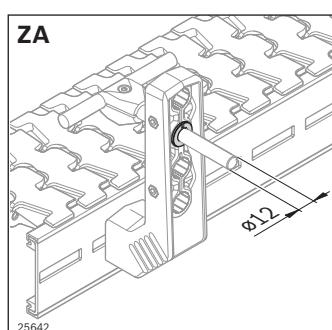
- Corner piece for end-to-end, perpendicular connections of tubes D18 (W) and clamping holders C L100 (M) or D12 L100 (O)

Corner piece	No.
Y	10 3 842 539 505
Material:	Corner piece PA; black Nut, screw: Steel; non-rusting



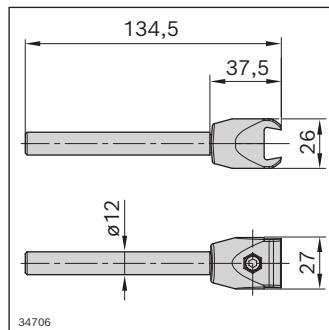
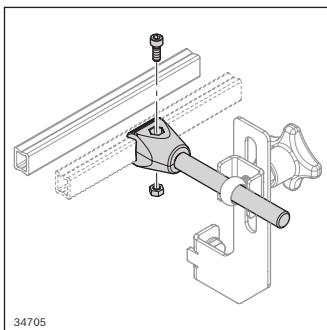
- Plug for clamping head C L100 (M), clamping holder D12 L100 (O), vertical clamping holder D18 L160 (V) or tube D18 (W)

Plug	No.
Z	10 3 842 539 826
Material:	PA; black



- Reducing adapter for mounting round profiles Ø12 in attachments D18, e.g. for customer-specific clamping holder

Reducing adapter	No.
ZA	20 3 842 539 344
Material:	PA; black



- Clamping holder C L80 for accommodating aluminum profile rails (A), HDPE (B), 17x17.5 (C) or T 21x32

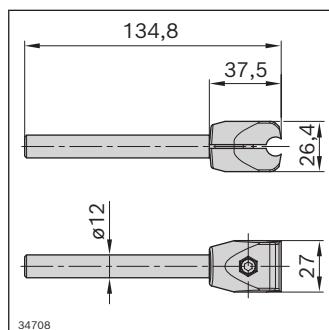
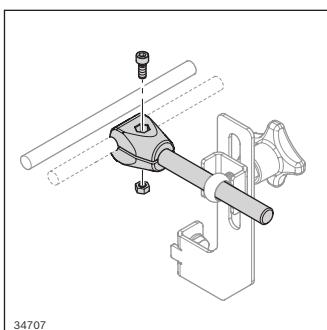
Clamping holder C L80


No.

10 3 842 571 168

Material: Clamping head: PA;
Clamping rod, fastening material:
Steel; non-rusting

Accessories: Stainless steel holder, clamping bracket, star knob



- Clamping holder C for accommodating profile rails D12

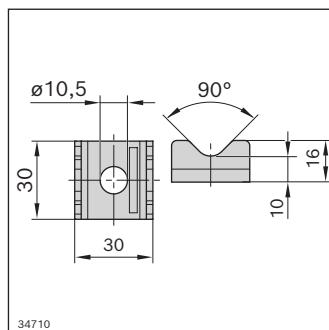
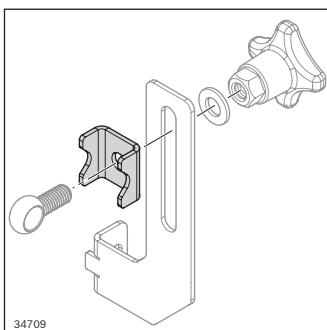
Clamping holder D12 L80


No.

10 3 842 571 169

Material: Clamping head: PA;
Clamping rod, fastening material:
Steel; non-rusting

Accessories: Stainless steel holder, clamping bracket, star knob



- Clamping bracket for secure fastening of the clamping holders at the stainless steel holder

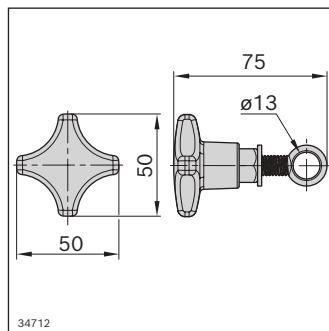
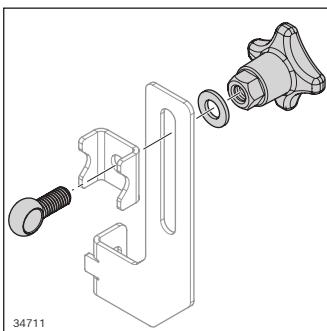
Clamping bracket


No.

10 3 842 571 173

Material: Steel; stainless

Accessories: Stainless steel holder, star knob



- Star knob with eye for quick, easy adjustment of the clamping holders L80

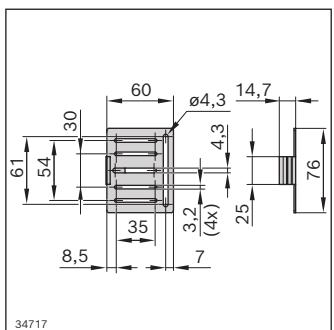
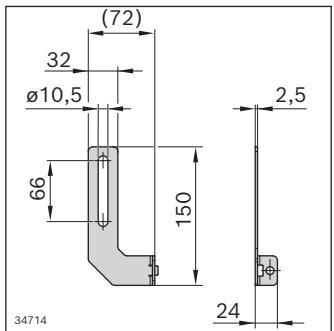
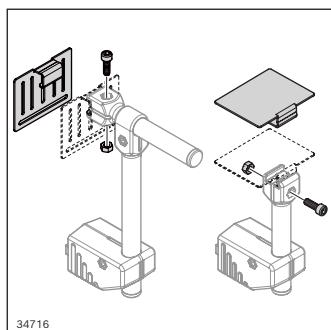
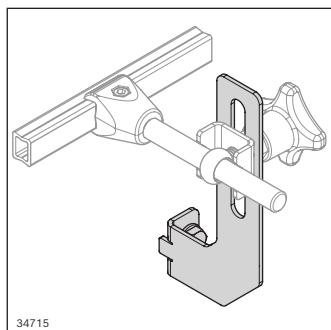
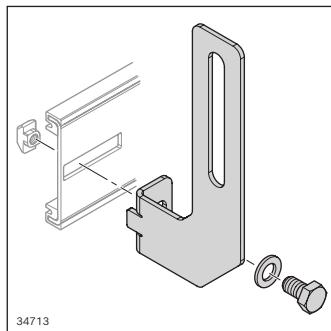
Star knob


No.

10 3 842 571 174

Material: Star knob: PA;
Thread, eye: Steel; non-rusting

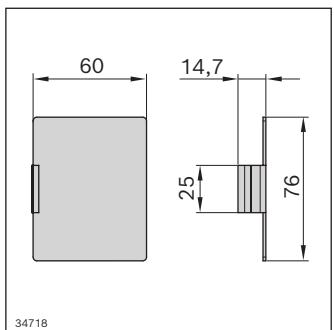
Accessories: Stainless steel holder, clamping bracket, clamping holder L80



- Stainless steel holder for increased hygiene requirements with variable height and width adjustment
- Holder for fastening clamping holders C L80, D12 L80
- Slot for variable installation heights and use of one or two clamping holders
- Variable guide widths possible

Holder STS	No.
Set	10 3 842 571 165
ZB T-nut for AL	100 3 842 530 285
ZC T-nut for STS	20 3 842 546 706

Material: Steel; stainless
 Scope of delivery: Incl. fastening material (except for T-nuts)
 Accessories: T-nut for AL or STS
 Clamping bracket, star knob, clamping holder L80



- Sensor support for mounting common sensors and reflectors with finished hole pattern

Sensor support	No.
	3 842 571 203

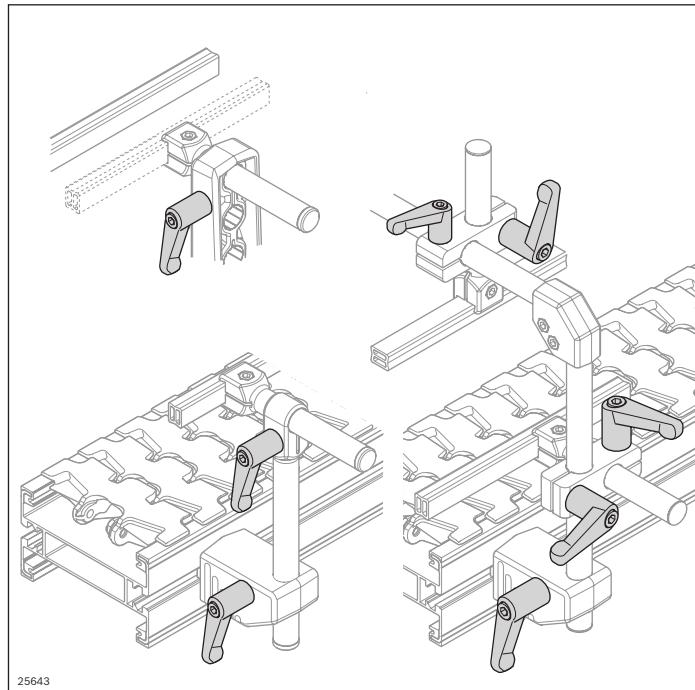
Material: Non-rusting steel 1.4301
 Accessories: Clamping holder C L100 (**M**); clamping holder C (**N**); clamping head (**Q**), clamping holder C L80

- Sensor support for fastening customized sensors and reflectors
- Hole pattern must be made as required

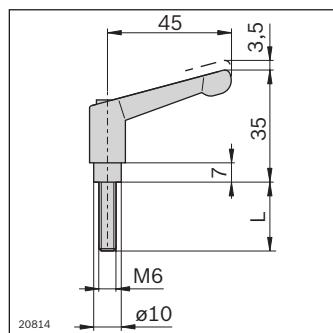
Sensor support	No.
Variable	3 842 571 204

Material: Non-rusting steel 1.4301
 Accessories: Clamping holder C L100 (**M**); clamping holder C (**N**); clamping head (**Q**), clamping holder C L80

Clamping lever



- For easy adjustment of lateral guide holders
- Clamping lever M6x25 for the cross piece
- Clamping lever M6x40 for the holder



Clamping lever	L (mm)	No.
M6x25	25	3 842 528 540
M6x40	40	3 842 528 539

Material: Lever: Diecast zinc; black plastic coated
Screws: Steel; galvanized and black chromated

Pressure roller



Enables the cost-effective vertical transport of light products. The contact pressure on the flat conveyor chain increases the friction, thereby enabling reliable transport in a vertical section.

- Vmax: 60 m/min
- Max. product weight depending on the conveying angle (see table)
- Operating temperature: 0 – 60 °C
- Clean and dry environment
- No transport of sharp-edged products
- No direct UV radiation
- Minimum product length about 60 mm (both sides of roller)
- Minimum product length about 90 mm (one side of roller)
- For safe transport, a flat, stable product surface is required
- Product height ≤ product length ≤ product width
- Tolerance of the product height +/- 1 mm

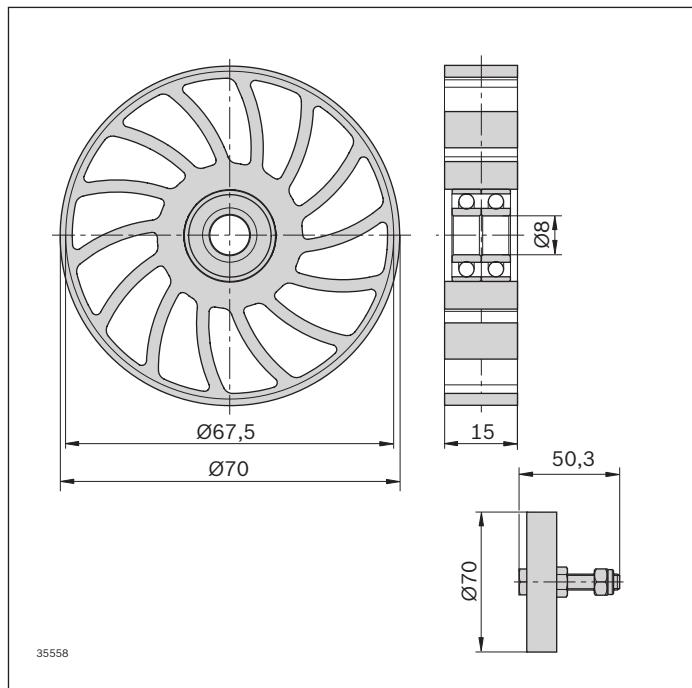
The pressure rollers with ball bearing are installed by the customer in short distances on the profile rail 3 842 993 887 (which is provided with holes by the customer). The components from the lateral guide range serve as connections to the conveyor section.

Scope of delivery:

- Incl. fastening material

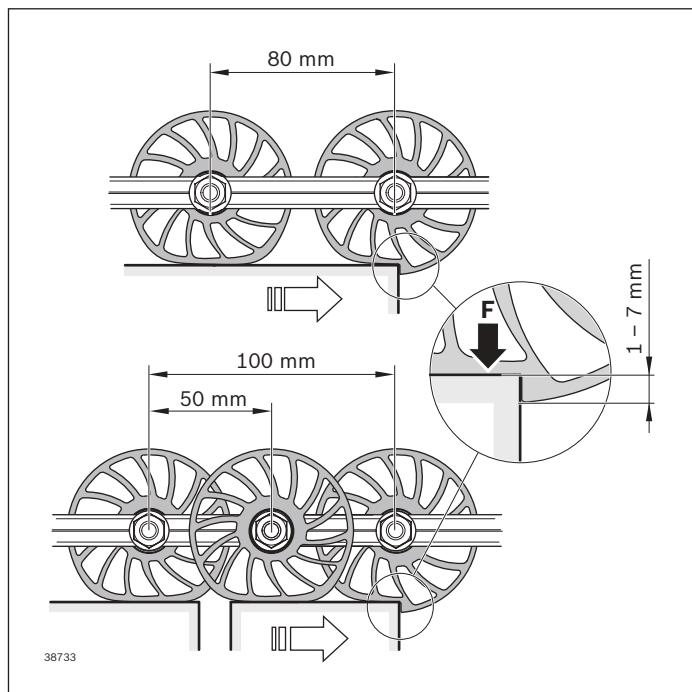
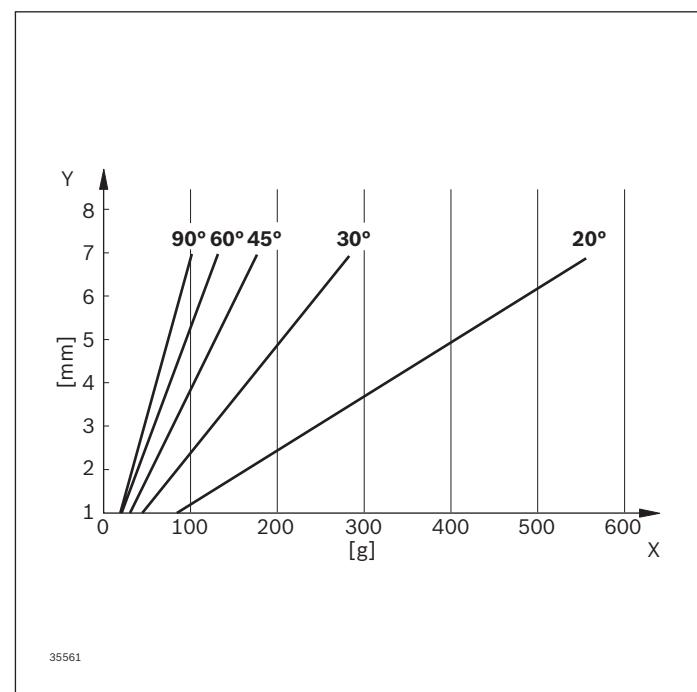
Material:

- Ball bearing: Non-rusting steel, sealed on both sides
- Roller: PU

**Pressure roller** **No.**

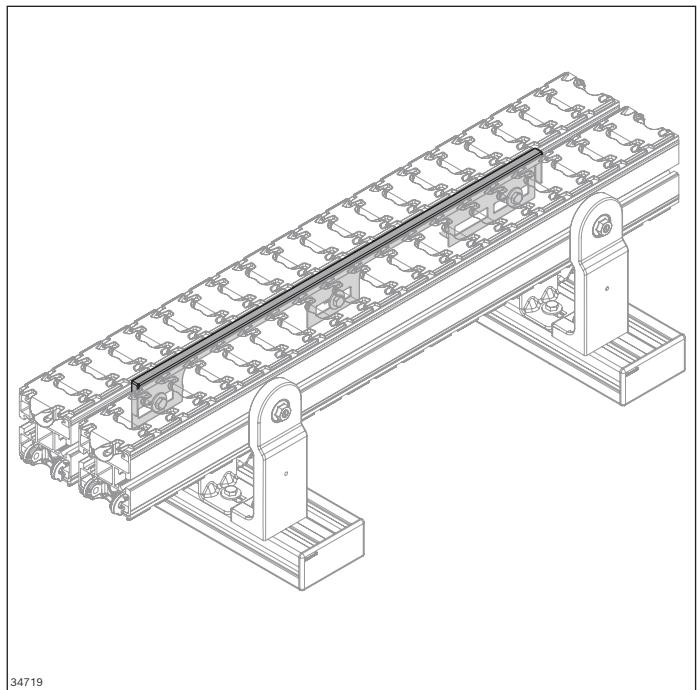
10 3 842 552 950

7

Pressure roller indentation depth**Product weight depending on the conveying angle**

Y-axis: Pressure roller indentation depth in (mm)
 X-axis: Product weight in (g)

Sliding plate



Sliding plate for reliably bridging the conveyor trench between two parallel section profiles

10 mm

	AL	AL
	65-120	160-320
Drive	parallel offset	Yes ¹⁾ Yes
		No Yes

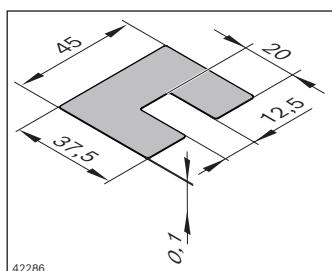
¹⁾ Remove inner chain guard plate

14 mm

	AL	STS
	65-320	65-320
Drive	parallel offset	Yes Yes
		No Yes ²⁾

²⁾ Incl. QV

Notice: A simple connection of parallel sections at a distance of 10 mm is possible with the aid of the Quick connector (3 842 564 742).



Spring plate (to be produced by the user)

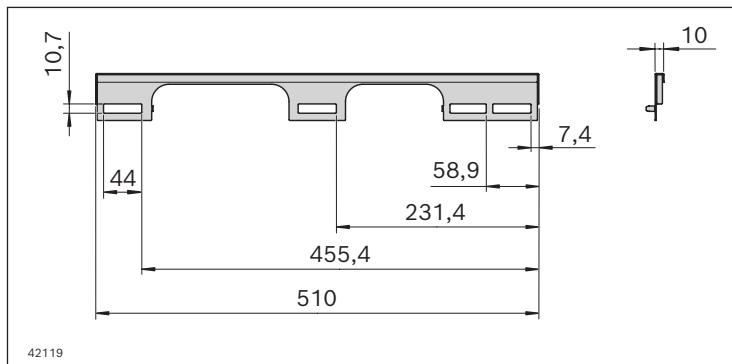
- ▶ Simple assembly thanks to pluggable screwed connection
- ▶ Depending on the product geometry, a small height offset of the sections may be necessary for a trouble-free product transfer. For this purpose, the 10 mm supporting brackets (3 842 572 257) can be supported by spring plates (to be produced by the user).

Scope of delivery:

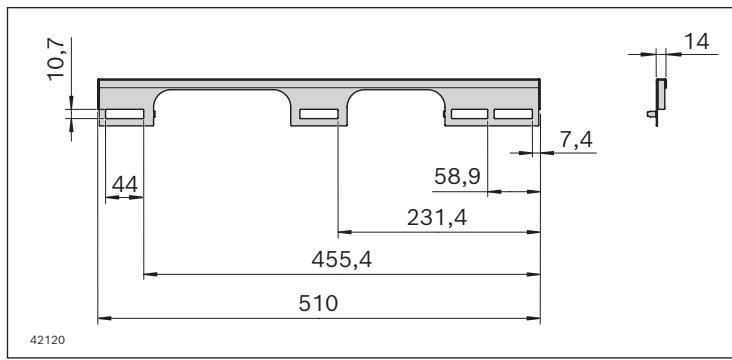
- Incl. fastening material

Material:

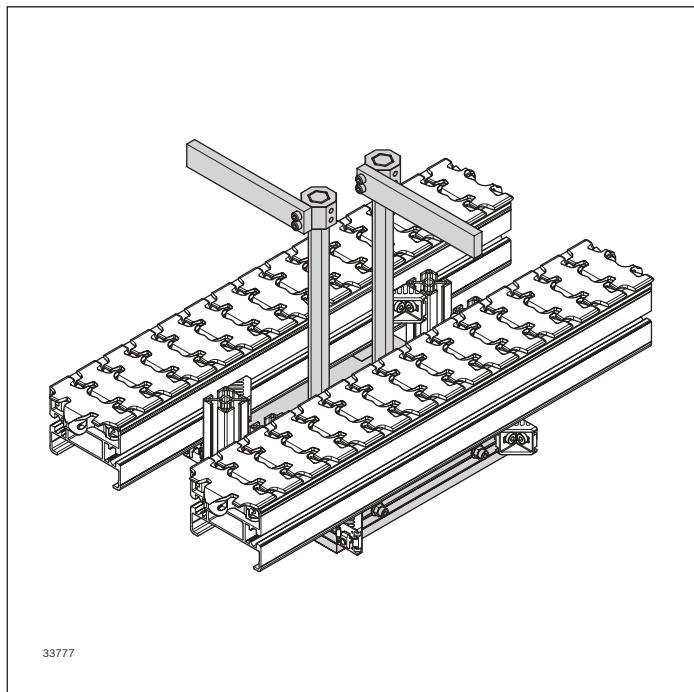
- Non-rusting steel 1.4301



Sliding rail VFplus	No.
10 mm	3 842 571 247
14 mm	3 842 571 248



Barrier



For the control-free merging of two sections into one. The product that arrives first has right of way (Traffic Police).

- Size: all track widths
- Only suitable for dry operation
- The height of the barrier arm should be set as close as possible to the surface of the chain (any protrusion can be shortened if necessary)
- Minimum clearance between parallel sections: 40 mm
- Minimum-maximum load: see diagram on page 245
- For higher loads, the accumulation pressure must be reduced, e.g. via pre-separation

- ▶ Barrier length adjustable to product width
- ▶ Reducing accumulation pressure through pre-isolation

Scope of delivery:

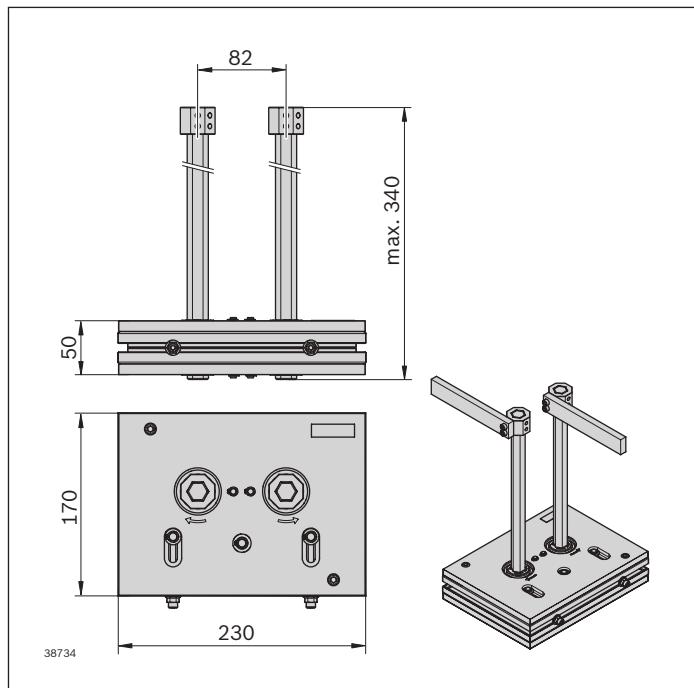
- Incl. fastening material (includes all necessary basic components for installation)

Material:

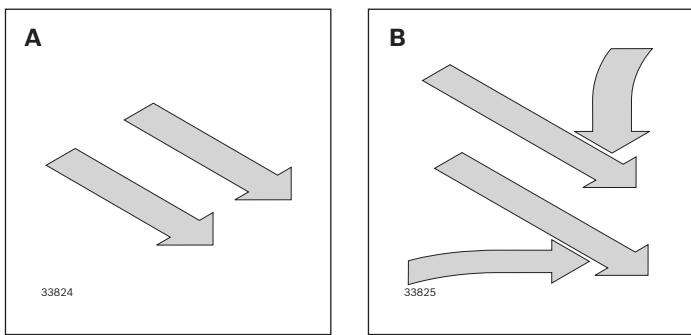
- Aluminum, steel

Condition on delivery:

- Some assembly required

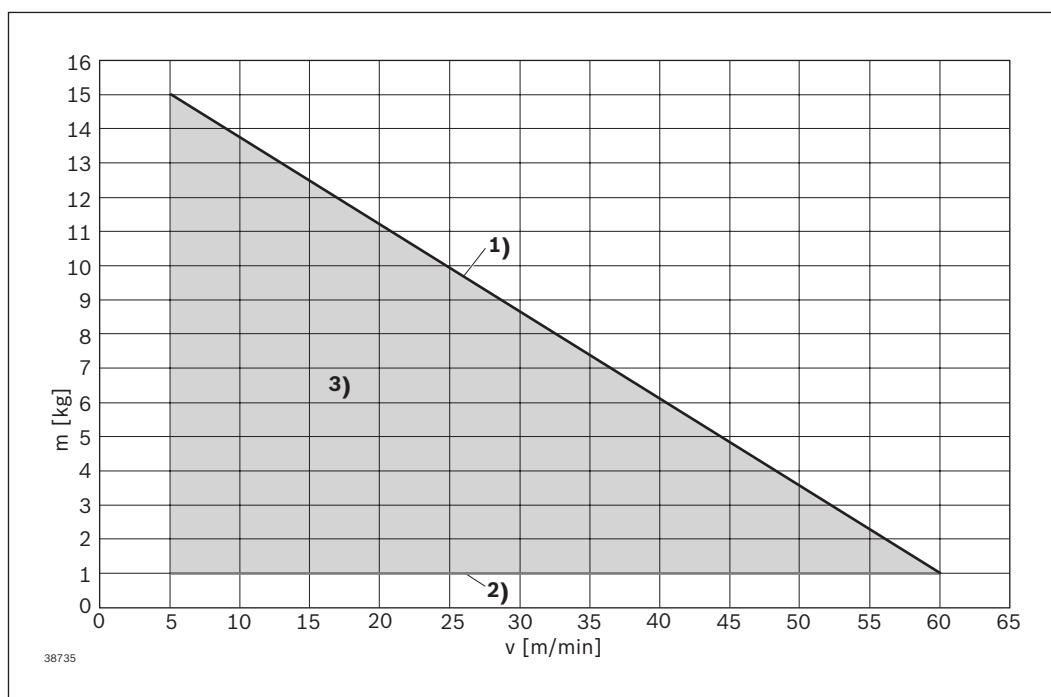


Barrier	No.
	3 842 553 070



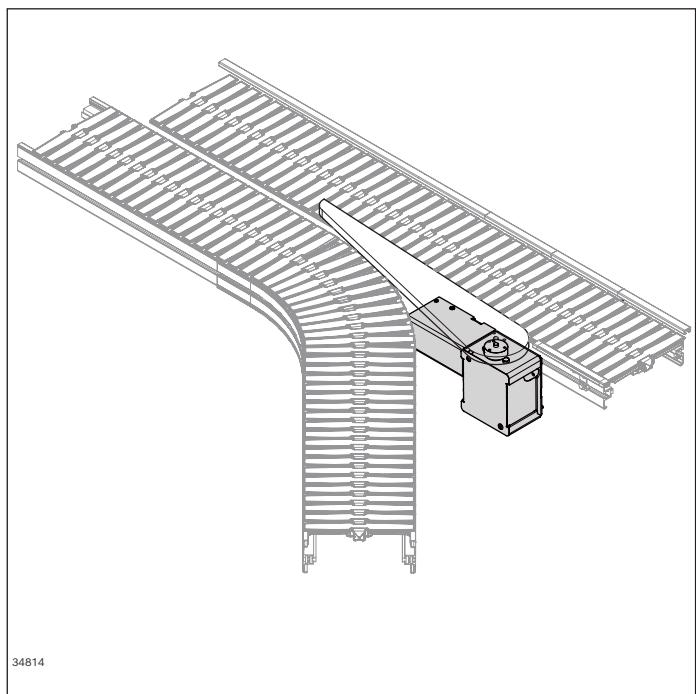
A: Standard solution, scope of delivery
B: Adaptation of the barrier by the customer possible via
 MGЕ components

Minimum/maximum load



m (kg) weight
 v (min/max) speed
 1) Maximum load
 2) Minimum load
 3) Permissible range

Universal diverter



Required accessories:

- Diverter arm
- End stop (open/branch: against lateral guide or on user-side)
- For the cylinder:
 - 2x G1/8" throttle check valves
 - 2x sensors
 - 2x sensor supports
 - 1x 5/2 directional valve
- Cylinder description ISO 6432 with:
 - Piston ø25
 - Piston rod thread M10x1.25
 - Connections G1/8"
 - Piston rods ø10
 - Cylinder outer thread M22x1.5

For changing tracks between main and secondary section

- Size: all track widths (max. product width = chain width)
- Pneumatically operated
- Max. product weight: 20 kg
- Can be mounted on both sides
- Required compressed air connection: 5 ... 6 bar

Notice:

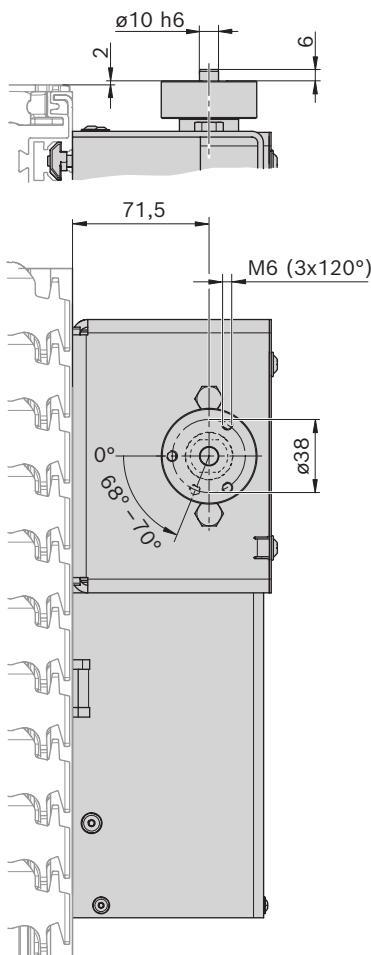
- The diverter arm and the end stop must be prepared by the user depending on the track width and product size
- For stability reasons, the closed section profile must be used for track widths 65-120, or, if open section profiles are used, two cross connectors must be used in the fixing area of the universal diverter

Scope of delivery:

- Partially assembled kit

Material:

- Steel, aluminum, PC



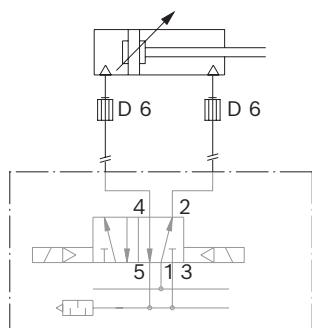
Universal diverter

No.

3 842 547 703

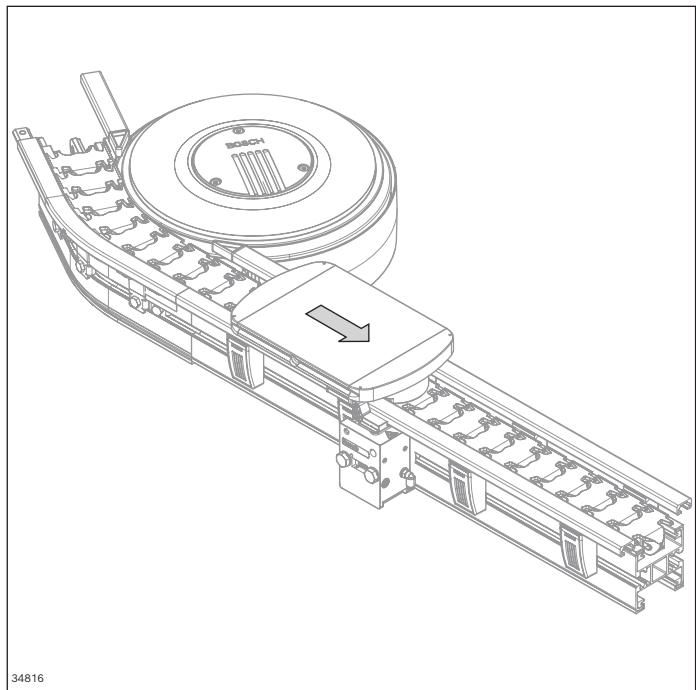
7

Circuit diagram

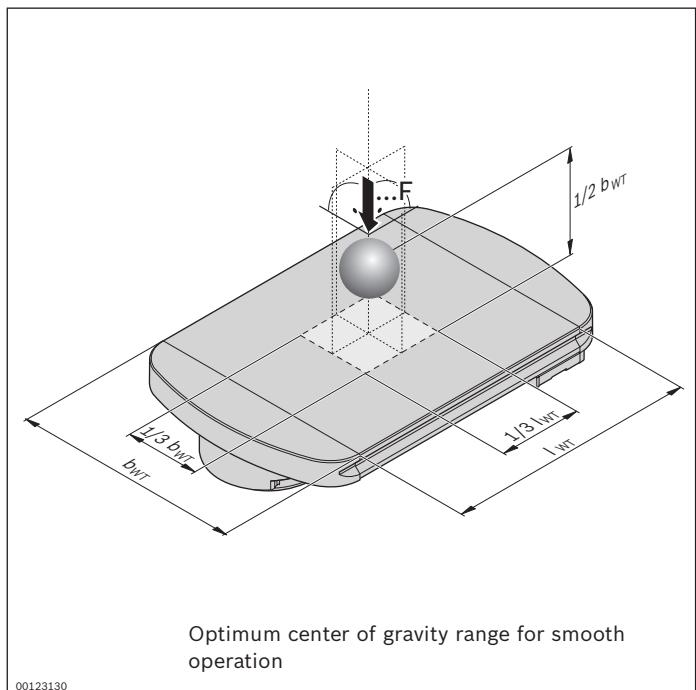


34815

Workpiece pallet system (WT)

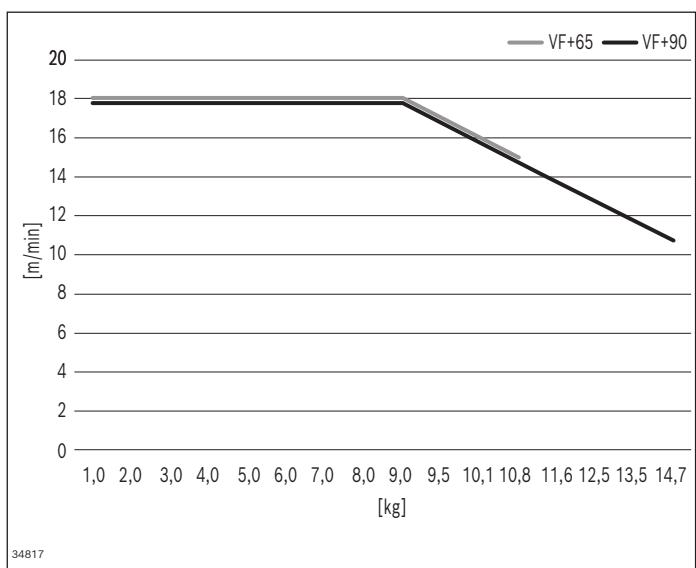
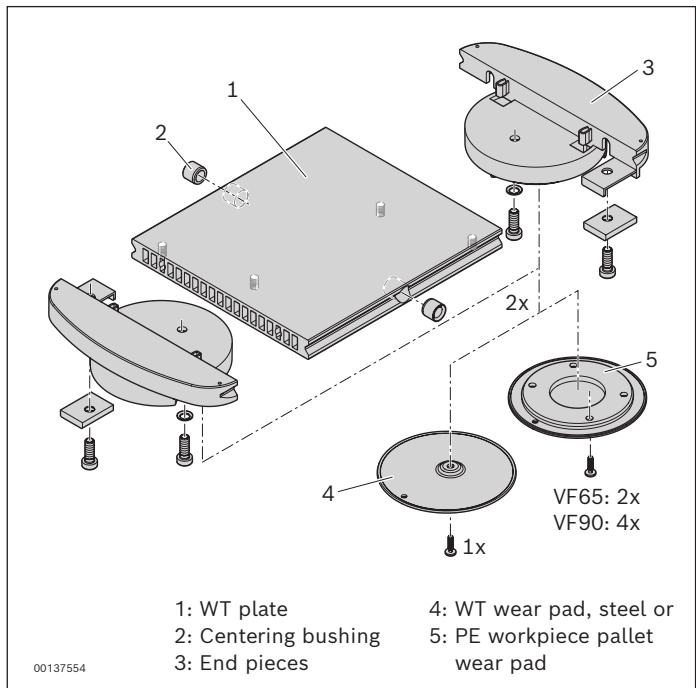


- ▶ Secure transport of parts thanks to the modular design with comprehensive additional components
- ▶ Numerous components for WT control such as diverter, stopper, positioning unit, etc.
- ▶ Selection of wear pads with different materials
- ▶ Compatible with the ID 15 identification system



	VarioFlow workpiece pallet (WT)	250
	WT plate End piece	252
	Lateral guide for workpiece pallets	254
	Curve wheel lateral guide	258
	Stop gate	260
	Return stop WT	262
	Stop gate position sensor	264
	Switch bracket	266
	Positioning unit	272
	Section transfer	280
	Diverter	282
	Junction	290
	Rocker WT system	294

VarioFlow workpiece pallet (WT)



For transporting products that are not suitable for accumulation operation or are unstable due to their geometry

- Max. transport speed for operation with workpiece pallets: $v_N = 18 \text{ m/min}$
- WT wear pads either made of:
 - Steel, for use in harsh environments
 - PE, for use in clean environments
- Permissible WT weight (WT, workpiece, holder, etc.) as a function of speed, see diagram
- The modular concept allows for WT lengths of up to 500 mm*. With centering bushings for positioning in the positioning unit.

* For WT with $L > 300 \text{ mm}$ 2, combine curve wheels 90° with intermediate section (min. 200 mm).

Max. WT length (incl. end pieces) for 180° curve wheel:

- Size 65: 360 mm
- Size 90: 410 mm

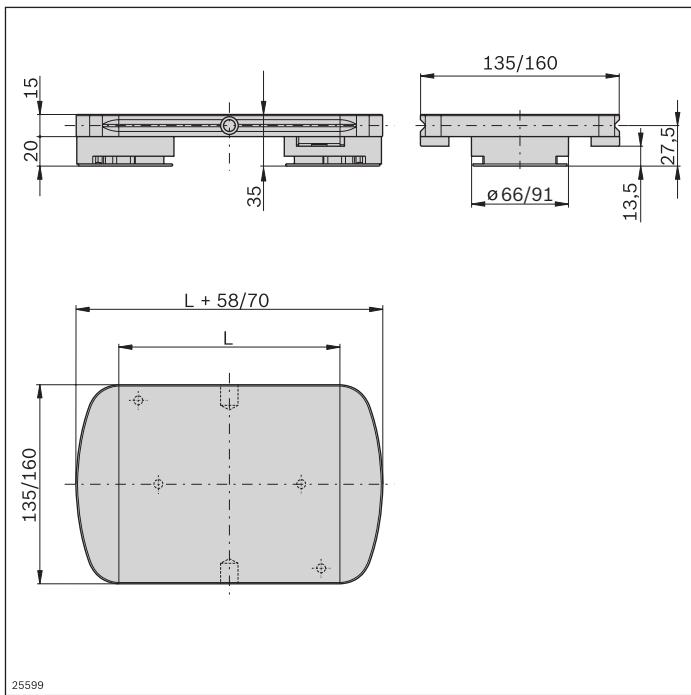
- Minimum length of the workpiece pallets:
 - Size 65: $L_{\min} = 76 \text{ mm}$
 - Size 90: $L_{\min} = 114 \text{ mm}$
- Minimum length of the workpiece pallets in order to be positioned by the positioning unit (see p. 272):
 - Size 65: $L_{\min} = 125 \text{ mm}$
 - Size 90: $L_{\min} = 125 \text{ mm}$

Minimum length WT for passive bridge $L \geq 300$

- ▶ Level WT surfaces with no indentations
- ▶ The entire top of the WT can be built upon since everything else on the section is ready-mounted below the top of the WT
- ▶ Compatible with identification systems ID 15 and ID 200
Integrated installation of a mobile data tag is possible
- ▶ The product can also protrude beyond the WT if the position of the center of gravity is taken into consideration

Material:

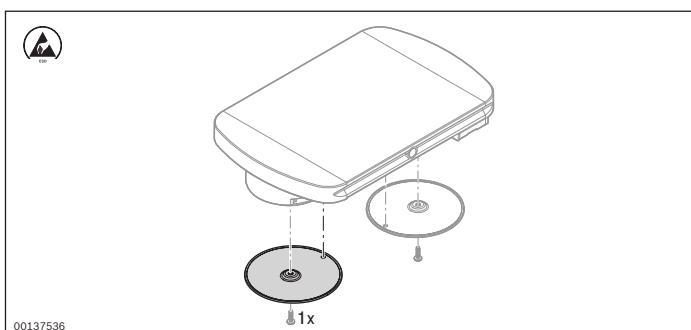
- WT plate: Aluminum; natural, anodized
- End pieces: PA; black
- Workpiece pallet wear pads: Steel, stainless, $\text{HV} \geq 480$ or PE



Workpiece pallet ¹⁾	L (mm)	No.
VFplus 65	150	1 3 842 541 888
VFplus 90	175	1 3 842 541 889

¹⁾ Mounted without wear pad, with positioning bushing

The mounted workpiece pallet must be provided with wear pads (steel or PE) by the customer.

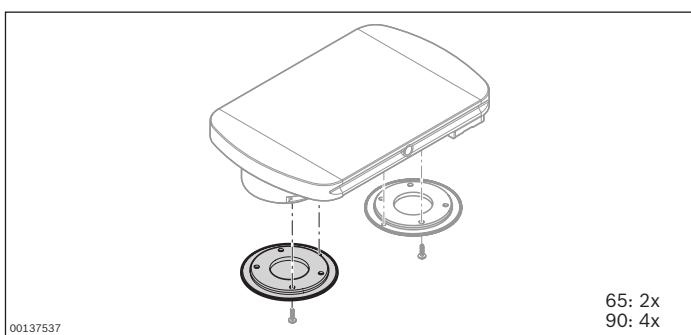


Steel wear pad	No.
VFplus 65	10 3 842 528 773
VFplus 90	10 3 842 528 772

Required accessories:

- Screw **3 842 543 246** (not in scope of delivery)

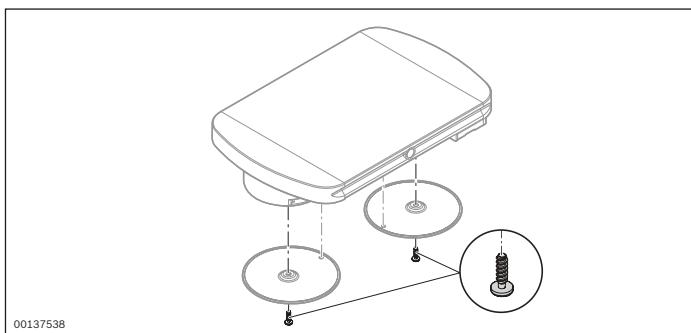
Notice: We recommend using the gray chain, see p. 19.



Wear pad PE	No.
VFplus 65	10 3 842 541 566
VFplus 90	10 3 842 541 567

Required accessories:

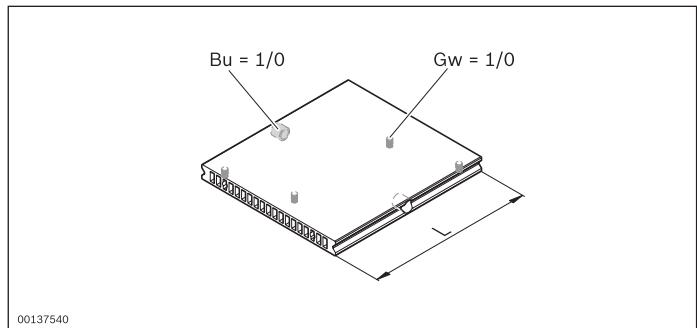
- Screw **3 842 543 246** (not in scope of delivery)



Screw	No.
100	3 842 543 246

WT plate

End piece



WT plate	Bu	Gw	L (mm)	No.
VFplus 65	0; 1	0; 1	30 ... 6000	3 842 996 204/...
VFplus 90	0; 1	0; 1	30 ... 6000	3 842 996 205/...

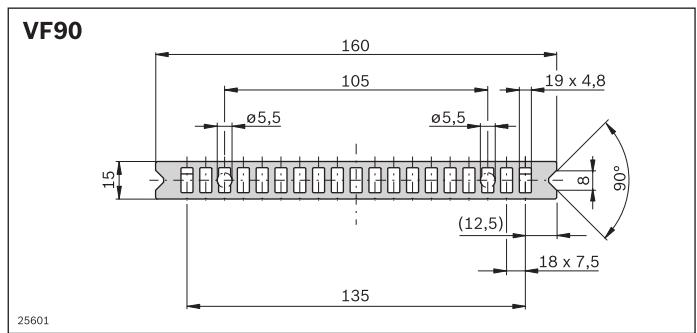
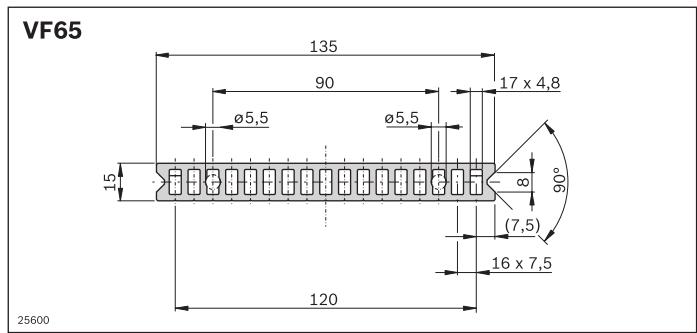
Parameter	Size	L _{min} (mm)	L _{max} (mm)
Bu = 1	65/90	125	500
Gw = 1	65	76	500
	90	114	500

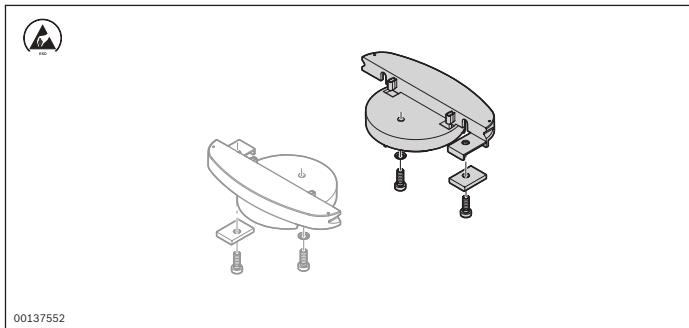
Bu = 1: with holes for centering bushings for positioning in the positioning unit (centering bushings not in scope of delivery)

Bu = 0: without holes for centering bushings

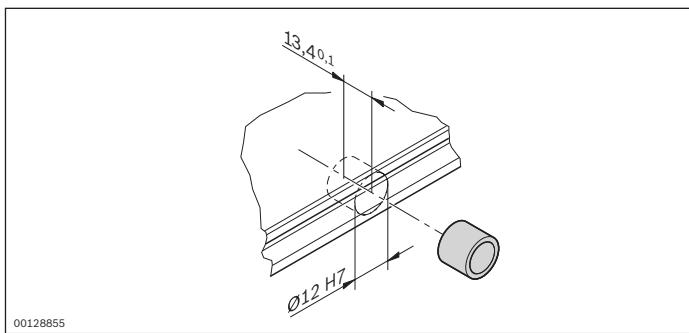
Gw = 1: with thread for assembly of the end pieces

Gw = 0: without thread for the assembly of the end pieces



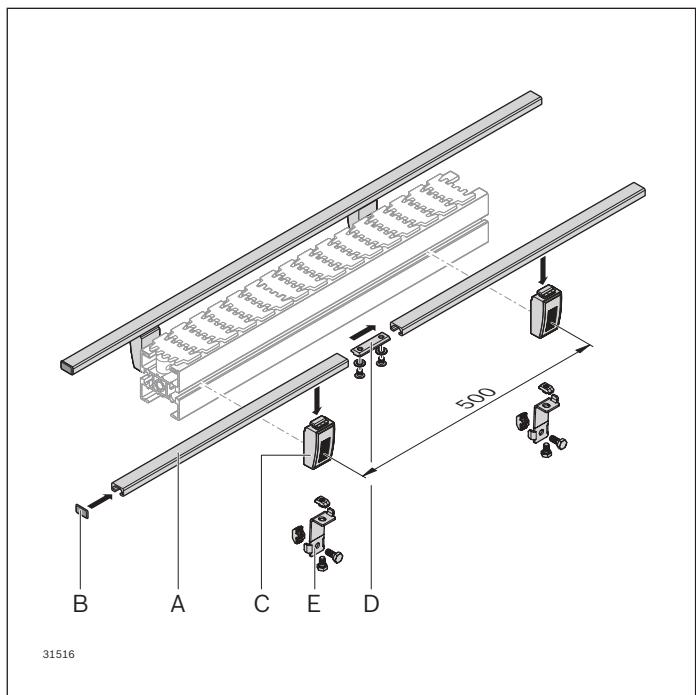
**End piece**

	 No.
VFplus 65	10 3 842 541 902
VFplus 90	10 3 842 541 903

**Centering bushing**

	 No.
	1 3 842 535 081

Lateral guide for workpiece pallets



- ▶ Strut profile (**A**) to laterally guide the workpiece pallets
Pre-bent lateral guides for curves available on request
- ▶ Profile connector (**D**) to connect the end face of the profiles (**A**)
- ▶ Cover cap (**B**) to protect dirt from entering and injuries at open profile ends.
- ▶ Lateral guide holder (**C**) for simple installation in straight sections
- ▶ Lateral guide HD holder (**E**) in robust design for straight sections and in the curve area
- ▶ Distance of the holders (**C, E**) in the conveying direction: 500 mm
- ▶ Number of holders (**C, E**) in the curve area:
3 holders recommended

- ▶ Lateral guide of the workpiece pallets

Optional accessories:

- **A:** Bending tool for lateral guide: see p. 302

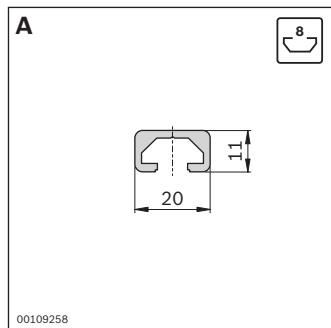
Scope of delivery:

- **C, D, E:** Incl. fastening material (as shown)

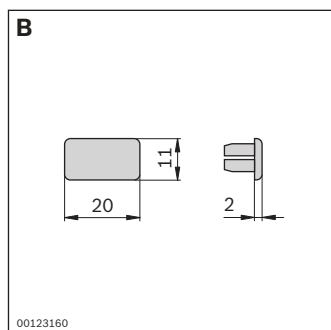
Material:

- **A:** Aluminum; natural, anodized
- **B, C:** PA; black
- **D:** Steel; zinc-plated
- **E:** Non-rusting steel 1.4301

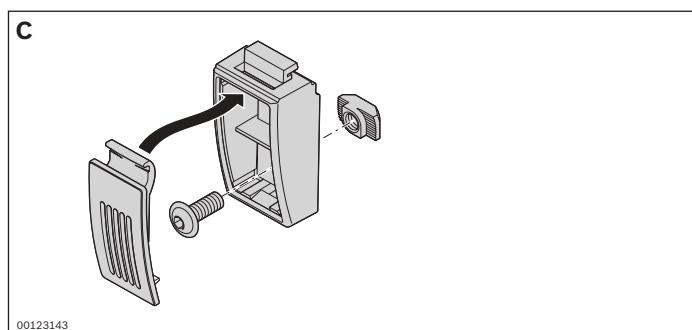
Fastening material: Steel; galvanized



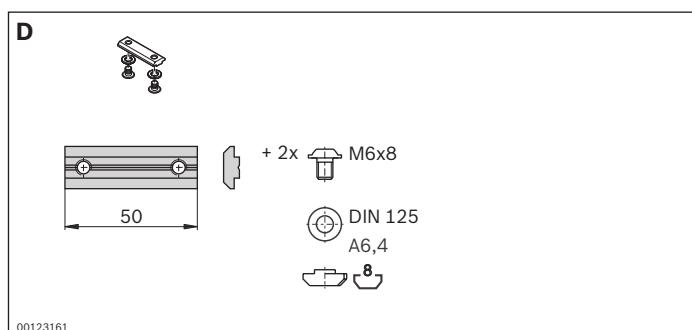
Strut profile 11x20		L (mm)	No.
A	10 pcs	2000	3 842 513 581
A	1 pc	30 ... 2000	3 842 992 476/...



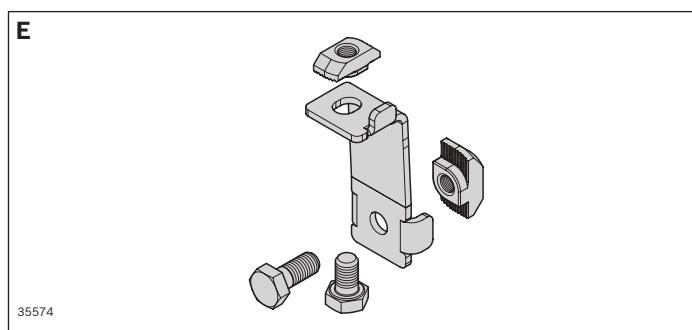
Cover cap 11x20		ESD	No.
B	Black		20 3 842 551 045
B	Signal gray		20 3 842 551 044



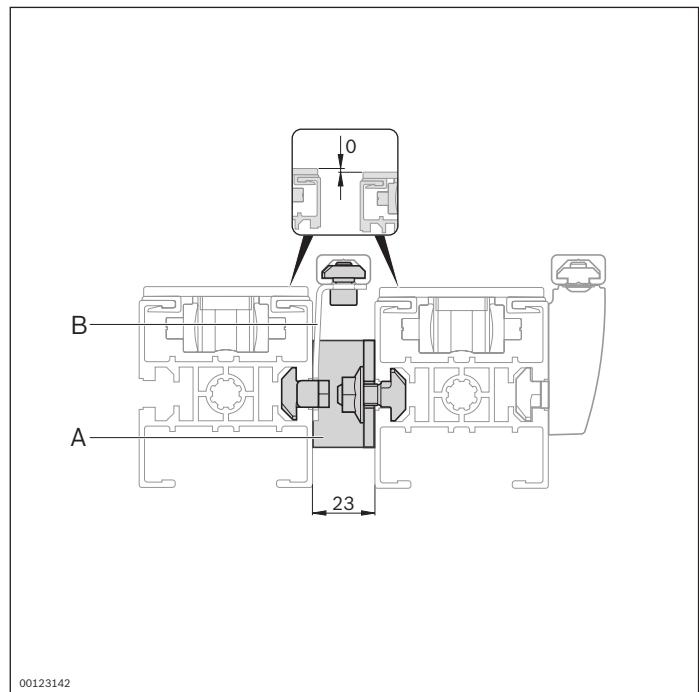
Lateral guide holder		No.
C		10 3 842 531 552



Profile connector		No.
D		10 3 842 536 787



Lateral guide holder HD		No.
E		10 3 842 557 005

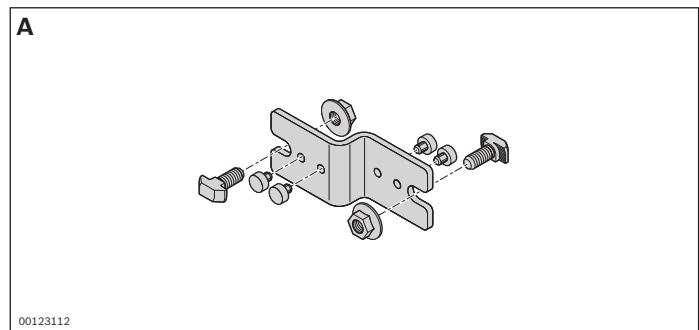


The middle lateral guide is used alternately by both sides. The section link (23 mm) (A) is used in combination with the holder for lateral guides (23 mm) (B) as a spacer between sections.

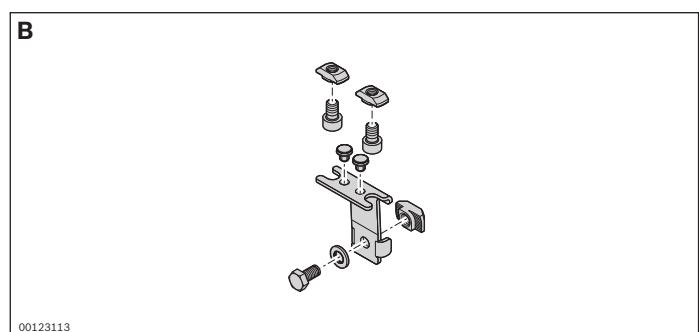
- The use of a section transfer (see p. 280), diverter (see p. 282) or junction (see p. 290), requires parallel section spacing of 23 mm.

Material:

- **A, B:** Non-rusting steel
- Fastening parts: Steel, galvanized

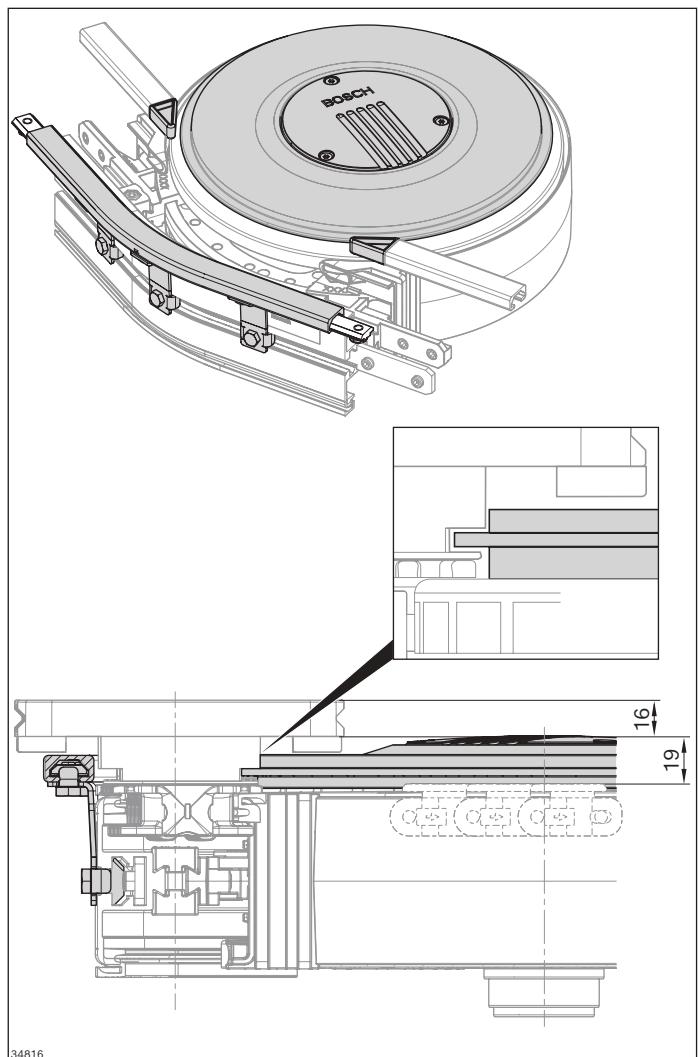


Section link	No.
A	10 3 842 532 998



Holder for lateral guide	No.
B	10 3 842 532 980

Curve wheel lateral guide



Lateral guide of the workpiece pallets (WT) in the curve wheel or curve wheel drive.

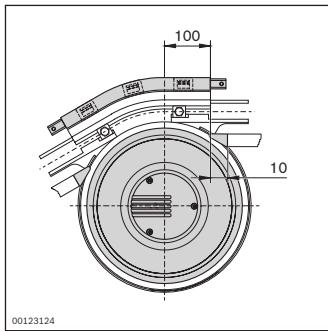
- Prevents the WT from ascending in accumulation operation or tipping over at high conveying speeds
- Complete kit for mounting on an existing curve wheel or curve wheel drive
- Lateral guide for curve wheels with other angles as well as lateral guide for curves available on request

Scope of delivery:

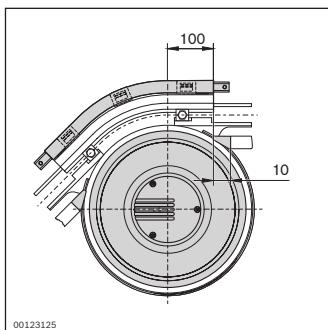
- Kit incl. fastening parts (as shown)

Material:

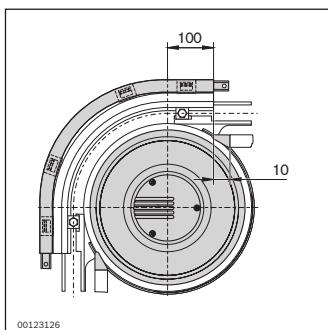
- Guide rail: Aluminum; natural, anodized
- Guide disc, holder: PA, black
- Fastening parts: Steel, galvanized

**30° lateral guide****No.**

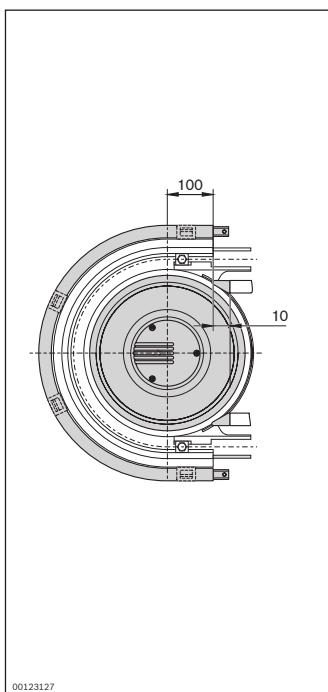
VFplus 65	3 842 547 949
VFplus 90	3 842 547 953

**45° lateral guide****No.**

VFplus 65	3 842 547 950
VFplus 90	3 842 547 954

**90° lateral guide****No.**

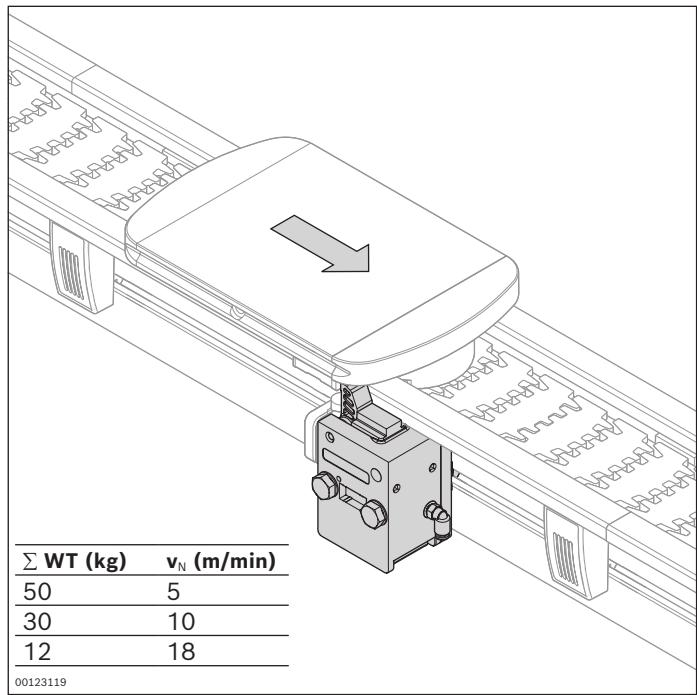
VFplus 65	3 842 547 951
VFplus 90	3 842 547 955

**180° lateral guide****No.**

VFplus 65	3 842 547 952
VFplus 90	3 842 547 956

Stop gate VE-VF

Stop gate VE-VF/M



Stop gate for securely stopping a workpiece pallet

- Suitable for retrofitting without disrupting the lateral guide
- The stop gate can be installed in any position
- Switch bracket for installation on stop gate see p. 266, max. accumulation load 50 kg
- Available in two versions:
 - VE-VF for dry or oily ambient conditions (50% higher maximum permissible total weight in oily environment)
 - VE-VF/M for corrosive ambient conditions
 - Required compressed air connection: 4 ... 6 bar

Scope of delivery:

- Incl. fastening parts (as shown)

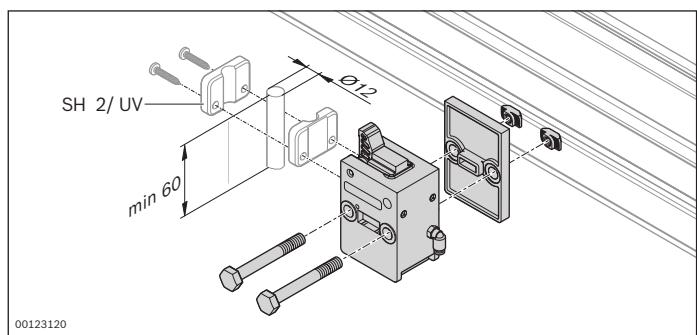
Material:

- Stop gate VE-VF: PA; black
- Stop gate VE-VF/M: PA; gray

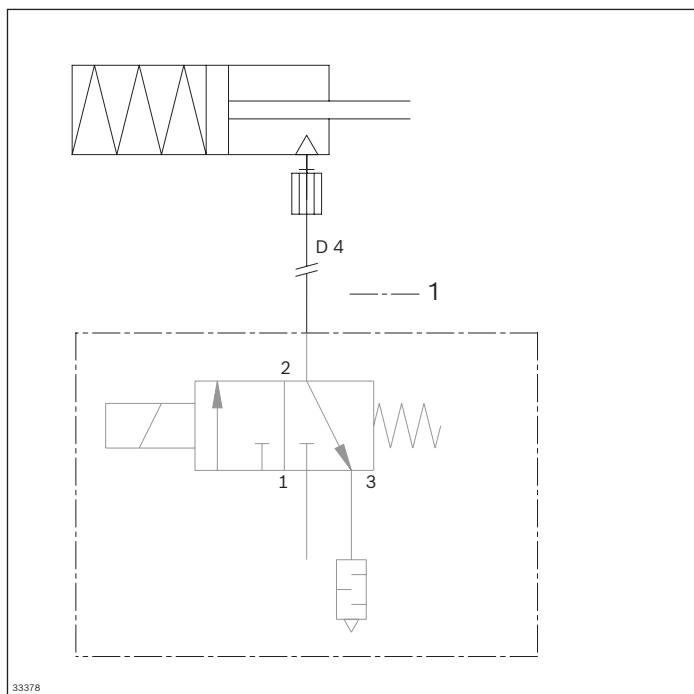
Functional components in the stop gate:

Non-rusting steel 1.4301

- Fastening material: Steel; galvanized

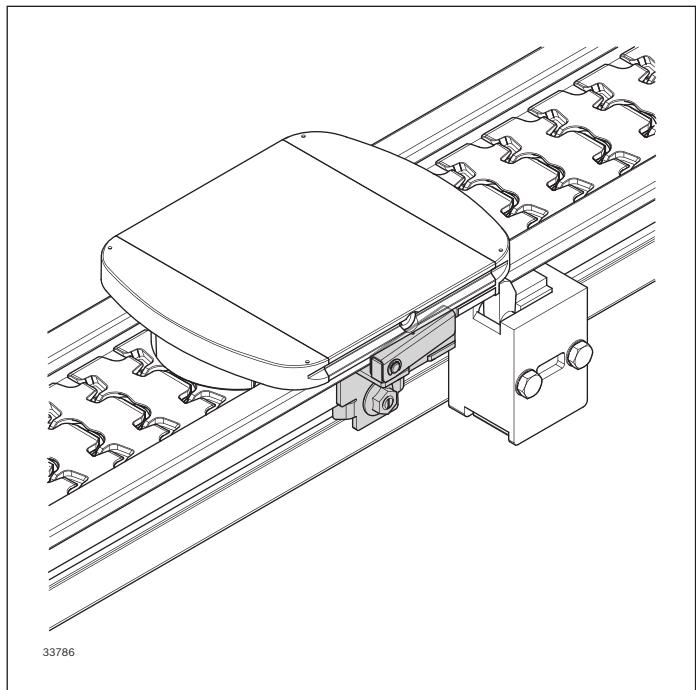


Stop gate	No.
VE-VF	3 842 528 852
VE-VF/M	3 842 559 135

Circuit diagram

1 Not included in the scope of delivery

Return stop WT



The return stop prevents the VarioFlowplus workpiece pallet from rebounding from the stop gate or prevents a backward movement of the workpiece pallet when the chain is turned off and released.

- Additional WT load max. 8 kg
- The return stop is attached behind the WT stop surface.

- ▶ Can be attached both left and right on the section profile
- ▶ Simple and low-cost construction
- ▶ Non-rotating

Scope of delivery:

- Incl. fastening material

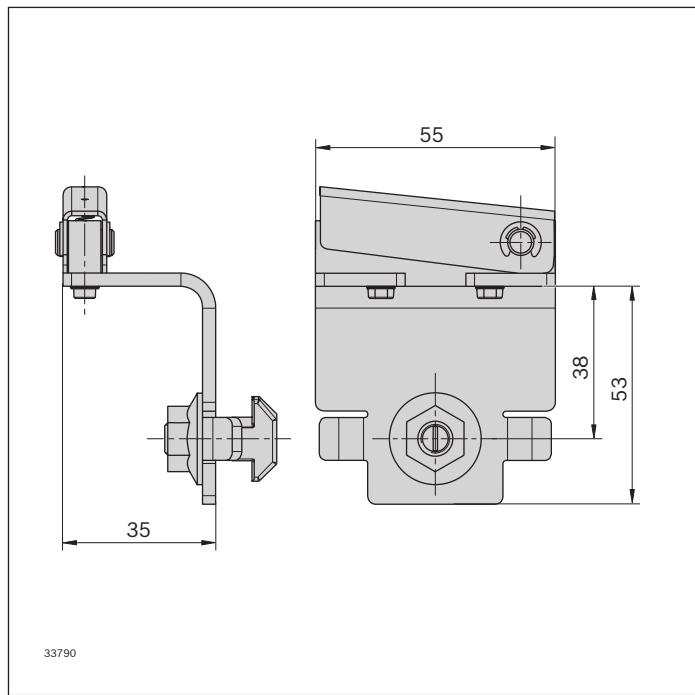
Material:

- Non-rusting steel 1.4301, galvanized steel, PA

- ▶ Also suitable for retrofitting without disrupting the lateral guide

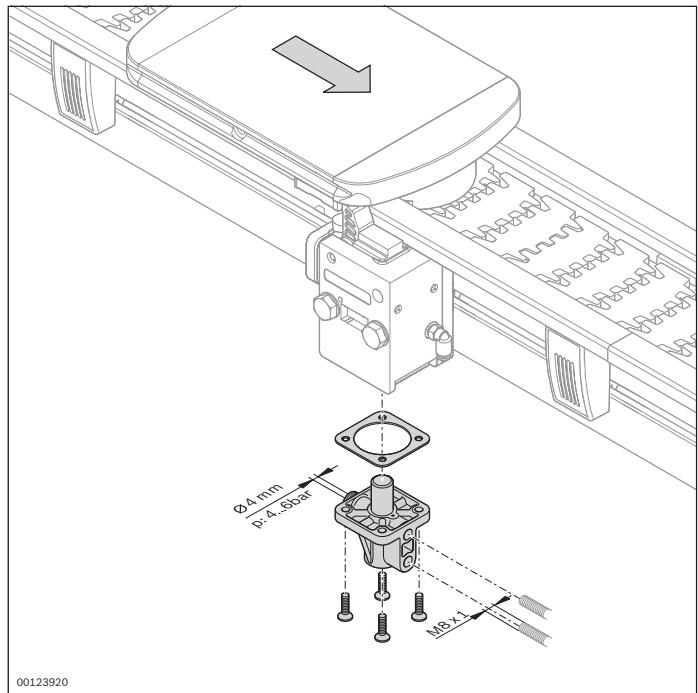
Condition on delivery:

- Assembled



Return stop	No.
	3 842 553 090

Stop gate position sensor



The stop gate position sensor is used to detect the position of the stop gate via sensors. The stop gate goes to the lock position via a spring in the pressureless state, but can also be optionally controlled pneumatically via the position sensor.

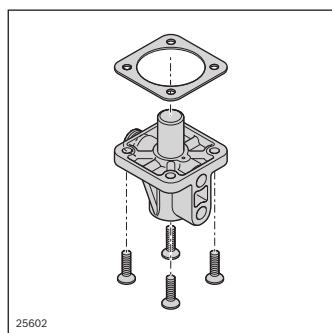
- Position sensor for querying the upper and lower positions
- Compressed air connection for double-action stop gate operation
- For retrofitting on the stop gate VE-VF and VE-VF/M
- Required compressed air connection: 4 ... 6 bar

Required accessories:

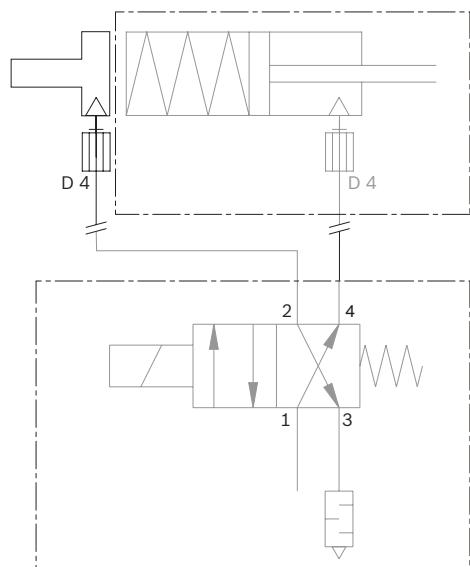
- 2x sensor M8x1 with rated switching distance $S_N \geq 2 \text{ mm}$, see. p. 270

Material:

- Position sensor: PA, black
- Fastening parts: Steel, galvanized



Stop gate position sensor	No.
	3 842 528 817

Circuit diagram

00126828

1 Not included in the scope of delivery

Switch bracket SH VF/U



- Switch bracket for 12 mm sensor
- Simple, fast mounting and replacement of the sensor without adjustment through flush installation with defined switching distance
- Changing the sensor is quick and easy by loosening a separate clamping screw. The switch bracket stays in position
- Inspection window to recognize the operating state of the sensor

- ▶ Suitable for retrofitting without disrupting the lateral guide
- ▶ The switch bracket can be installed in any position

Required accessories:

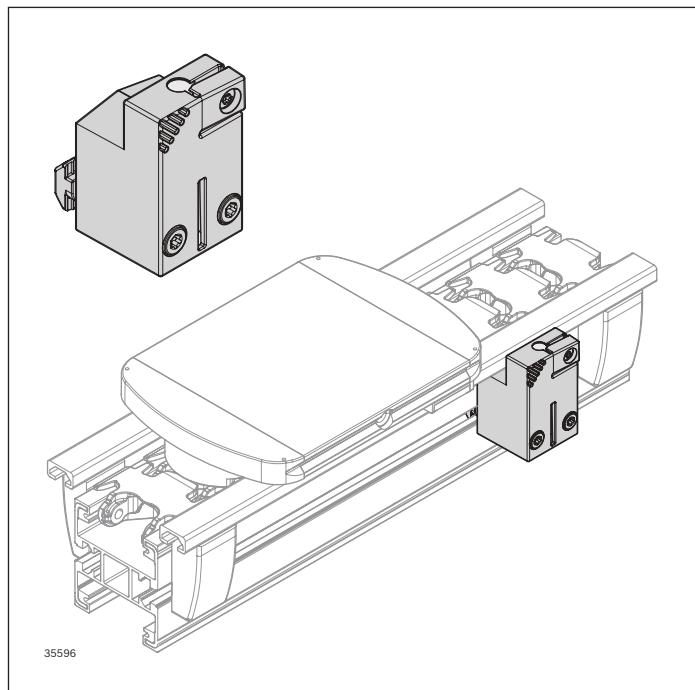
- Sensor M12 x 60, 3 842 558 990

Scope of delivery:

- Incl. fastening material

Material:

- Switch bracket: PA, black
- Fastening material: Steel; galvanized

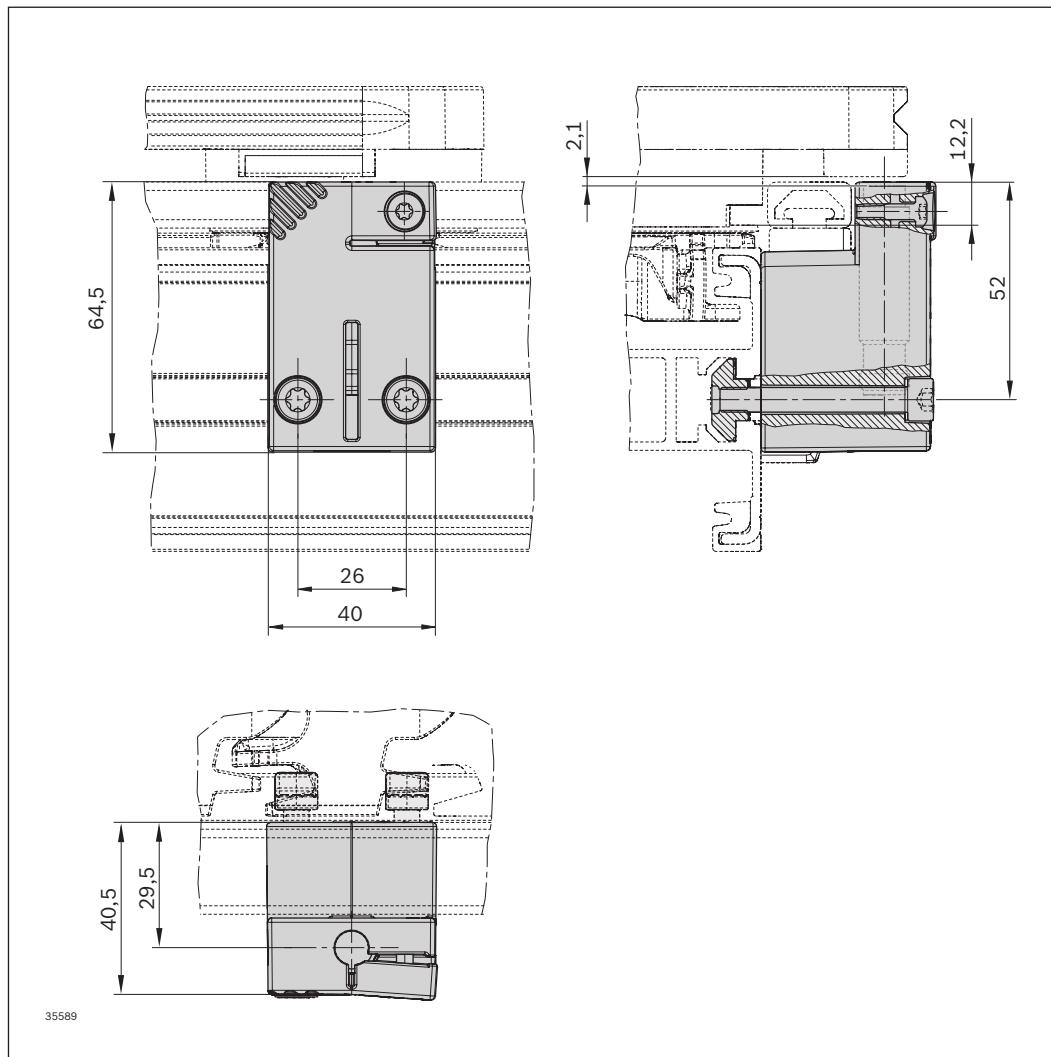


Switch bracket

No.

SH VF/U

3 842 557 603



Switch bracket SH VF/UV



- Switch bracket for a 12 mm sensor, for installing on stop gate VE 2/VF
- Simple, fast mounting and replacement of the sensor without adjustment through flush installation with defined switching distance
- Changing the sensor is quick and easy by loosening a separate clamping screw. The switch bracket stays in position

- ▶ Can be attached to both sides of the VE 2/VF stop gate
- ▶ For querying the workpiece pallet position before and/or after the stop gate

Required accessories:

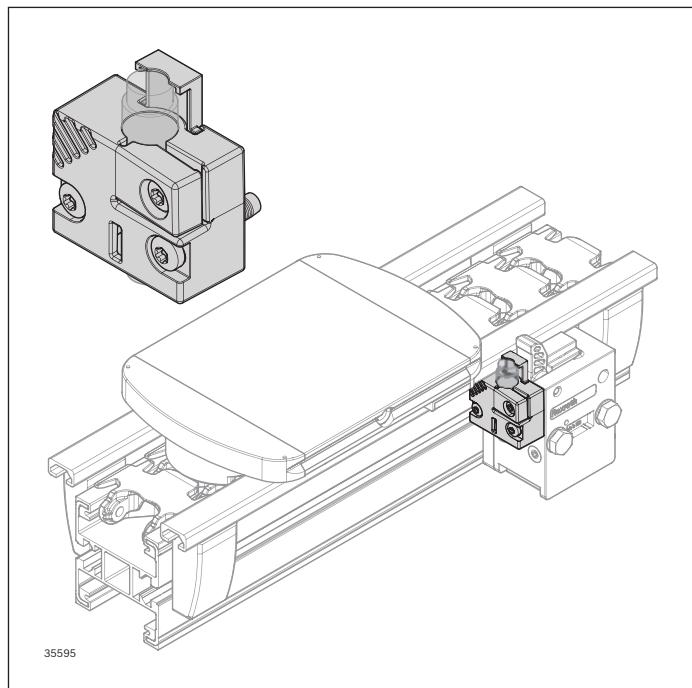
- Sensor M12 x 45, 3 842 557 633 or M12 x 44, 3 842 549 813

Scope of delivery:

- Incl. fastening material

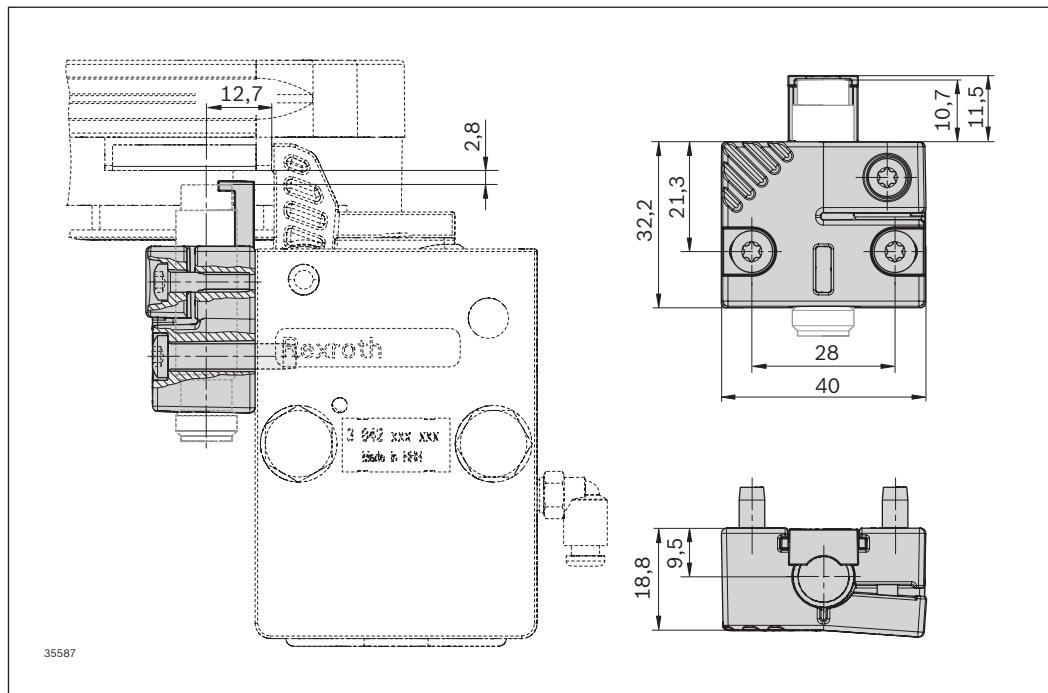
Material:

- Switch bracket: PA, black
- Fastening material: Steel; galvanized



Switch bracket	No.
SH VF/UV	3 842 557 601

8



Sensors



- ▶ Detecting the position of a workpiece pallet
- ▶ Stop gate / positioning unit position sensing

Required accessories:

- Switch bracket SH VF/U
- Switch bracket SH VF/UV
- Stop gate/positioning unit position sensor

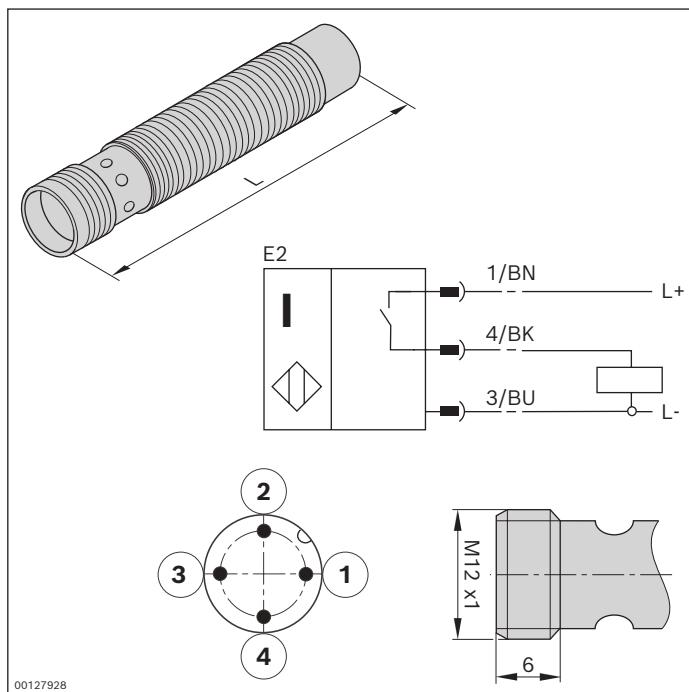
Sensor	No.
Sensor M12x45	3 842 557 633
Sensor M12x45	3 842 549 814
Sensor M12x60	3 842 558 990
Sensor M12x44	3 842 549 813
Sensor M12x43	3 842 572 961
Sensor M8x30	3 842 551 761

Sensor application matrix

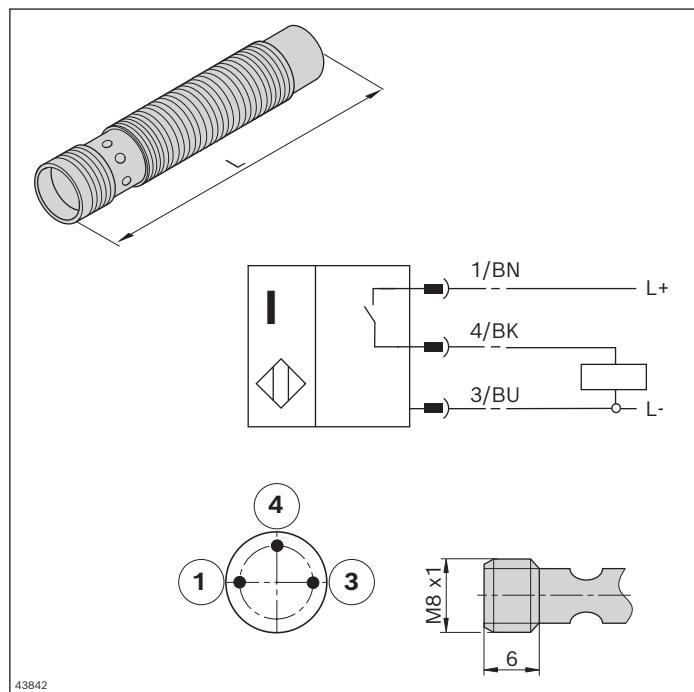
	Diameter with push-in fitting	Sensor	
	M12 with M12	3 842 557 633	3 842 558 990
	M12 with M8	3 842 549 813	3 842 572 961
	M8 with M8		3 842 551 761
Query WT position	SH VF/U	X	
	SH VF/UV	(X)	X
Stop gate position sensing	Position sensing		X
Positioning unit position sensing	Position sensing		X

Material number	3 842 557 633	3 842 549 814	3 842 558 990	3 842 549 813	3 842 572 961	3 842 551 761
Properties						
Protection rating	IP 68	IP 67	IP 68	IP 67	IP 67	IP 68
Material	Housing: CuZn; nickel-free coating, active surface: LCP	Housing: CuZn; nickel-free coating, active surface: LCP	Housing: CuZn; nickel-free coating Active surface: LCP	Housing: CuZn; nickel-free coating, active surface: PBT	Housing: CuZn; nickel-free coating, active surface: LCP	Housing: Non-rusting steel 1.4301 Active surface: PBT
Max. operating temperature	T °C	-25 ... +70°C	-25 ... +70°C	-25 ... +70°C	-25 ... +70°C	-40 ... +85°C
Dimensions	mm	M12 x 45	M12 x 45	M12 x 60	M12 x 44	M12 x 43
Length	L mm	45	45	60	44	44
Connector		M12x1	M12x1	M12x1	M8x1	M8x1
Additional information						
Rated switching distance	S _N mm	8	4	8	4	2
Switching frequency	Hz	500	300	1000	800	2500
Operating current	mA	200	200	200	200	200
Mechanical installation		Not flush	Flush	Not flush	Not flush	Flush
Function indicator		LED	LED	LED	LED	LED
Switching output		PNP	PNP	PNP	PNP	PNP
Switching function		Normally open (NO)	Normally open (NO)	Normally open (NO)	Normally open (NO)	Normally open (NO)
Operating voltage	V DC	10 ... 30	10 ... 30	10 ... 30	10 ... 30	10 ... 30
Approvals		cULus, CE, EAC	cULus, CE, EAC	cULus, CE, EAC	cULus, CE, EAC	cULus, CE, EAC
Conformity with standards		IEC 60947-5-2	IEC 60947-5-2	IEC 60947-5-2	IEC 60947-5-2	IEC 60947-5-2

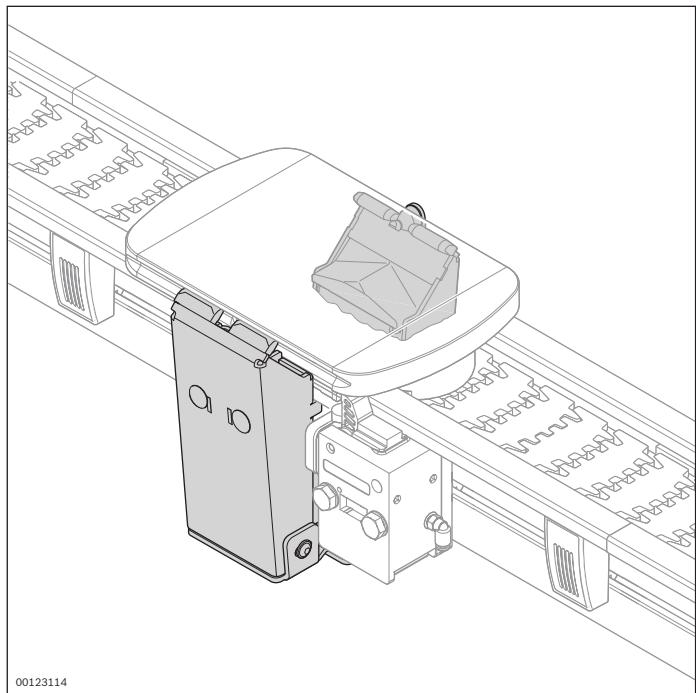
M12x1



M8x1



Positioning unit PE-VF/H



The plier-shaped form of the positioning unit (PE) makes it highly resistant to dirt and shavings and thus suitable for dirty environments. The WT is lifted approx. 1 mm above the transport level, thus eliminating the load on the conveyor chain during processing.

- Positioning accuracy in the direction of transport: ± 0.15 mm
- Maximum vertical press force ($p = 4$ bar): 400 N
- Maximum retention force ($p = 4$ bar) in the direction of transport: 300 N
- Suitable for retrofitting without disrupting the lateral guide
- The switch bracket can be installed in any position
- Minimum length of the workpiece pallets in order to incorporate the positioning unit:
Size 65: L = 125 mm
Size 90: L = 125 mm
- Two positioning units can be combined for workpiece pallets with $L > 250$ mm. For this, the positioning mandrel is removed from one of the PEs and the workpiece pallets are fitted with eccentric centering bushings by the customer
- Position inquiry with assembly kit and 2 M12x1 proximity switches on the housing (proximity switches not in the scope of delivery) or with **3 842 535 150** on the cylinder
- Max. torque in the pliers area: 60 Nm
- Required compressed air connection: 4 ... 6 bar

Required accessories:

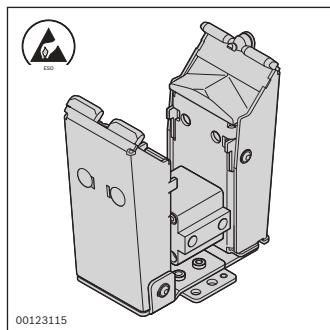
- 2 G 1/8" throttle check valves (not included in the scope of delivery)

Scope of delivery:

- Incl. fastening parts (as shown)

Material:

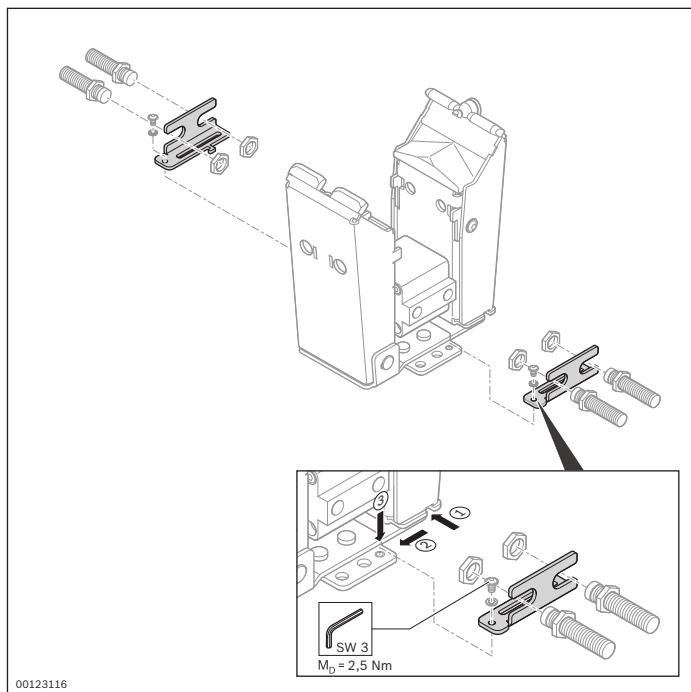
- Positioning unit: stainless steel
- Fastening parts: Steel, galvanized
- Cover caps: PA
- Clamping claws: PU



Positioning unit

No.

3 842 532 762

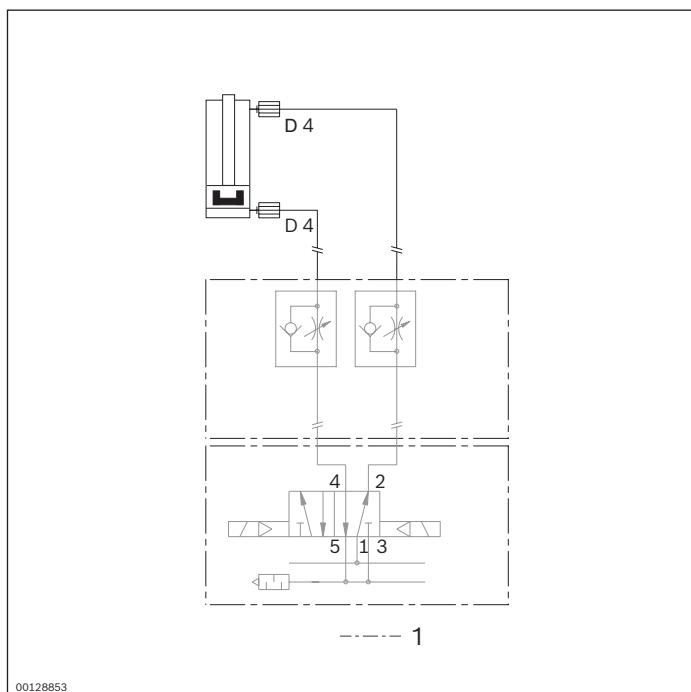


Position sensor kit

No.

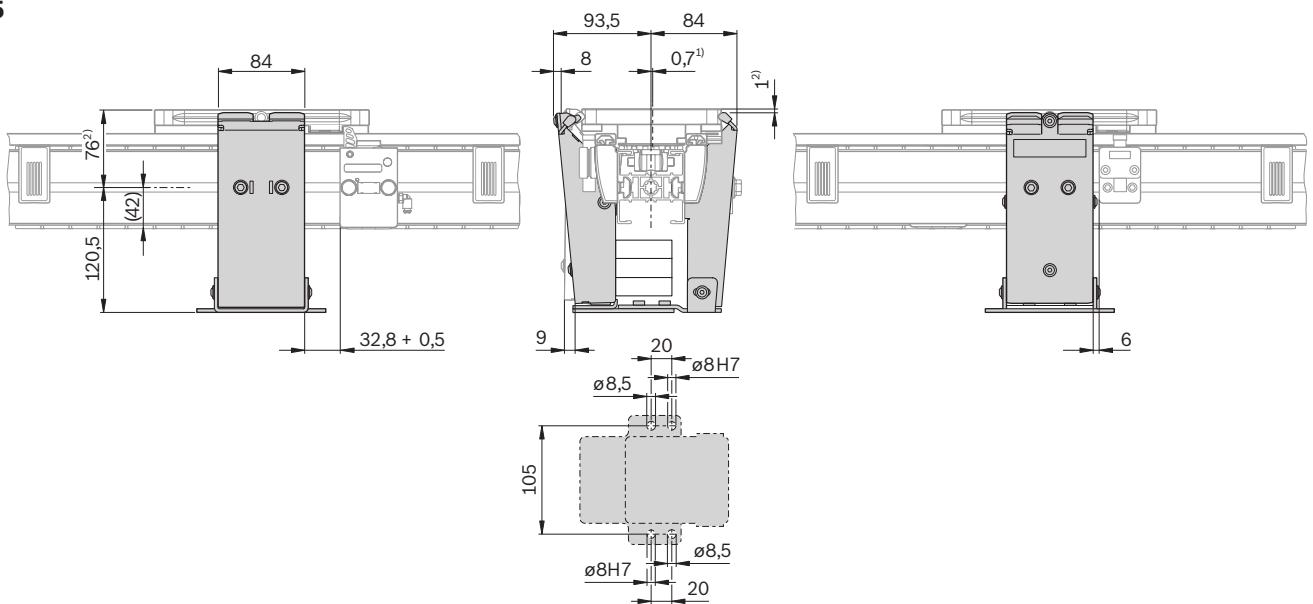
3 842 535 801

8

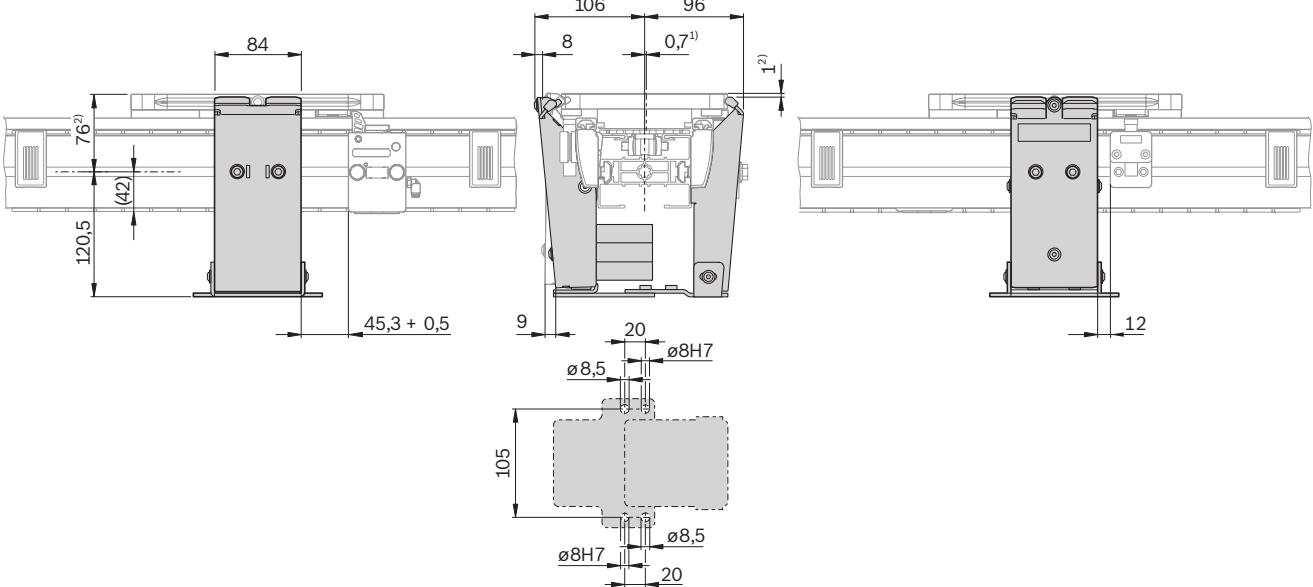


Circuit diagram

VF 65



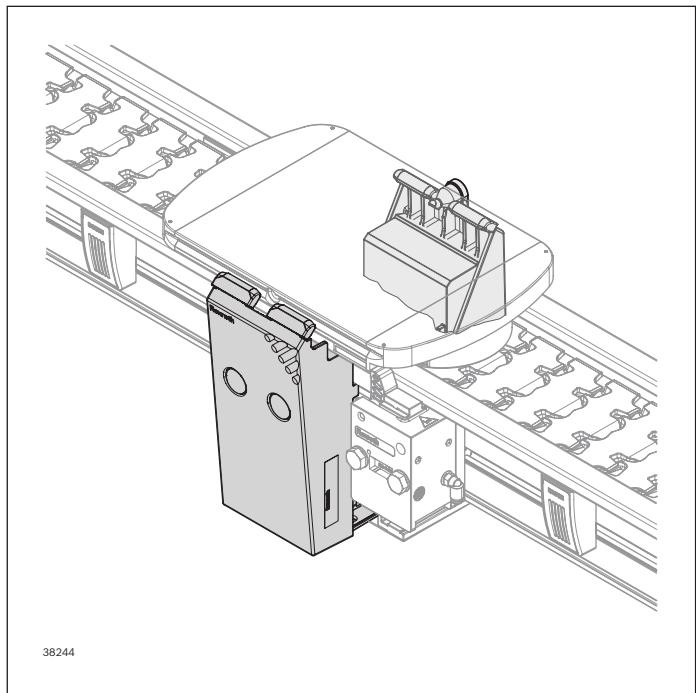
VF 90



¹⁾ Center offset of the workpiece pallet when it is positioned

²⁾ Height offset of the workpiece pallet when it is positioned

Position unit PE-VF/C



Required accessories:

- 2x throttle check valve G 1/8"
- Position sensor:
 - 2x sensor M12x45, 3 842 557 633
 - 1x switch bracket SH 2/HQ-R, 3 842 557 606
 - 1x switch bracket SH 2/HQ-L, 3 842 557 607

Scope of delivery:

- Incl. fastening parts (as shown)

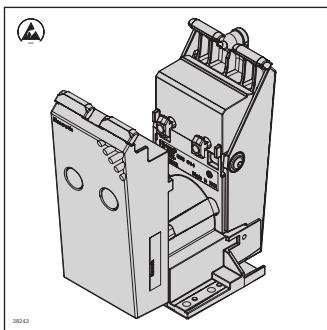
Material:

- Positioning unit: Diecast aluminum
- Fastening parts: Steel, galvanized
- Cover caps: PA
- Clamping claws: PU

The positioning unit PE-VF/C is intended for use in clean ambient conditions. The WT is lifted approx. 1 mm above the transport level, thus eliminating the load on the conveyor chain during processing.

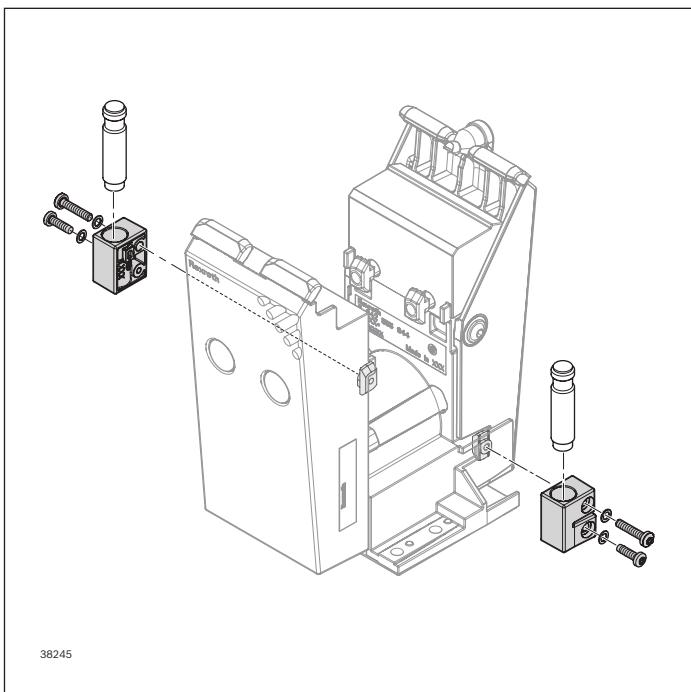
For rough ambient conditions, the positioning unit PE-VF/H is available.

- Positioning accuracy in the direction of transport: ± 0.15 mm
- Maximum vertical press force ($p = 4$ bar): 400 N
- Maximum retention force ($p = 4$ bar) in the direction of transport: 300 N
- Maximum permissible torque in the plier area: 60 Nm
- Suitable for retrofitting without disrupting the lateral guide
- The switch bracket can be installed in any position
- Minimum length of the workpiece pallets in order to incorporate the positioning unit:
 - Size 65: L = 125 mm
 - Size 90: L = 125 mm
- 2 positioning units can be combined for workpiece pallets with L > 250 mm. For this, the positioning mandrel is removed from one of the PEs and the workpiece pallets are fitted with eccentric centering bushings by the customer
- Position sensors (parts not included in the scope of delivery) with 2x sensor M12x45 (3 842 557 633) and 1x switch bracket each SH 2/HQ-R (3 842 557 606) and SH 2/HQ-L (3 842 557 607)
- Required compressed air connection: 4 ... 6 bar

**Positioning unit****No.**

PE-VF/C

3 842 557 090

**Position sensor****No.**

Sensor M12x45

3 842 557 633

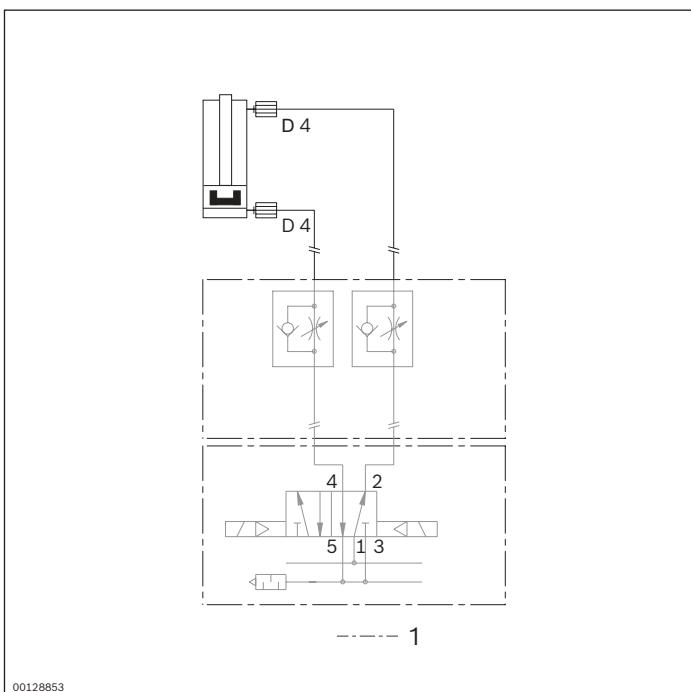
SH 2/HQ-R switch bracket

3 842 557 606

SH 2/HQ-L switch bracket

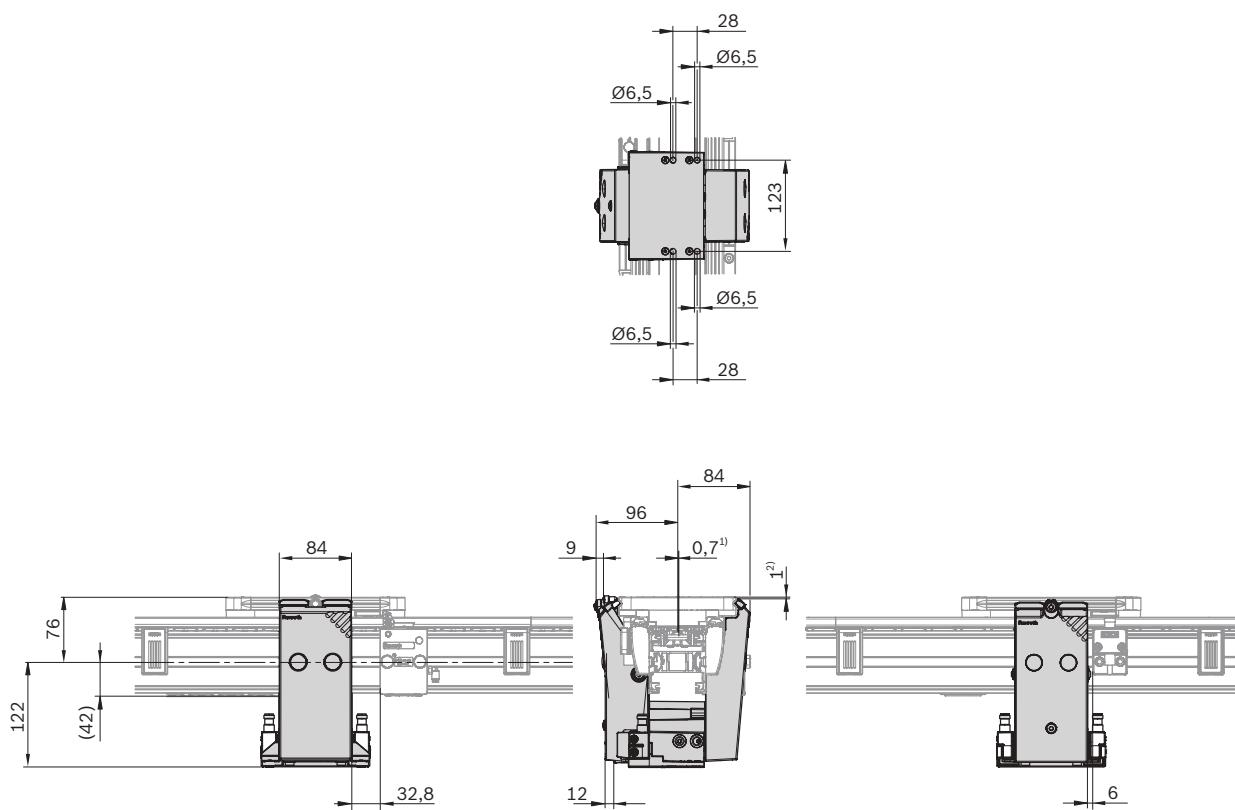
3 842 557 607

8

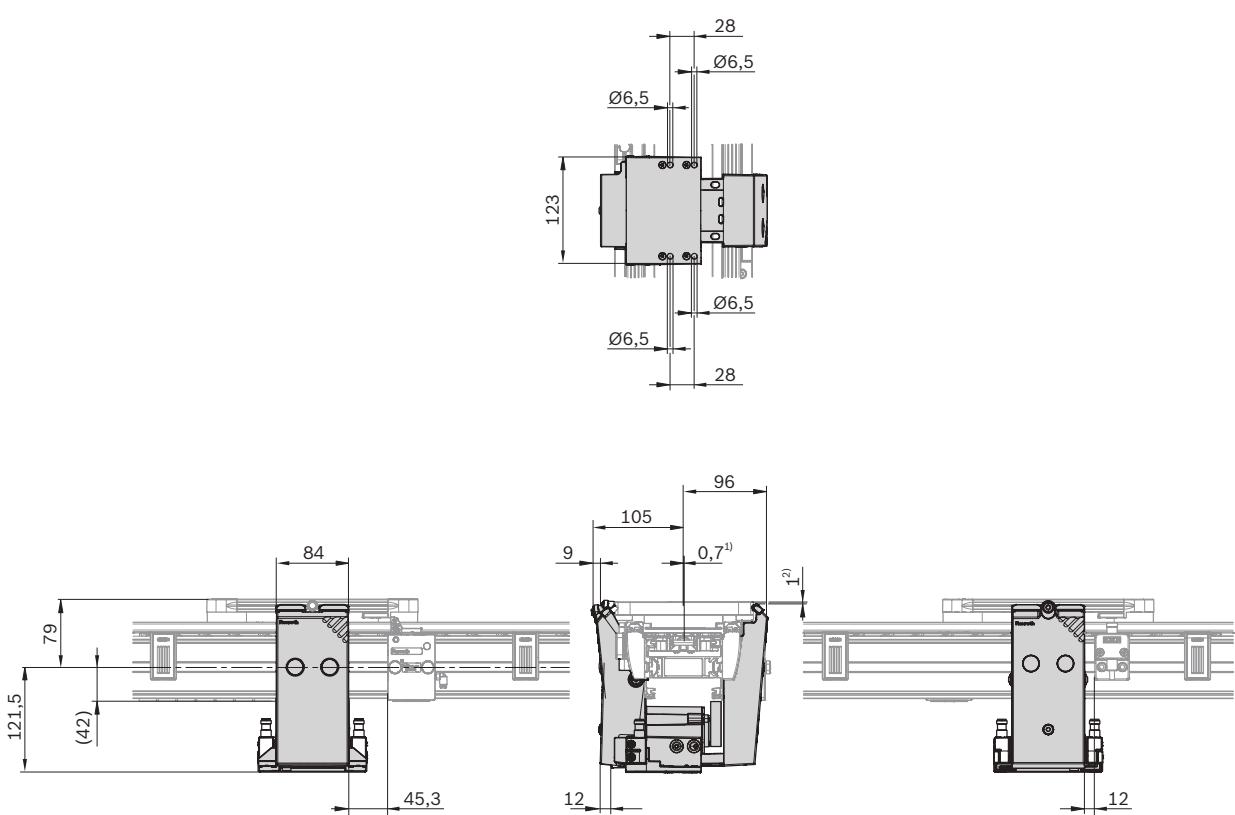
**Circuit diagram**

1 Not included in the scope of delivery

VF 65



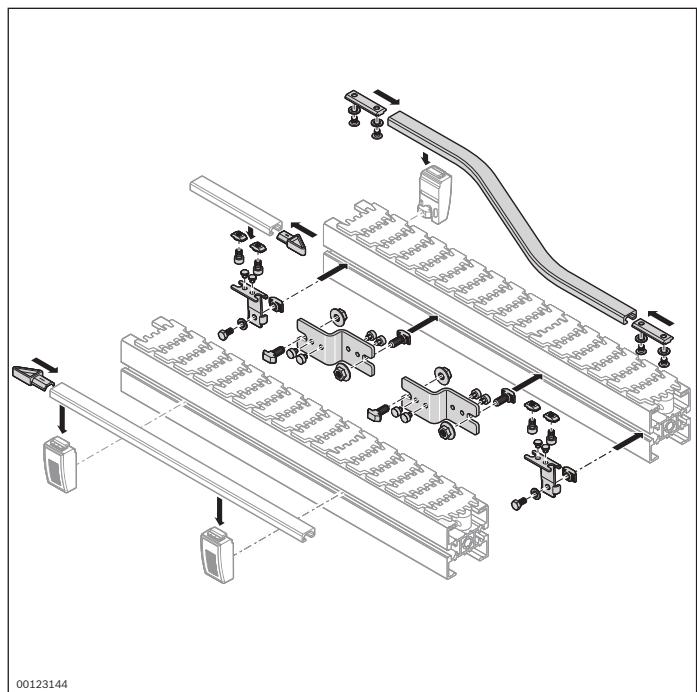
VF 90



¹⁾ Center offset of the workpiece pallet when it is positioned

²⁾ Height offset of the workpiece pallet when it is positioned

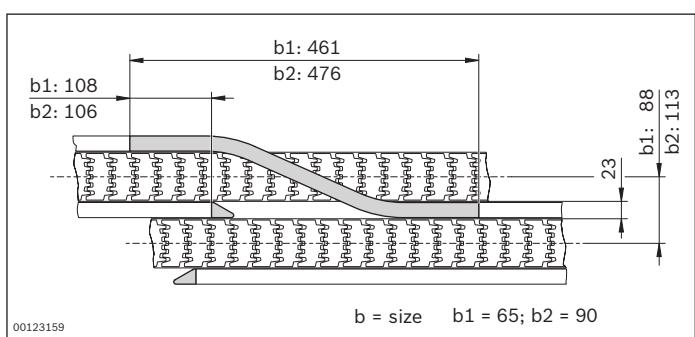
Section transfer

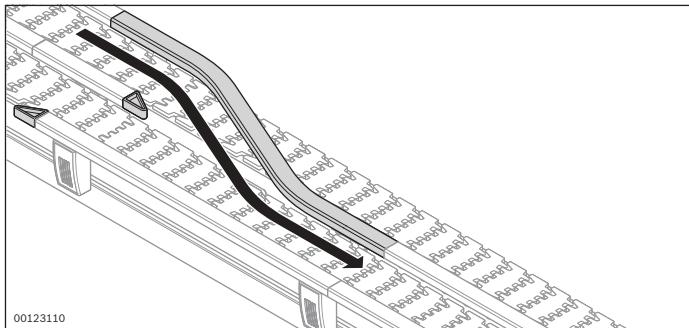


Assembly kit for a simple track change between two straight, parallel conveyor sections

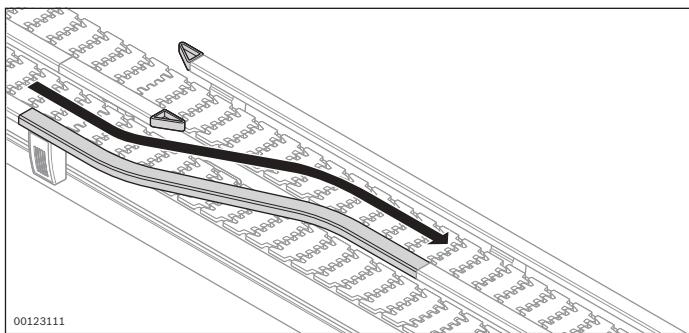
Material:

- Guide rail: Aluminum; natural, anodized
- Section link, holder: stainless steel
- Fastening parts: Steel; zinc-plated
- End caps: PA; black



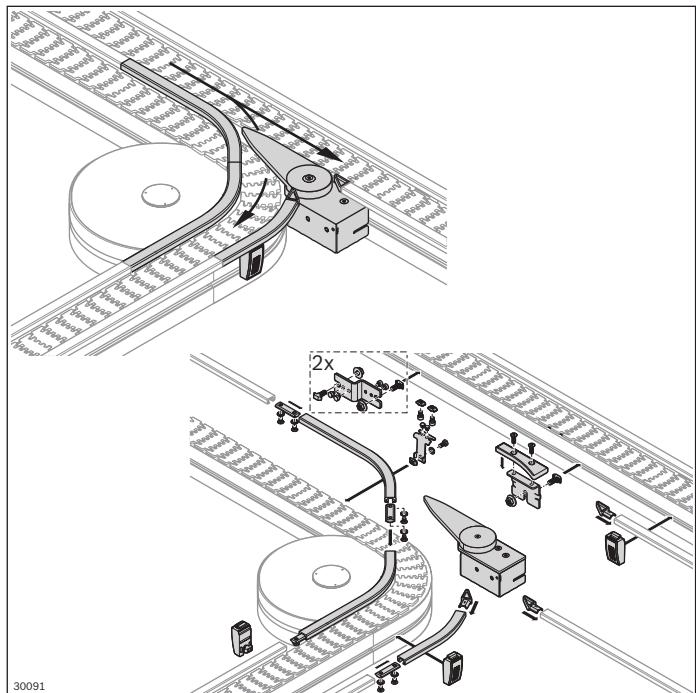
**Section transfer, right****No.**

VFplus 65	3 842 535 003
VFplus 90	3 842 535 001

**Section transfer, left****No.**

VFplus 65	3 842 535 004
VFplus 90	3 842 535 002

Diverter



For optionally changing tracks between different, curving conveyor sections

- Complete assembly kit to install on existing sections or curve wheels
- The support enables the workpiece pallet to move safely over the section gap with no danger of tipping. No accumulation operation against the diverter blade!
- Required compressed air connection: 4 ... 6 bar

Required accessories:

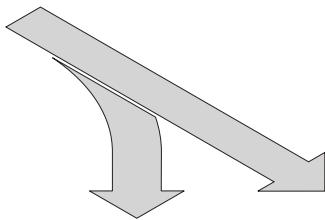
- 2 G 1/8" throttle check valves (not included in the scope of delivery)

Scope of delivery:

- Kit incl. fastening parts (as shown)

Material:

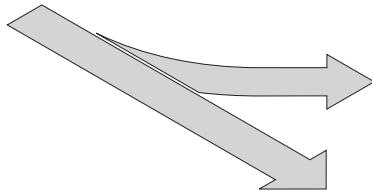
- Diverter blade, sliding surface support: PA; black



00123097

45° diverter, right**No.**

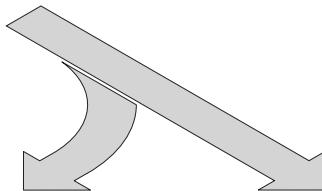
VFplus 65	3 842 551 104
VFplus 90	3 842 551 090



00123098

45° diverter, left**No.**

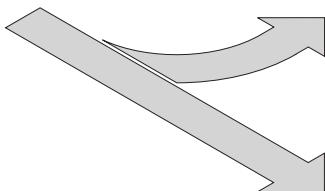
VFplus 65	3 842 551 105
VFplus 90	3 842 551 091



00123099

90° switchpoint, right**No.**

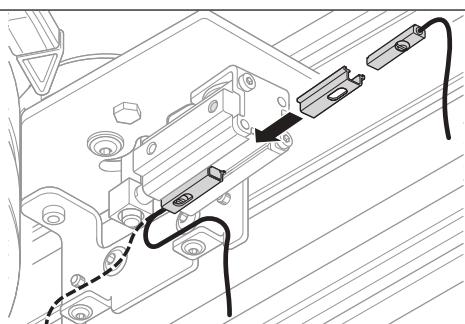
VFplus 65	3 842 551 111
VFplus 90	3 842 551 110



00123100

90° switchpoint, left**No.**

VFplus 65	3 842 551 121
VFplus 90	3 842 551 100

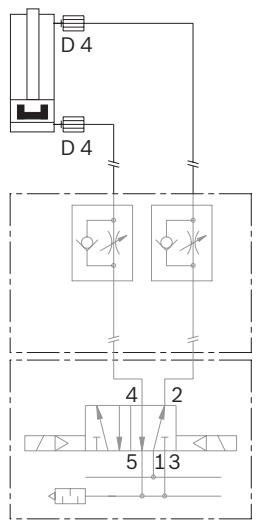


00123102

Position sensor diverter**No.**

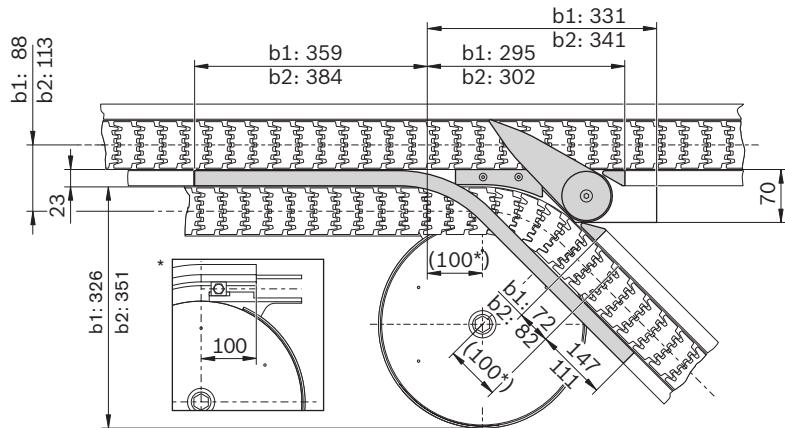
3 842 535 150

Circuit diagram

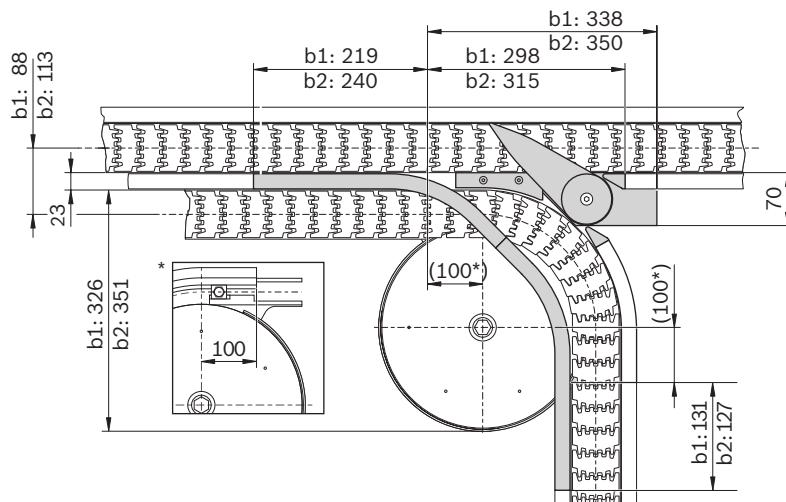


00128853

1 Not included in the scope of delivery



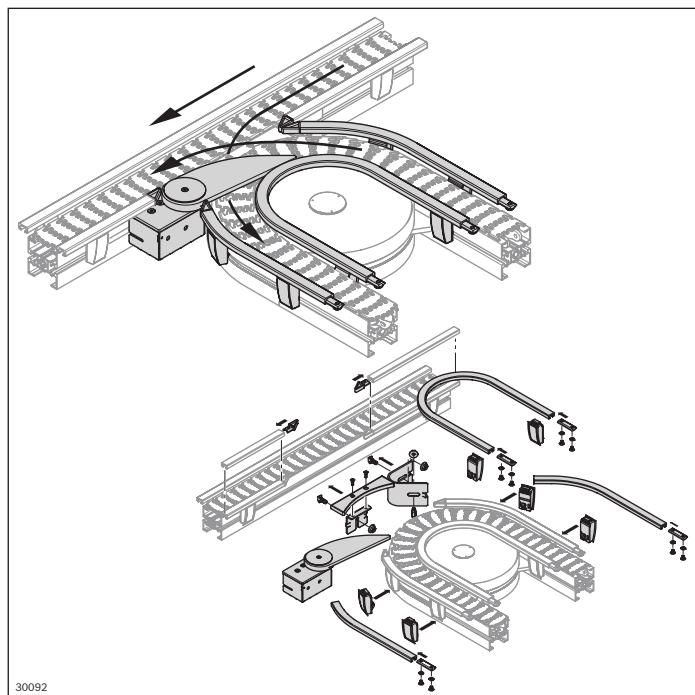
00123157



00123911

b = size
 b1 = 65; b2 = 90

Cross-diverter



The cross-diverter combines the functions of junction and diverter in a shorter overall length.

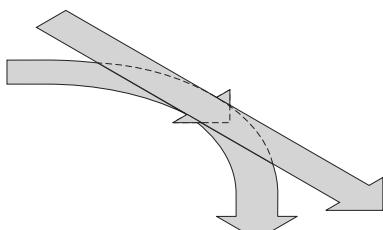
- Complete assembly kit to install on existing sections or curve wheels
- For problem-free section transfer, the load center of gravity must be in the center of the optimal range (see p. 250)
- Permissible speed range:
min. 4 m/min, max. 18 m/min
- The support enables the workpiece pallet to move safely over the section gap with no danger of tipping.
No accumulation operation against the diverter blade!
- Required compressed air connection: 4 ... 6 bar

Scope of delivery:

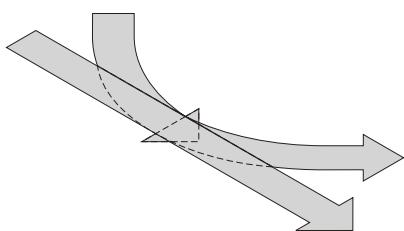
- Kit incl. fastening parts (as shown)

Material:

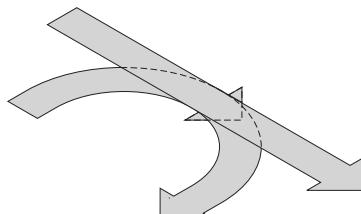
- Diverter blade, sliding surface support: PA; black



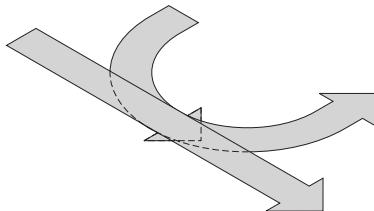
00123887

45° cross-diverter, right**No.**VFplus 65 **3 842 551 086**VFplus 90 **3 842 551 084**

00123888

45° cross-diverter, left**No.**VFplus 65 **3 842 551 140**VFplus 90 **3 842 551 139**

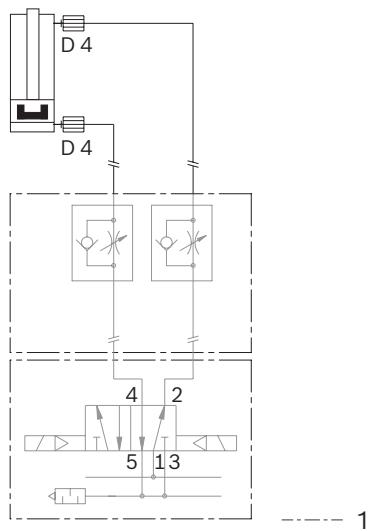
00123889

90° cross-diverter, right**No.**VFplus 65 **3 842 551 108**VFplus 90 **3 842 551 074**

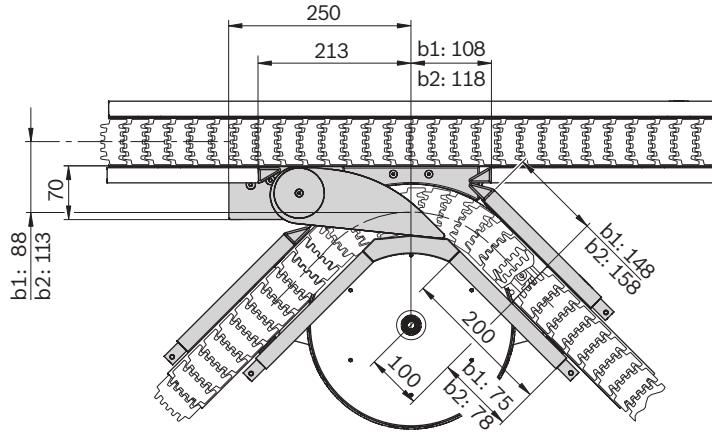
00123890

90° cross-diverter, left**No.**VFplus 65 **3 842 551 141**VFplus 90 **3 842 551 138**

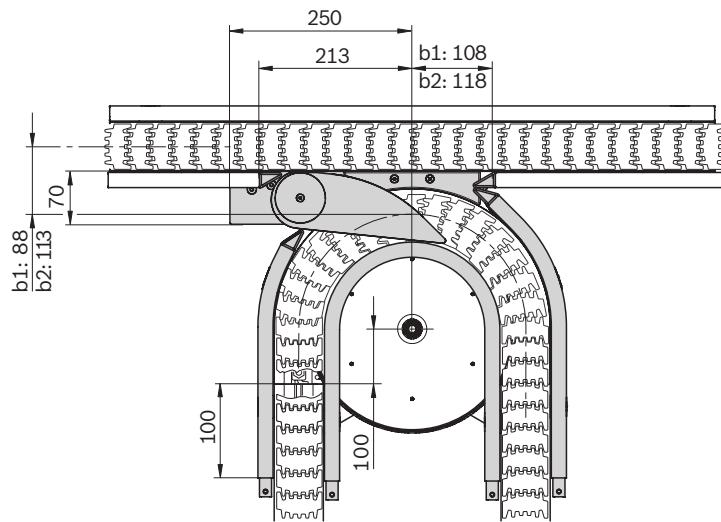
Circuit diagram



1 Not included in the scope of delivery



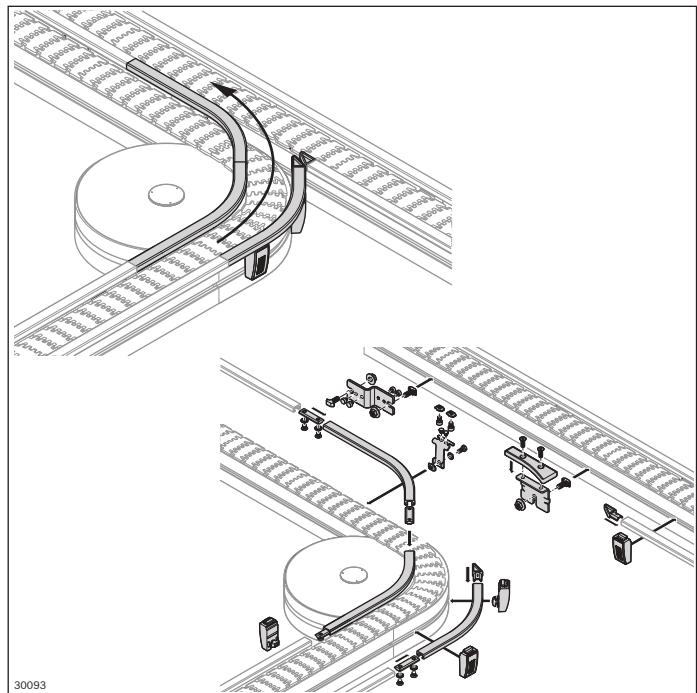
00134820



00134821

b = size
b1 = 65; b2 = 90

Junction



Used for the junction of different, curving conveyor sections

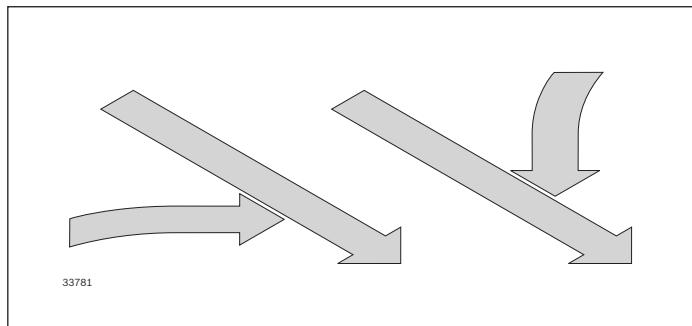
- Complete assembly kit to install on existing sections or curve wheels
- The support enables the workpiece pallet to move over the section gap with no danger of tipping
- Required compressed air connection: 4 ... 6 bar

Scope of delivery:

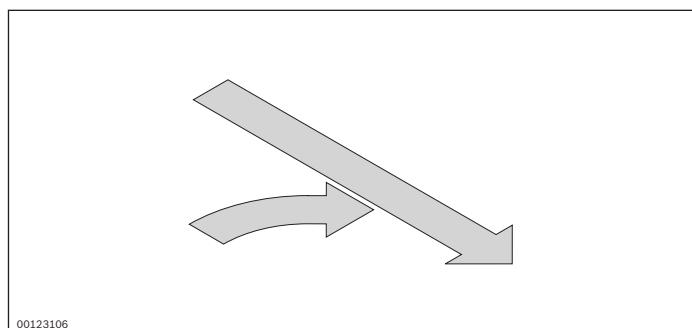
- Kit incl. fastening parts (as shown)

Material:

- Sliding surface support: PA; black

**45° junction, right/left****No.**

VFplus 65/90

3 842 551 122**90° junction, right****No.**

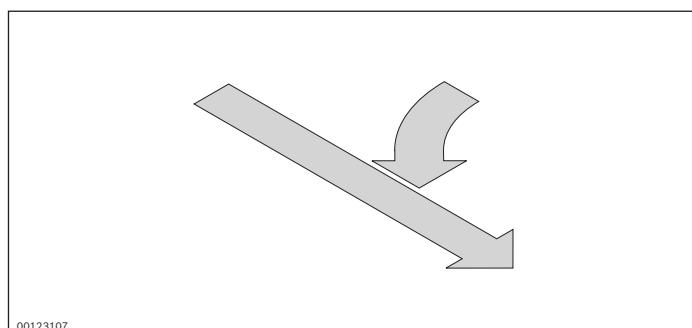
VFplus 65

3 842 551 128

VFplus 90

3 842 551 125

8

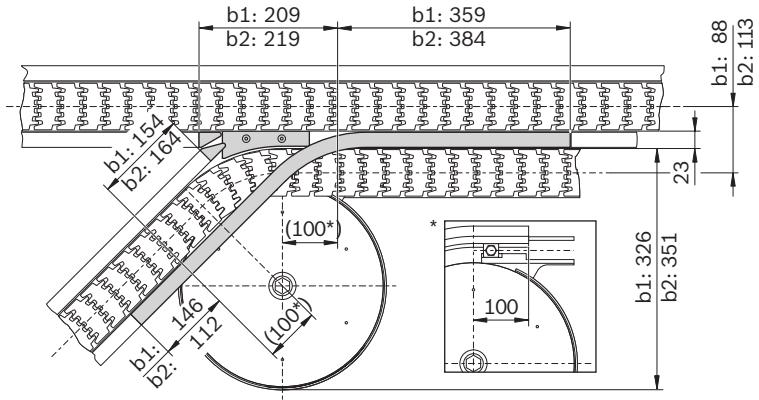
**90° junction, left****No.**

VFplus 65

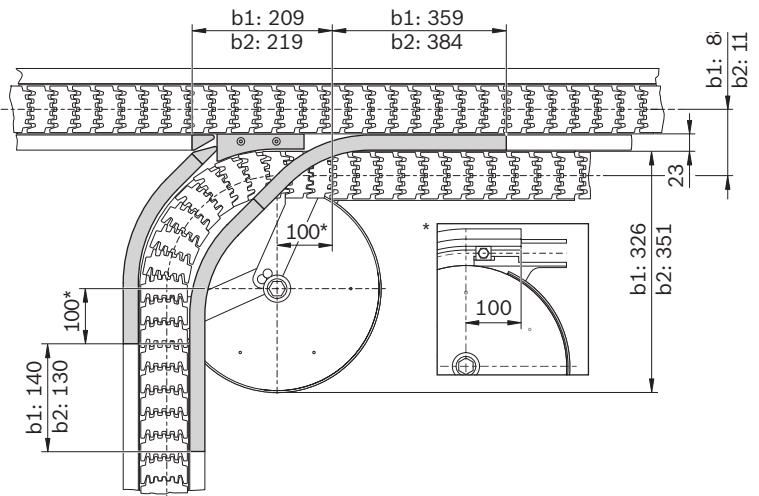
3 842 551 137

VFplus 90

3 842 551 124



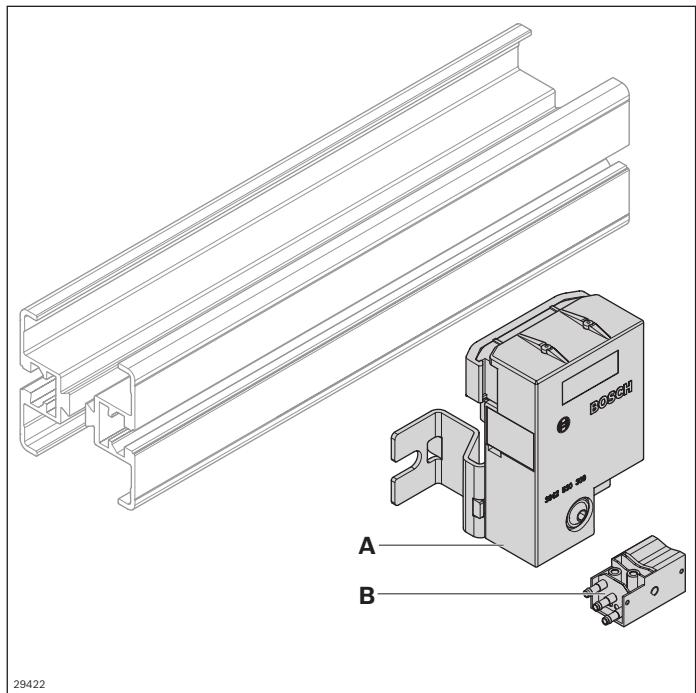
00123158



00134912

b = size;
b1 = 65; b2 = 90

Rocker WT system



The rocker can be used for area monitoring, accumulation pressure regulation, and workpiece pallet recognition. A query can be either made electrically with a proximity switch or pneumatically to directly convert the shutter actuation into a pneumatic signal. Simple, purely pneumatic accumulation pressure regulation can be established in conjunction with a stop gate VE 2/VF.

- Monitoring range: 60 mm
- Required compressed air connection: 4 ... 6 bar

- ▶ The rocker does not protrude beyond the top edge of the workpiece pallet
- ▶ A sideways query on the workpiece pallet plate ensures the lateral guide profiles are not interrupted

Accessories:

- Pneumatic cylinder switch (B) (3 842 532 151)
- 12 mm proximity switch, round with switching distance $S_N > 4$ mm

Scope of delivery:

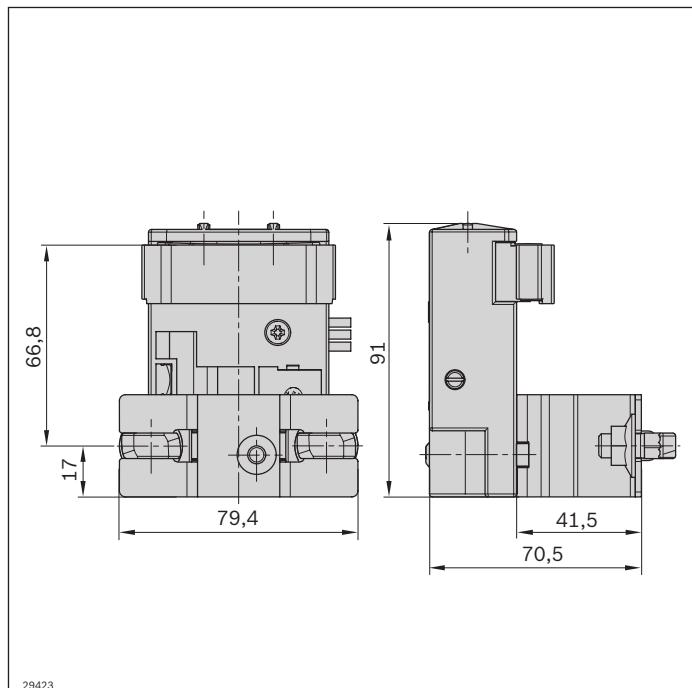
- Set incl. fastening material

Material:

- Non-rusting steel 1.4301, PA

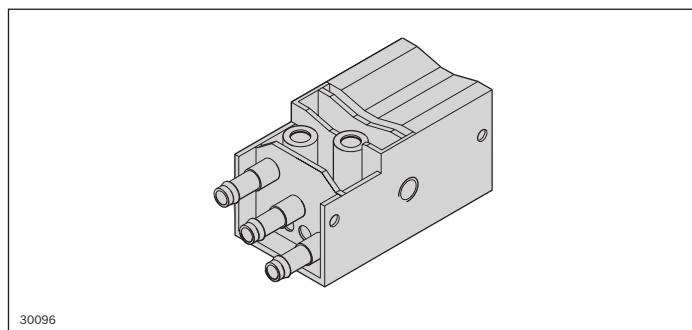
Condition on delivery:

- Some assembly required

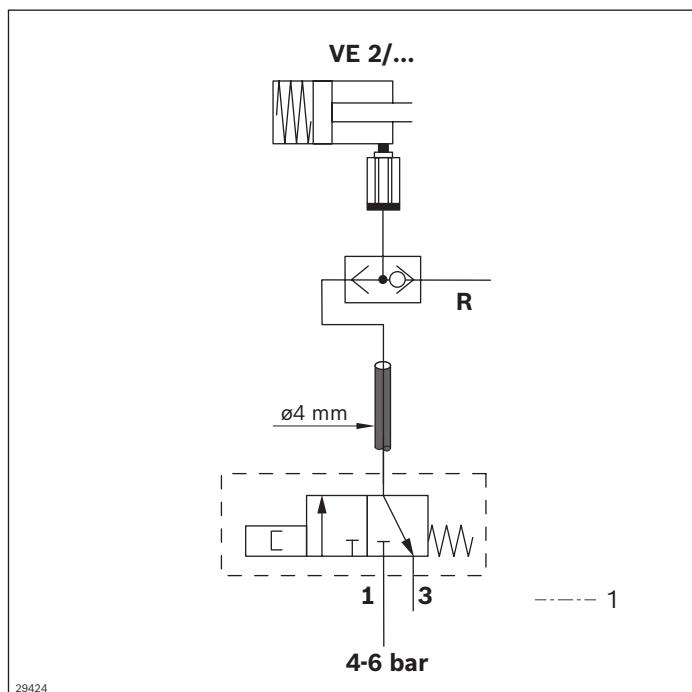


Rocker	No.
A 1 pc	3 842 547 464

8

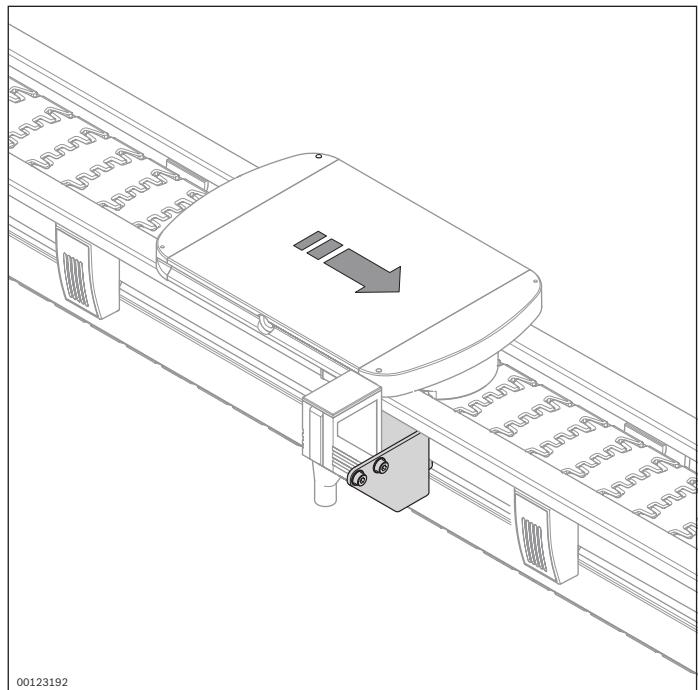


Pneumatic cylinder switch	No.
B 1 pc	3 842 532 151



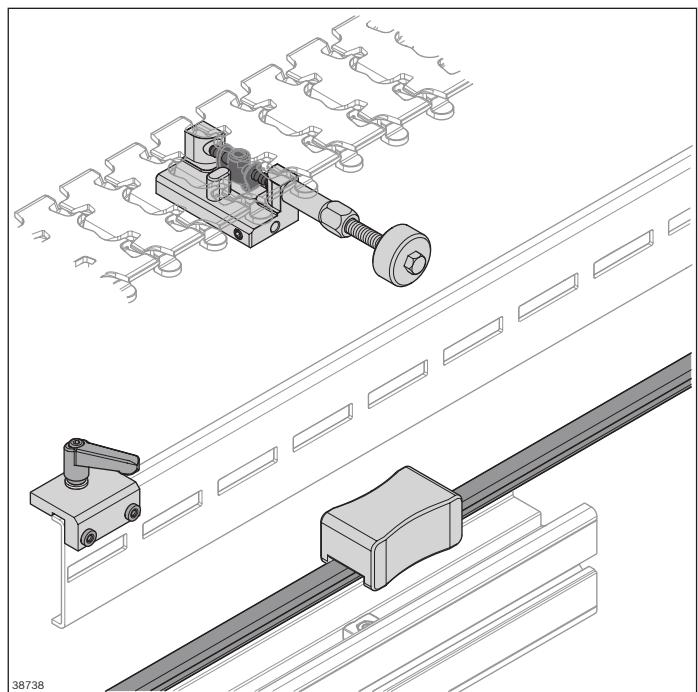
Circuit diagram

Identification systems ID 15 and ID 200



Assembly kits and mobile data tags for identification systems ID 15 and ID 200 for use in VarioFlow *plus* systems can be found in the RFID systems catalog (3 842 541 003).

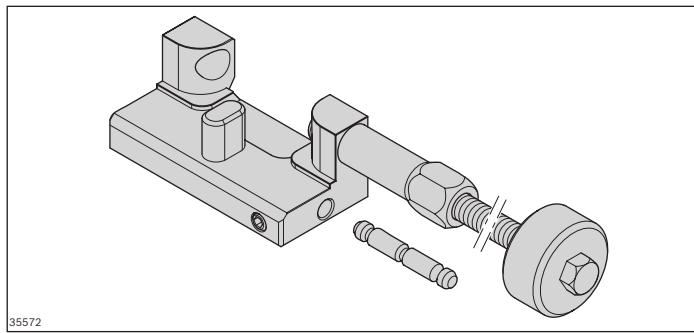
Tools



Convenient assembly with the appropriate tool

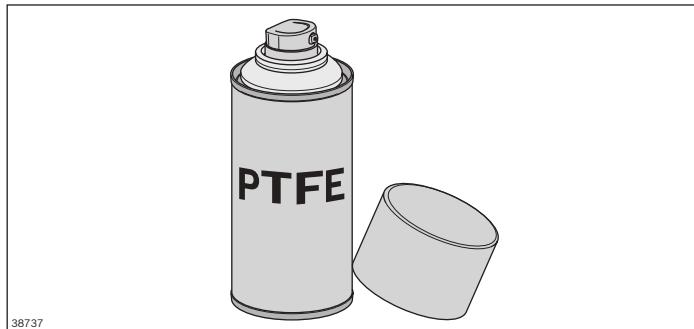
	Chain assembly tool	300
	PTFE spray	300
	Sliding rail assembly tool	300
	Drilling jig	301
	Miter cutter	301
	Safety coupling tool	301
	Bending tool for lateral guide	302

Tools



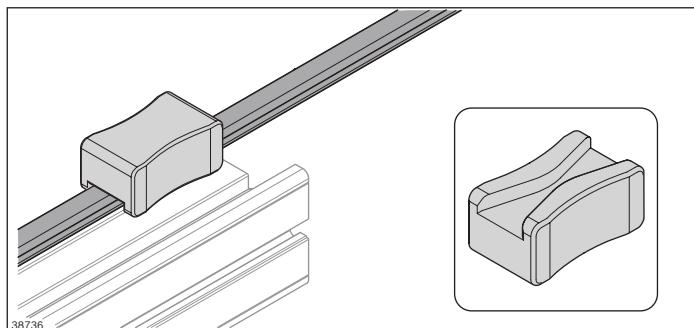
- ▶ Very compact assembly tool for use in constricted spaces to insert and remove the chain pin
- ▶ Simple overhead two-hand assembly is also always guaranteed
- ▶ A hexagon on the spindle makes it possible to use a cordless nutrunner as drive

Chain assembly tool	No.
Size 65-120	3 842 557 025
Size 160-320 t7	3 842 571 259



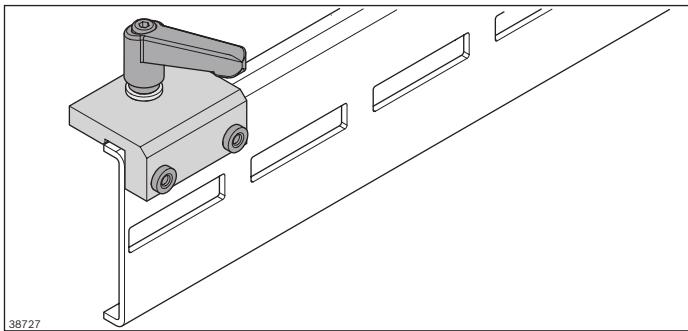
- ▶ PTFE spray for reducing friction and noise emission

PTFE spray	No.
	3 842 546 150



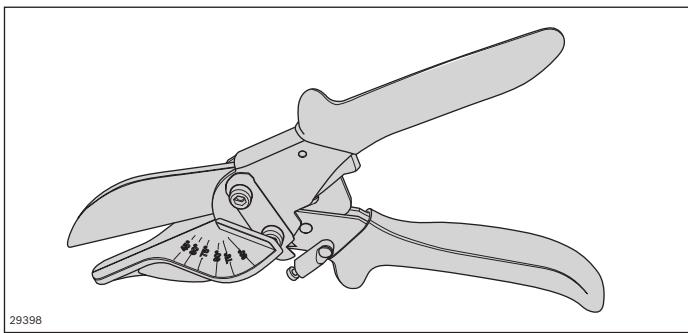
- ▶ Assembly tool to easily and effortlessly clip the sliding rail onto the section profile

Sliding rail assembly tool	No.
	3 842 549 738



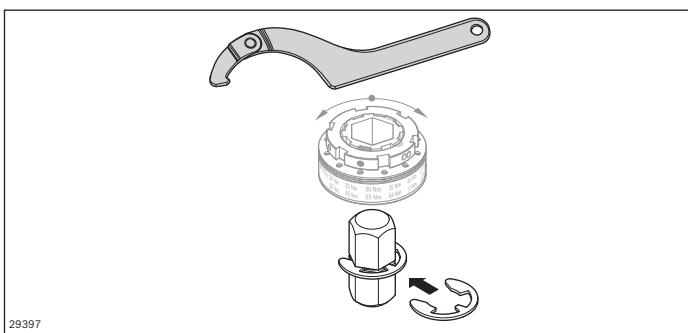
- ▶ The drilling jig can be right or left-justified and is used to drill an accurately positioned hole to secure the sliding rail both on the section profile as well as on the support profile

Drilling jig	No.
	3 842 553 518



- ▶ The sliding rail can be easily and quickly cut to the correct length and angle with the miter cutter

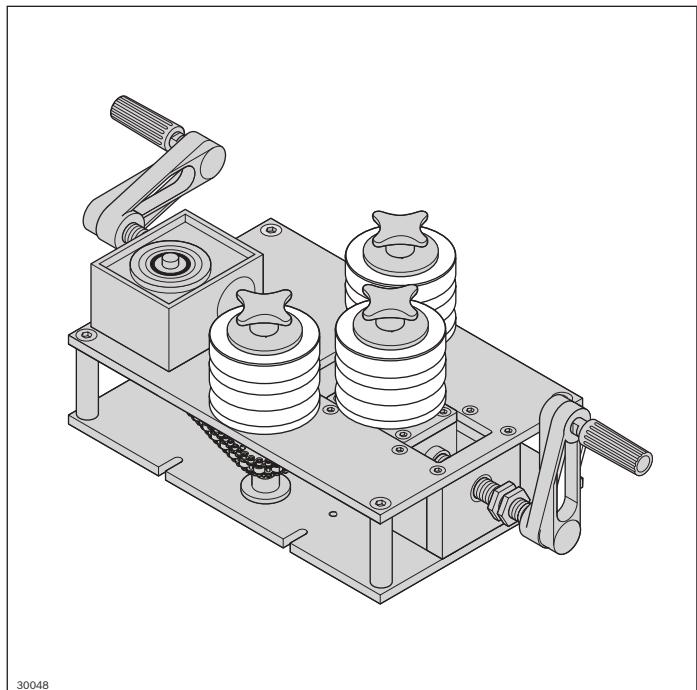
Miter cutter	No.
	3 842 547 982



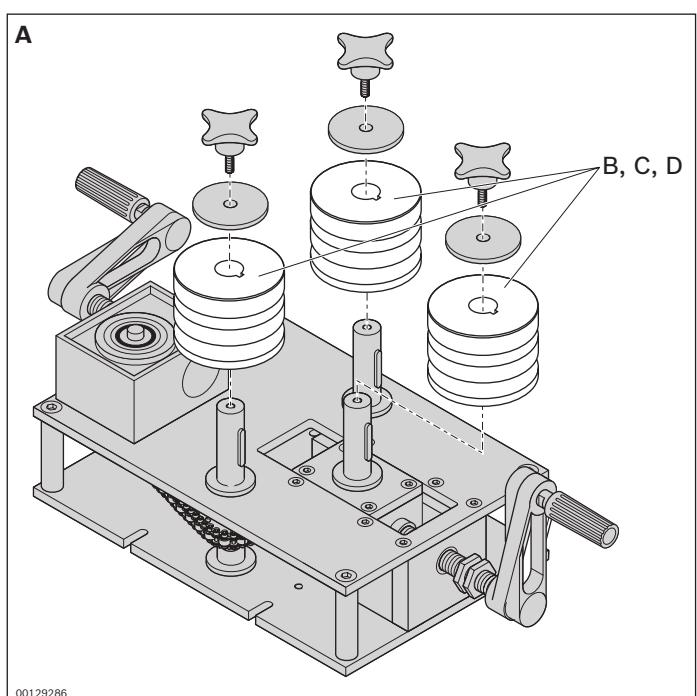
- ▶ Tool for setting the customer-specific torque of the optionally available safety coupling of the drive kit

Safety coupling tool	No.
	3 842 549 388

Bending tool for lateral guide



Crank-operated bending tool (A, without roller set) for bending profiles. Roller set adjusted to fit the profile rail to laterally guide the transported material. We recommend that you let your Bosch Rexroth distribution partner carry out the bending of lateral guides.



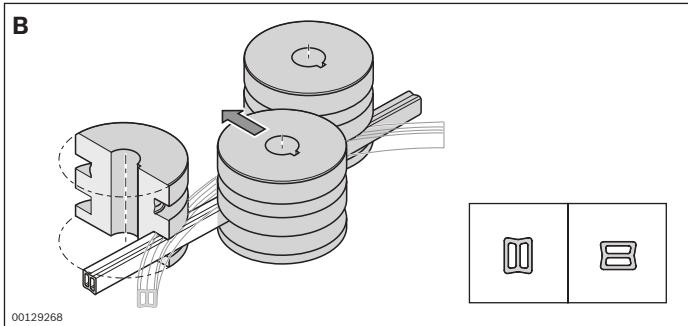
Bending tool for lateral guide



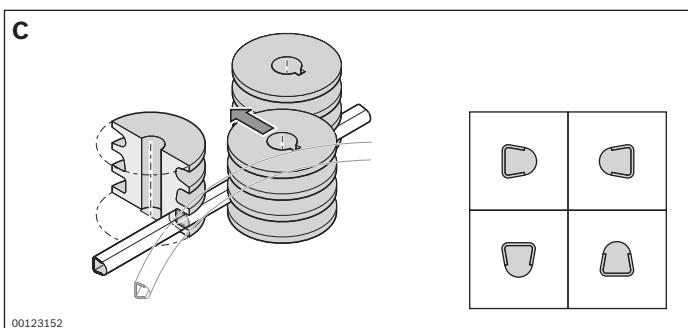
No.

A

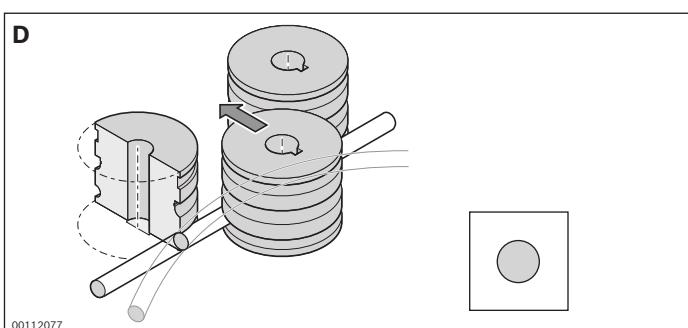
1 3 842 528 531



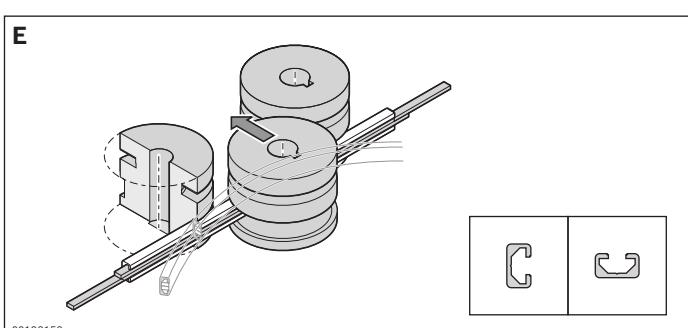
Roller set	No.
B	1 3 842 538 773



Roller set	No.
C	1 3 842 529 236

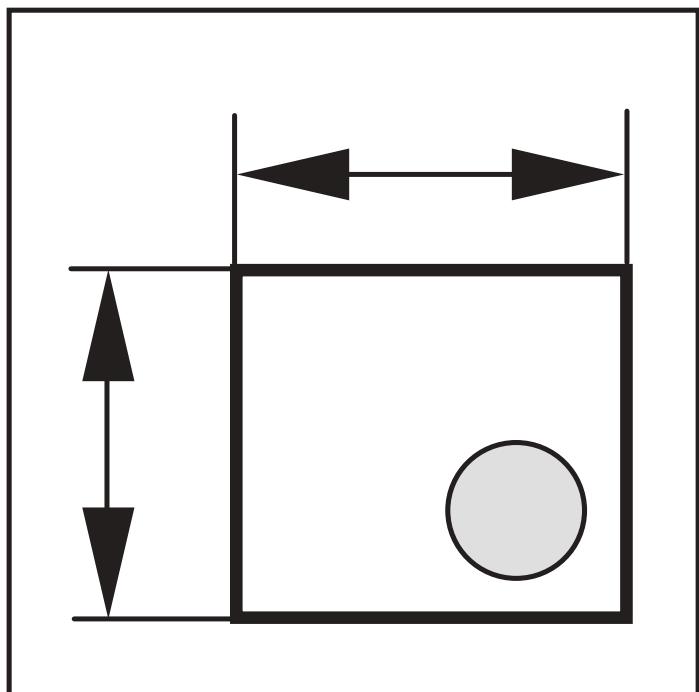


Roller set	No.
D	1 3 842 533 921



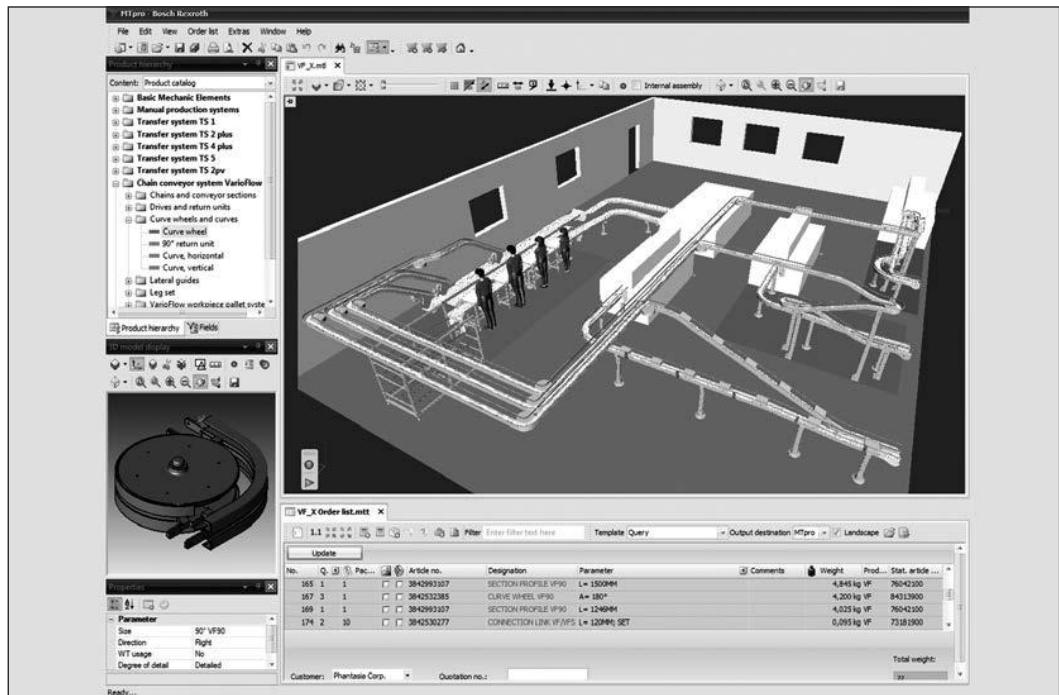
Roller set	No.
E	1 3 842 532 259

Technical data



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Calculation of chain tensile forces



The tensile force of the conveyor chain is made up of multiple individual forces:

- Sliding friction force between unloaded chain and sliding rail
- Sliding friction force between loaded chain and sliding rail
- Sliding friction force between accumulated goods and chain

- Tangential components of the goods' and chain's force due to weight in inclining sections
- Sliding friction force in curves, between the chain and the inner sliding rail in the curve

The BKBsoft calculation software, included in the MTpro planning tool, assists you when designing and making the necessary calculations for your VarioFlow chain conveyor system.

MTpro with BKBsoft – the software for chain calculation

With the BKBsoft software you can calculate the maximum chain tensile force and the required drive torque quickly and efficiently.

Layout procedure for a chain conveyor system

Task definition:

Determine number and position of the work steps, calculate the available space



Plan rough system layout:

Lengths, segments, curves, slopes (sketch)



Product-specific data:

Determine the data for the conveyed material: Dimensions, mass, friction coefficients, anti-static environment needed?



Product-specific data:

Determine the transport parameters: Speed, distance and cycles of the conveyed material, number of start-up procedures/hour, accumulation sections



Detailed system layout planning: Accumulation sections, product transfer points see MTpro



Calculation of chain tensile force F with BKB in MTpro



$F < F_{\text{permissible}}$ (see p. 308):

yes

no ►

e.g. divide section



$F << F_{\text{permissible}}$ (oversized)

no

yes ►

Check drive torque:

$$\frac{M \times 2}{\varnothing T_k} \geq F$$

OK?

yes

no ►



$$F_{\text{permissible}} = F_{(a)} \cdot K_T \cdot c_B$$

$$\begin{aligned} F_{(v)} < F_{(L)} &\Rightarrow F_{(a)} = F_{(v)} \\ F_{(v)} > F_{(L)} &\Rightarrow F_{(a)} = F_{(L)} \end{aligned}$$

$F_{(v)}$, see p. 309

$F_{(L)}$, see p. 310

K_T , see p. 310

c_B , see p. 311

Calculating the permissible chain tensile force and the permissible drive torque

The permissible chain tensile force depends on the transport speed as well as the ambient and operating conditions.

If the calculated chain tensile force exceeds the permissible force, you can:

- divide the section into various chain conveyors.
- alter the system layout, e.g. by replacing curves with curve wheels or, if possible, shorten the section.
- shorten the accumulation sections.
- reduce the speed.

$$M = M_N \cdot \frac{P_v}{P_N}$$

M_N , see p. 318

$\frac{P_v}{P_N}$ see p. 317

The permissible drive torque of a gear motor is dependent on the transport speed (v), the operating mode (with/without FU), the ambient temperature and the line frequency.

If the necessary calculated drive torque is greater than that of the selected gear motor, you have the following options:

- reduce the chain tensile force (F).
- reduce the speed (v) and use a gear motor with a higher drive torque, see p. 316.
- change the operating conditions (e. g. the ambient temperature).

Conveyor chain

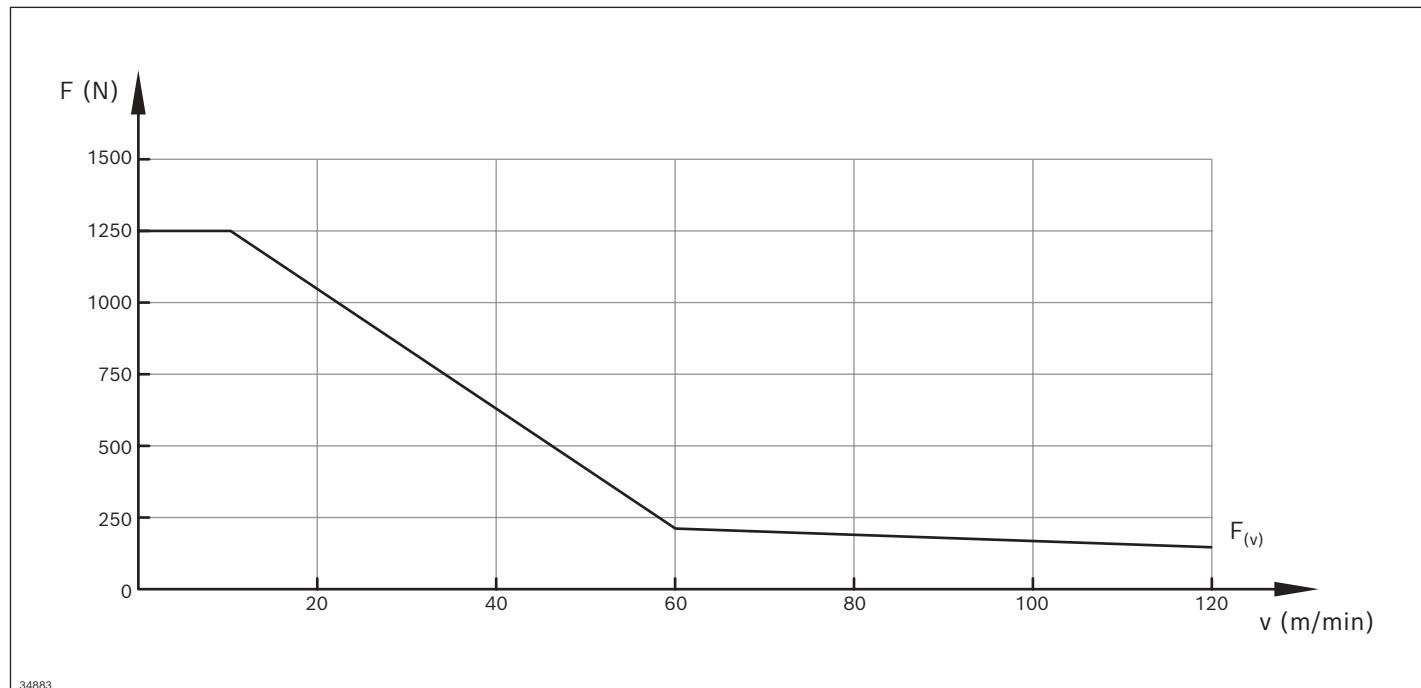
The technical data of the conveyor chain are included as basic data in the chain tensile force calculation.

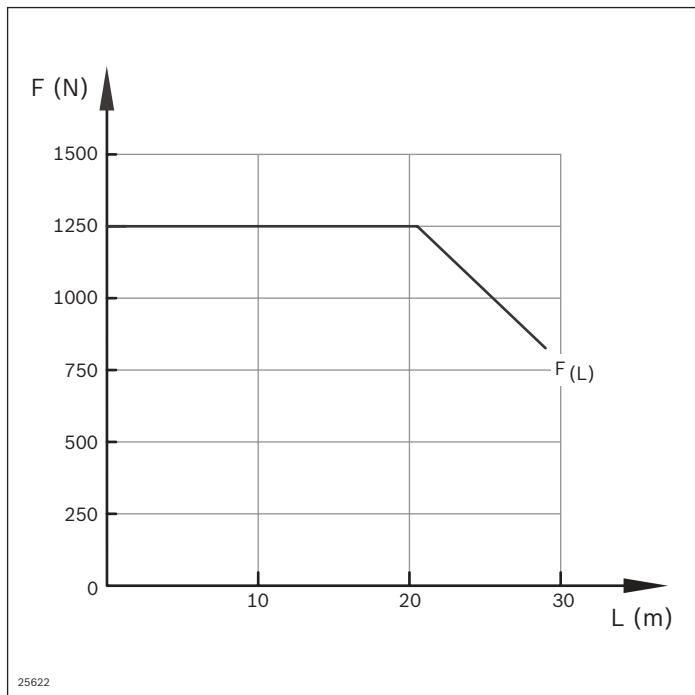
Please note that the fracture force values depend on the temperature, see p. 310

Permissible section load of the conveyed goods q_{Fi} :

30 N/chain link (34.5 mm)

	Conveyor chain section load (own weight N/m)						
	Flat conveyor chain	Static friction chain	Accumulation roller chain	Universal chain	Cleated chain	Wedge chain 3L	Wedge chain 5L
VFplus 65	9.5	10.0	16.0	9.5	10.0		
VFplus 90	11.7	12.4	20.5	11.7	12.4	25.3	27.6
VFplus 120	13.5	14.5	25.4	13.5			
VFplus 160	17.9	18.9					
VFplus 240	21.0	22.0					
VFplus 320	24.4	25.7					

Permissible chain tensile force depending on the speed F_v (N); max. 1250 N



Permissible chain tensile force depending on the length of the conveyor section; $F_{(L)}$ (N); max. 1250 N

Breaking force and chain elongation depending on the ambient temperature

The chain material (POM) displays viscoelastic behavior just as every polymer does. This elongates the chain during operation and it is necessary to regularly check the chain elongation and shorten the chain if needed.

A VarioFlow chain conveyor system can be operated without product accumulation and without curves in a temperature range from 0°C ... + 60°C. The influence of temperature needs to be taken into account in accumulation operation and for systems with curves.

Other temperatures available on request

Temperature T (°C)	Breaking force factor K_T	Chain elongation (%)
0	1.12	-0.2
20	1.00	0
40	0.96	0.2
60	0.94	0.5

Stick-slip effect

On conveyor systems with plastic chains, slipping known as the stick-slip effect (chain movement against the running direction) may occur in the rear transport area (before the return unit). This is the effect whereby sections of chain take on different running speeds in certain areas, ranging through to a brief standstill.

The effect is more pronounced the larger the distance from the drive. There is no stick-slip effect on the drive unit, as the chain is kept under optimal tension by the chain sprocket.

As a general rule, the stick-slip effect is mostly a visual and not a functional impediment for the continuous material flow. For certain applications, it is important to ensure that sections that may be susceptible to slipping are not used at points in the system with part positioning (e.g. printing).

Curve angles (horizontal/vertical)	Curve factor k_a
0 ° (section without curves)	1.0
Curve wheel 0 ° ... 180 °	1.0
5 °	1.05
7.5 °	1.05
15 °	1.1
30 °	1.2
45 °	1.3
60 °	1.4
90 °	1.6

Start-up procedures/h	Operating factor c_B
0 ... 1	1.0
2 ... 10	0.83
11 ... 30	0.71
> 30	0.62

Curve factor k_a

Additional sliding friction forces occur in curves.

They depend on the curve angle and are included in the required chain tensile force calculation via the curve factor.

Operating factor c_B

The permissible chain tensile force depends on the number of start-up procedures per time unit.

Clocked operation leads to increased chain stress.

The application factor is reduced when using a motor control such as a frequency converter. Intermediate values should be interpolated.

Sliding rail selection

Sliding rail	Basic	Advanced	Premium	ESD	Steel ²⁾
Range of application					
v _{max} (m/min)	60	60	120	30	60
Size 65-120	✓	✓	✓	✓ ¹⁾	✓
Size 160-320	✗	✓	✓	✗	✗
Sliding curves horizontal/vertical	✗	✓	✓	✗	✗
Clean room use	✗	✗	✓	✗	✗

¹⁾ Only size 65, 90

²⁾ When used in curve wheels, the steel sliding rail curve wheel is to be used in the upper branch (Basic, Advanced or Premium must be used in the lower branch)

Condition of contact surfaces	Basic	Advanced	Premium	ESD	Steel
1	0.20	0.15	0.15	0.25	0.26
2	0.25	0.20	0.20	—	0.26
3	>0.25	>0.20	>0.20	—	>0.26

1 Dry, clean =

- * No build-up of particles
- * Regular cleaning ≤ 1 x/week

2 Remove built-up particles and non-abrasive liquids occasionally, depending on degree of contamination

3 Constant exposure to particles and liquids, but no abrasive media

Please contact www.boschrexroth.com.

Notice: We recommend using a homogeneous sliding rail variant throughout the entire section, i.e. no mixing of Basic, Advanced, Premium, ESD or steel sliding rails within a section.

Sliding friction factor between sliding rail and chain

Average value, related to the total chain running time. The sliding friction factor increases along with increasing running time. Use of PTFE spray (3 842 546 150) reduces this value.

Material	Condition of contact surfaces	POM	Steel-plated
Plastic	Dry	0.25	–
	Water	0.25	–
	Refrigerant	0.12	–
	Oil	0.12	–
Paper	Dry	0.30	
Glass	Dry	0.18	0.25 ³⁾
	Water	0.18	
	Refrigerant	0.17	
	Oil	0.17	
Metal	Dry	0.26	0.25 ³⁾
	Water	0.26	
	Refrigerant	0.11	
	Oil	0.11	

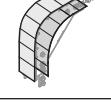
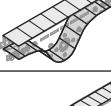
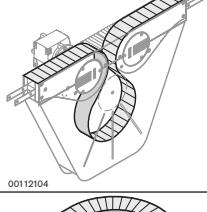
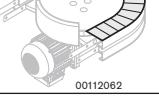
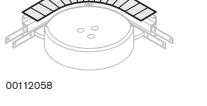
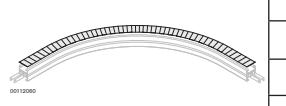
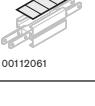
³⁾ With sharp-edged parts, the value must be experimentally determined.

Sliding friction factor between goods and chain

Sliding friction factors typical for a product type. The actual factors must be determined by experimentation for a precise result.

Actual chain and sliding rail lengths of the components

For an estimated chain and sliding rail length calculation

		Actual chain length (m)				Effective sliding rail length (m)					
		Size				Size					
		65	90	120	160-320						
Head drive		0.881					2x 0.2				4x 0.2
Return unit		0.742					2x 0.2				4x 0.2
90° return unit		0.483					4x 117				
Center drive		1.1385					2x 514				
Connection drive		1.51					4x 0.2				
Curve wheel drive		0.68	0.72				0.82	0.91			
Curve wheel	30°	2x 0.28	2x 0.28	2x 0.29			2x 0.34	2x 0.35	2x 0.38		
	45°	2x 0.32	2x 0.33	2x 0.34			2x 0.38	2x 0.41	2x 0.44		
	90°	2x 0.44	2x 0.46	2x 0.48			2x 0.53	2x 0.58	2x 0.63		
	180°	2x 0.68	2x 0.72	2x 0.77			2x 0.82	2x 0.91	2x 1.01		
Roller curve (R500)	30°				2x 0.46					5x 0.46	
	45°				2x 0.59					5x 0.59	
	90°				2x 0.98					5x 0.98	
	180°				2x 1.77					5x 1.77	
Sliding curve horizontal (R700)	30°	2x 0.56					4x 0.56				
	45°	2x 0.75					4x 0.75				
	90°	2x 1.3					4x 1.3				
Vertical curve	5°	2x 0.24					4x 0.24				8x 0.24 ^{*)}
	7.5°	2x 0.26					4x 0.26				8x 0.26 ^{*)}
	15°	2x 0.33					4x 0.33				8x 0.33 ^{*)}
	30°	2x 0.46					4x 0.46				8x 0.46 ^{*)}
	45°	2x 0.59					4x 0.59				8x 0.59 ^{*)}
Assembly module		2x 0.24					4x 0.24				6x 0.24

^{*)} with support profile

Drive data

Definition of the basic principles of motor specifications

The specified performances, torques and revolutions per minute are rounded values and apply to:

- Operating time/day = 8 h (100% duty cycle)
- Uniform operation (continual), no, or very light, impacts in a rotational direction at 10 switching cycles/hour
- Installation positions and designs described in the catalog
- Maintenance-free gears with life-long lubrication,
- Ambient operating temperature 0 ... 60 °C. Gear unit with life-long lubrication for ambient operating temperature ≤0°C available on request
- Protection class IP 55
- $f_{\text{mains}} = 50 \text{ Hz}$ constant
- $T_U = 20 \text{ }^{\circ}\text{C}$ for gears,
 $40 \text{ }^{\circ}\text{C}$ for motors

- Installation altitude ≤ 1000 m above sea level
- If the drive is overloaded, the service life is reduced.
 10% overloading = 75% service life
 20% overloading = 50% service life
- The gear motor (GM = 1) corresponds to the operating mode S1 (continuous operation)

In the case of other operating conditions, the achievable values may differ from those stated.

In the case of extreme operating conditions, please consult your distribution partner.

Motor data

Electrical connection requirements:

Connection to a 3-phase, 5-wire system (L1, L2, L3, N, PE); a connection plan is included in the terminal box. All motors are equipped with a thermal contact*, which has to be connected to an overload switch-off.

All of the motors comply with protection class IP 55.

*) Bi-metal thermal contact, opening, tripping at $150\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$.

Motor for push-on gearbox (with plug AT=S)



Gear motor (with plug AT=S)



Country classification

	Europe	Switzerland	USA	Canada	Brazil	Australia	New Zealand	South Korea	China	India
Line voltage (3x....)	400 V	400 V	480 V ¹⁾	480 V ¹⁾ 575 V	220 V 380 V ³⁾ 440 V ¹⁾	400 V 415 V ²⁾	400 V 415 V ²⁾	220 V 380 V ³⁾ 440 V ¹⁾	380 V ²⁾	415 V ²⁾
Line voltage tolerance	$\pm 10\%$	$\pm 10\%$	$\pm 10\%$	$\pm 10\%$	$\pm 10\%$	$\pm 5\%$	$\pm 5\%$			$\pm 5\%$
Mains frequency	50 Hz	50 Hz	60 Hz	60 Hz	60 Hz	50 Hz	50 Hz	60 Hz	50 Hz	50 Hz

¹⁾ $\sim 460\text{ V} / 60\text{ Hz}$

²⁾ $\sim 400\text{ V} / 50\text{ Hz}$

³⁾ $\sim 400\text{ V} / 60\text{ Hz}$

Motor data (GM = 1, 3)

Performance data

Notice: Values are typical. Subject to change. See motor type plate for official data.
Please note the country assignment.

Voltage class	A	A	B	D
Circuit	Δ	Y	Y	Y
Voltage U at f = 50 Hz	200 V ±10%		400 V +10...-12 %	
Voltage U at f = 60 Hz	220 V ±10%	400 V ±10%	460 V +10...-12%	575 V ±10%

Motor type	IE3	Current consumption at rated power				Power factor $\cos \varphi$	Power output at	
		I _N (A)	I _N (A)	I _N (A)	I _N (A)		(50Hz) P (kW)	(60Hz) P (kW)
524	x	0.65	0.35	0.32	0.24	0.6	0.09	0.1
624	x	1.15	0.65	0.55	0.45	0.66	0.18	0.22
634	x	1.65	0.9	0.85	0.65	0.6	0.25	0.29
714b	x	1.9	1.1	0.95	0.75	0.73	0.37	0.42
804a	x	3.1	1.8	1.45	1.15	0.65	0.55	0.63
716	x	1.3	0.75	0.6	0.62	0.68	0.18	0.22
734	x	1.9	1.05	0.95	0.72	0.74	0.37	0.42
734a	x	2.5	1.4	1.3	1	0.66	0.45	0.52
714a	x	1.65	0.95	0.85	0.65	0.60	0.25	0.29
716a	x	1.3	0.75	0.6	0.52	0.61	0.18	0.22
718b	x	0.95	0.55	0.48	0.38	0.6	0.12	0.14
814	x	3.1	1.7	1.45	1.1	0.69	0.55	0.63
824	x	4.1	2.25	2	1.6	0.66	0.75	0.86

Suitable for continuous operation (S1) and start-stop operation with a duty cycle of up to 70% (S3/70%-10 s) and frequency converter operation.

Certification for the motor, cable and plug components:

IE3 motors: CE, CURUS, CCC

 Gear motor

3-phase motors

T _U (°C)	P _V / P _N
< 40	1 ¹⁾
45	0.95
50	0.90
55	0.85
60	0.8

¹⁾ Rated motor power (0.37; 0.25; 0.12 kW)

Rated motor power

The ambient operating temperature T_U influences the rated power P_N of the gear motors.

Transport and nominal speed v_N (GM = 1)

The transport speed v_N is specified for the rated output and frequencies of 50 Hz or 60 Hz.

The actual values v vary depending on:

- Tolerance of the standard motors
- Performance range of the motors
- Load on the conveyor section

Modular unit 50 Hz (see p. 317)	Motor type						60 Hz (see p. 317)				Motor type	
	v_N (m/min)	$v^1)$ (m/min)	i	$n2^3)$ (min ⁻¹)	M_N (Nm)		$v^1)$ (m/min)	i	$n2^3)$ (min ⁻¹)	M_N (Nm)		
Head drive/ center drive	5	5.2	60	11.5	94	718b	6.4	60	14	92	718b	
	10	10.6	60	23.3	97	714a	8.3	60	18.3	108	716a	
	13	13.2	47	29.2	114	714b	12.9	60	28.5	92	714a	
	16	16.8	37	37.1	91	714b	15.9	47	35.0	108	714b	
	21	21.6	29	47.7	71	714b	20.2	37	44.5	87	714b	
	27	27.2	23	60.0	57	714b	26.0	29	57.3	67	714b	
	33	33.3	19	73.5	46	714b	32.6	23	72.0	53	714b	
	40	40.8	15	90.0	38	714b	39.9	19	88.2	44	714b	
	50	49.9	12	110.2	30	714b	48.9	15	108.0	36	714b	
Connection drive	5	5.2	60	11.5	94	718b	6.4	60	14	92	718b	
	10	10.6	60	23.3	97	714a	8.3	60	18.3	108	716a	
	13	13.2	47	29.2	114	714b	12.9	60	28.5	92	714a	
	16	16.8	37	37.1	91	714b	15.9	47	35.0	108	714b	
	21	21.6	29	47.7	71	714b	20.2	37	44.5	87	714b	
	27	27.2	23	60.0	57	714b	26.0	29	57.3	67	714b	
Curve wheel drive VF65	5	5.2	128	5.4	60 ²⁾	718b	6.2	128	6.5	60 ²⁾	718b	
	10	11.1	60	11.5	60 ²⁾	718b	13.5	60	14	60 ²⁾	718b	
	13	14.5	60	15.1	60 ²⁾	716a	17.6	60	18.3	60 ²⁾	716a	
	21	22.4	60	23.3	60 ²⁾	714a	27.4	60	28.5	60 ²⁾	714a	
Curve wheel drive VF90	5	5.6	128	5.4	60 ²⁾	718b	6.8	128	6.5	60 ²⁾	718b	
	10	12.0	60	11.5	60 ²⁾	718b	14.6	60	14	60 ²⁾	718b	
	13	15.7	60	15.1	60 ²⁾	716a	19.0	60	18.3	60 ²⁾	716a	
	21	24.2	60	23.3	60 ²⁾	714a	29.6	60	28.5	60 ²⁾	714a	

¹⁾ Transport speeds at other voltages/frequencies available on request

²⁾ Torque limited to 60 Nm by coupling

³⁾ Gear unit output speed

Transport and nominal speed v_N (GM = 3)

The transport speed v_N is specified for the rated power and frequencies of 50 Hz or 60 Hz.

The actual values v vary depending on:

- ▶ Tolerance of the standard motors
- ▶ Performance range of the motors
- ▶ Load on the conveyor section

Modular unit 50 Hz (see p. 317)	Motor type					60 Hz (see p. 317)				Motor type
	v_N (m/min)	$v^1)$ (m/min)	i	$n2^3)$ (min ⁻¹)	M_N (Nm)	$v^1)$ (m/min)	i	$n2^3)$ (min ⁻¹)	M_N (Nm)	
Head drive/ center drive	10	10.6	60	23.3	19	634				
	13	12.7	50	28.0	27	634	12.84	60	28.00	19
	16	15.9	40	35.0	28	634	15.41	50	33.6	27
	21	21.2	30	46.7	30	634	19.27	40	42	28
	27	25.4	25	56.0	25	634	25.69	30	56.00	30
	33	31.7	20	70.0	24.9	634	30.83	25	67.2	25
	40	42.3	15	93.3	19.7	634	38.53	20	84	23.6
	50	52.9	12	116.7	15.3	634	51.38	15	112.00	18.7
Connection drive	10	10.6	60	23.3	19	634				
	13	12.7	50	28.0	27	634	12.84	60	28.00	19
	16	15.9	40	35.0	28	634	15.41	50	33.6	27
	21	21.2	30	46.7	30	634	19.27	40	42	28
	27	25.4	25	56.0	25	634	25.69	30	56.00	30

¹⁾ Transport speeds at other voltages/frequencies available on request

²⁾ Torque limited to 60 Nm by coupling

³⁾ Gear unit output speed

Design information, transport and nominal speed

v_N 60-120 m/min

For layouts of applications beyond the conveyor speeds of 60 m/min, special design rules apply to ensure smooth

The design shall take into account the following:

Overall system restrictions

- Conveyor speed: $v_N \leq 120$ m/min
- Permissible chain tensile force: $F_{max} = 150$ N
- Section length: $L \leq 25$ m
- Curve angle: $\sum \alpha \leq 210^\circ$
Sum of all curve angles of the installed horizontal and vertical curves in a section
- Ambient conditions: Dry

Component restrictions

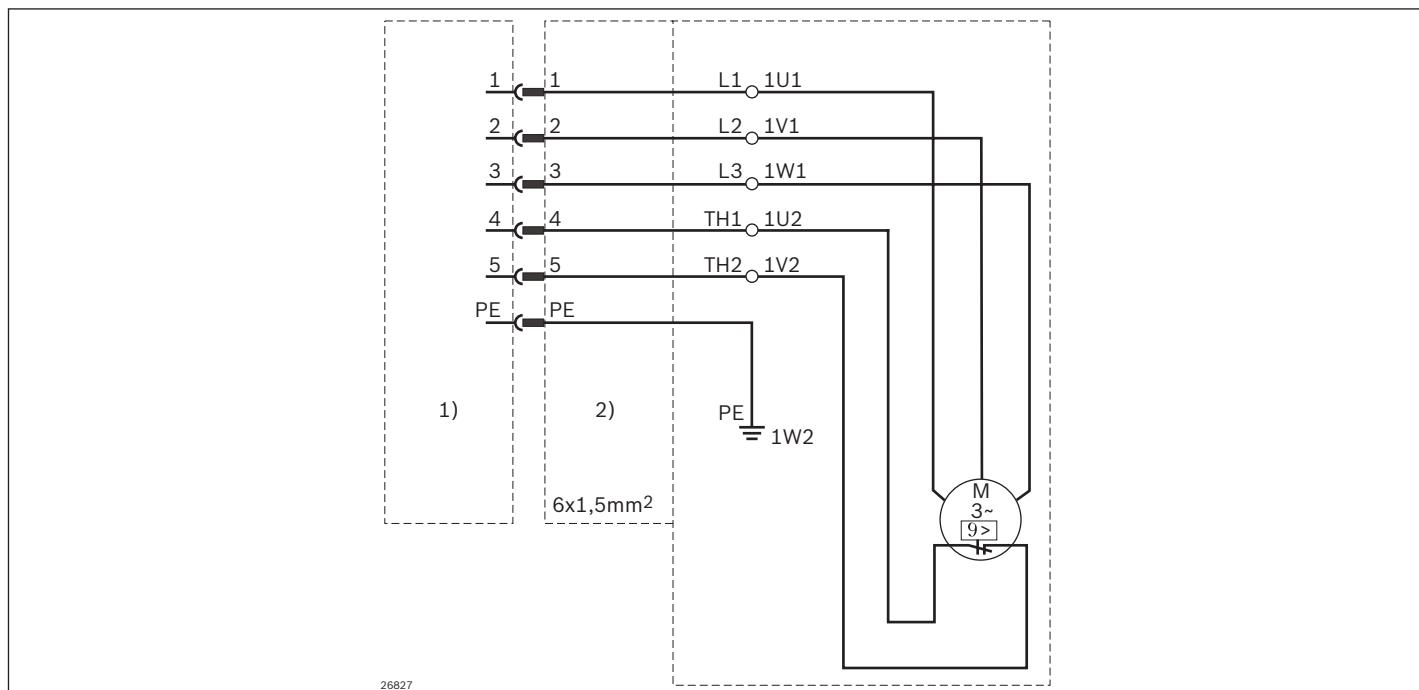
- System widths: VFplus 65, VFplus 90, VFplus 120
- Chain types: Flat conveyor chain, static friction chain.
Use of other chain types possible, subject to all design instructions, at your discretion regarding suitability for high-speed applications.
- Basic units: Head drive directly, head drive closed
- Curve types: Sliding curve, curve wheel, horizontal/vertical curves from standard program, modification curves possible if all conditions are met
- Curve radii (min): $R \geq 700$ mm for horizontal curves, $R \geq 500$ mm for vertical curves
- Sliding rail: Sliding rail VFplus Premium

Further information

- Soft start using a frequency converter is mandatory
- Need to calculate and validate design using MTpro

Motor connection

Motor connection with plug (AT = S), circuit diagram



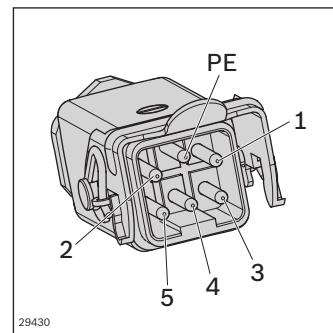
1) Connection cable side

2) Motor side

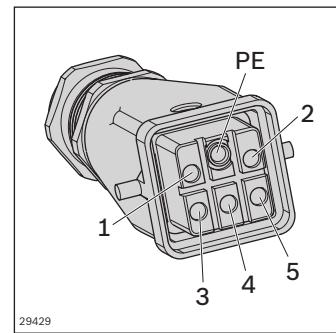
The push-in fitting consists of UL components.

Connection list

3~ motor connection terminals	Pin no.	Code
U1	1	L1
V1	2	L2
W1	3	L3
TW1	4	Th1
TW2	5	Th2
PE		PE



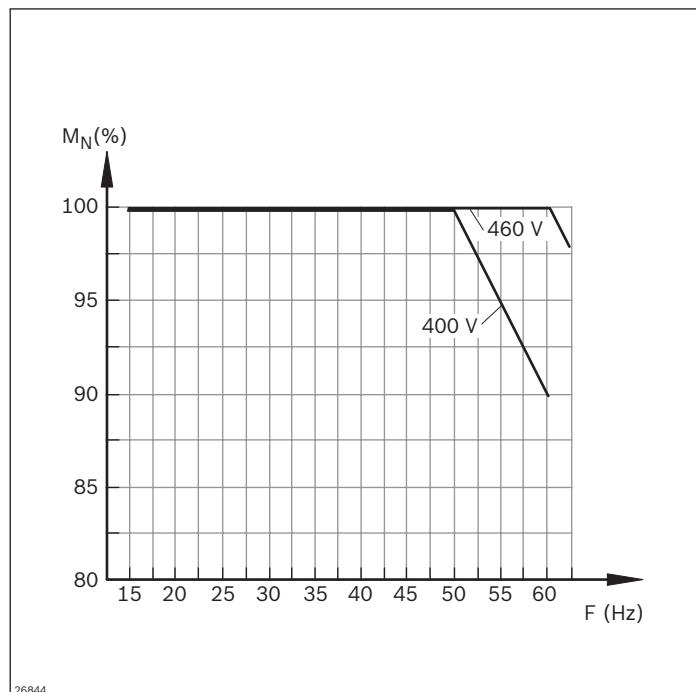
Motor side



Connection cable side

Frequency converter motec 8400 (FU)

Drive spectrum of motors with frequency converters (FU)



Technical information:

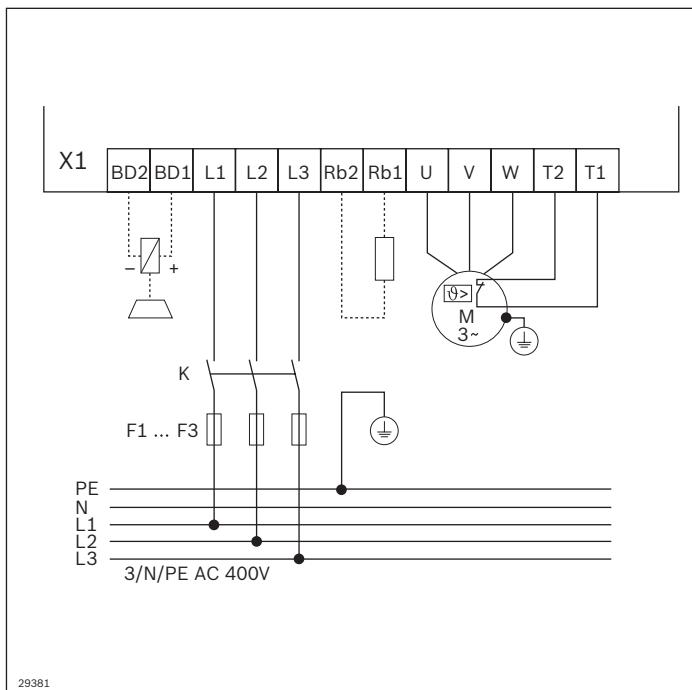
At rotating field frequencies of ≥ 15 Hz, the motor can be operated under normal operating conditions without an external fan. The motor's thermal conditions should be considered at rotating field frequencies of ≤ 20 Hz. In the range 20 ... 50 Hz, the full torque is available. At rotating field frequencies > 50 Hz, higher speeds can also be achieved with a corresponding drop in performance.

Motor speed range at 50 Hz	Min ¹⁾ (m/min)	Max ²⁾ (m/min)	Max (m/min) at max. 0 % moment
5 ³⁾	2	6	8
10 ³⁾	4	12	16
13	5	15	21
16	6	19	26
21	7	25	34
27	9	32	43
33	11	39	52
40	13	48	-
50	16	60	-

¹⁾ Min corresponds to approx. 16 Hz supply frequency

²⁾ Max corresponds to approx. 60 Hz supply frequency

³⁾ At 460 V/60 Hz max (m/min) 20% higher



Frequency converter (FU) accessories

In order to operate a drive with a frequency converter (FU), the user needs to work out the minimum wiring for the internal and external voltage supply (see terminal assignment plan left).

— Minimum wiring required for operation
 ----*)---- Additional wiring to change rotational direction

Ordering parameters for SEW motors (GM = 2)

The following ordering information is required if using gear motors from SEW-Eurodrive GmbH & Co, Bruchsal:

- Motor type
- Ratio
- Installation position
- Drive output position
- Terminal box position

- Cable entry (fig. 4)
- Motor voltage/frequency^{*)}
- Thermal class^{*)}
- Motor protection class^{*)}

^{*)} www.seweurodrive.com

Gear motors for line frequency f = 50 Hz

v_N (m/min)	1st v_N (m/min)	Motor type	Ratio	Drive speed gear motor	N (kW)	M_{max} (Nm)
5	5.9	SA47 DRN71MS4/TH	110.73	13.00	0.25	90
5 ¹⁾	6.7	SA47 DRN71MS4/TH	201	7.00	0.25	90 / 60 ³⁾
5 ²⁾	7.3	SA47 DRN71MS4/TH	201	7.00	0.25	90 / 60 ³⁾
7	7.7	SA47 DRN71MS4/TH	84	17.00	0.25	90
10	11.8	SA47 DRN71M4/TH	54.59	26.00	0.37	90
10 ¹⁾	10.6	SA47 DRN71M4/TH	128.1	11.00	0.37	90 / 60 ³⁾
10 ²⁾	10.4	SA47 DRN80MK4/TH	137.1	10.00	0.55	90 / 60 ³⁾
13	14.5	SA47 DRN80MK4/TH	44.22	32.00	0.55	90
13 ¹⁾	14.4	SA47 DRN80MK4/TH	94.1	15.00	0.55	90 / 60 ³⁾
13 ²⁾	13.5	SA47 DRN71M4/TH	110.7	13.00	0.37	90 / 60 ³⁾
16	16.8	SA47 DRN71M4/TH	38.23	37.00	0.37	78
21	22.2	SA47 DRN71M4/TH	29	49.00	0.37	60
21 ¹⁾	21.1	SA47 DRN71M4/TH	63.8	22.00	0.37	60
21 ²⁾	20.8	SA47 DRN71M4/TH	69.4	20.00	0.37	60
27	27.6	SA47 DRN71M4/TH	23.2	61.00	0.37	49
33	36.2	SA47 DRN80MK4/TH	17.62	80.00	0.37	40
40	45.7	SA47 DRN80MK4/TH	14.24	101.00	0.55	48
50	53.9	SA47 DRN80MK4/TH	12.1	119.00	0.55	41
4 ... 26	2.4-24	SA47 DRN71M4/MM05	54.59	5.3 ... 53.0	0.055-0.55	69 ... 81
16 ... 60	7.2-74	SA47 DRN80MK4/MM07	17.62	16 ... 165.0	0.075-0.75	36 ... 39

For basic unit curve wheel drive:

¹⁾ VFplus 65 (z = 28 / ø306 mm)

²⁾ VFplus 90 (z = 30 / ø331 mm)

³⁾ at KPG = 1 limited to 60 Nm

Gear motors for line frequency f = 60 Hz

v_N (m/min)	1st v_N (m/min)	Motor type	Ratio	Drive speed gear motor	N (kW)	M_{max} (Nm)
5	5.9	SA47 DRN71MS4/TF	128.10	13.00	0.25	90
5 ¹⁾	8.3	SA47 DRN71MS4/TH	201.00	8.60	0.25	90 / 60 ³⁾
5 ²⁾	8.9	SA47 DRN71MS4/TF	201.00	8.60	0.25	90 / 60 ³⁾
7	8.2	SA47 DRN71MS4/TF	94.08	18.00	0.25	90
10	12.2	SA47 DRN71M4/TH	63.80	27.00	0.37	90
10 ¹⁾	10.6	SA47 DRN71M4/TH	158.12	11.00	0.37	90 / 60 ³⁾
10 ²⁾	11.4	SA47 DRN80MK4/TH	158.12	11.00	0.55	90 / 60 ³⁾
13	14.5	SA47 DRN80MK4/TH	54.59	32.00	0.55	90
13 ¹⁾	15.4	SA47 DRN80MK4/TH	110.73	16.00	0.55	90 / 60 ³⁾
13 ²⁾	14.6	SA47 DRN71M4/TH	128.10	14.00	0.37	90 / 60 ³⁾
16	17.7	SA47 DRN71M4/TH	44.22	39.00	0.37	90
21	24.0	SA47 DRN71M4/TH	32.48	53.00	0.37	67 / 60
21 ¹⁾	23.1	SA47 DRN71M4/TH	71.75	24.00	0.37	67 / 60 ³⁾
21 ²⁾	25.0	SA47 DRN71M4/TH	71.75	24.00	0.37	67 / 60 ³⁾
27	31.7	SA47 DRN71M4/TH	24.77	70.00	0.37	52
33	38.5	SA47 DRN71M4/TH	20.33	85.00	0.37	46
40	48.0	SA47 DRN80MK4/TH	16.47	106.00	0.55	37
50	55.7	SA47 DRN80MK4/TH	14.24	123.00	0.55	48
4 ... 26	2.4-24	SA47 DRN71M4/MM05	54.59	5.3 ... 53.0	0.055-0.55	69 ... 81
16 ... 60	7.2-74	SA47 DRN80MK4/MM07	17.62	16 ... 165.0	0.075-0.75	36 ... 39

For basic unit curve wheel drive:

¹⁾ VFplus 65 (z = 28 / ø306 mm)²⁾ VFplus 90 (z = 30 / ø331 mm)³⁾ at KPG = 1 limited to 60 Nm

Ordering parameters for SEW motors (GM = 4)

The following ordering information is required if using gear motors from SEW-Eurodrive GmbH & Co, Bruchsal:

- Motor type
- Ratio
- Installation position
- Drive output position
- Terminal box position

- Cable entry (fig. 4)
- Motor voltage/frequency^{*)}
- Thermal class^{*)}
- Motor protection class^{*)}

^{*)} www.seweurodrive.com

Gear motors for line frequency f = 50 Hz

v_N (m/min)	Ist v_N (m/min)	Motor type	Ratio	Drive speed gear motor	N (kW)	M_{max} (Nm)
5	5.0	SA37 DRN63M4/TH	122.94	11.00	0.18	90
5 ¹⁾	5.0	SA37 pR17DR2S56MR4/TH	265	5.20	0.09	90 / 60 ³⁾
5 ²⁾	4.8	SA37 pR17DR2S56MR4/TH	303	4.60	0.09	90 / 60 ³⁾
7	7.2	SA37 DRN71MS4/TH	86.36	16.00	0.25	90
10	9.1	SA37 pDRN71MS4/TH	71.44	20.00	0.25	90
10 ¹⁾	10.6	SA37 DRN63M4/TH	122.9	11.00	0.18	90 / 60 ³⁾
10 ²⁾	9.9	SA37 DRN63M4/TH	144.4	9.50	0.18	90 / 60 ³⁾
13	12.7	SA37 DRN71M4/TH	51.3	28.00	0.37	90
13 ¹⁾	13.5	SA37 pDRN63M4/TH	98.8	14.00	0.18	90 / 60 ³⁾
13 ²⁾	13.5	SA37 pDRN63M4/TH	106.0	13.00	0.18	90 / 60 ³⁾
16	17.2	SA37 DRN71M4/TH	37.66	38.00	0.37	78
21	20.8	SA37 DRN71M4/TH	30.68	46.00	0.37	60
21 ¹⁾	21.1	SA37 DRN71MS4/TH	63.3	22.00	0.25	60
21 ²⁾	20.8	SA37 DRN71MS4/TH	71.4	20.00	0.25	60
27	28.5	SA37 DRN71M4/TH	22.5	63.00	0.37	49
33	33.2	SA37 DRN71M4/TH	19.89	71.00	0.37	40
40	41.7	SA37 DRN80MK4/TH	15.53	92.00	0.55	48
50	48.5	SA37 DRN80MK4/TH	13.39	107.00	0.55	41
4 ... 26	5-25	SA37 pDRN80MK4/MM05	25.38	11-55	0.11-0.55	69 ... 81
16 ... 60	14-70	SA37 pDRN80M4/MM07	9.02	31-155	0.15-0.75	36 ... 39

For basic unit curve wheel drive:

¹⁾ VFplus 65 (z = 28 / ø306 mm)

²⁾ VFplus 90 (z = 30 / ø331 mm)

³⁾ at KPG = 1 limited to 60 Nm

Gear motors for line frequency f = 60 Hz

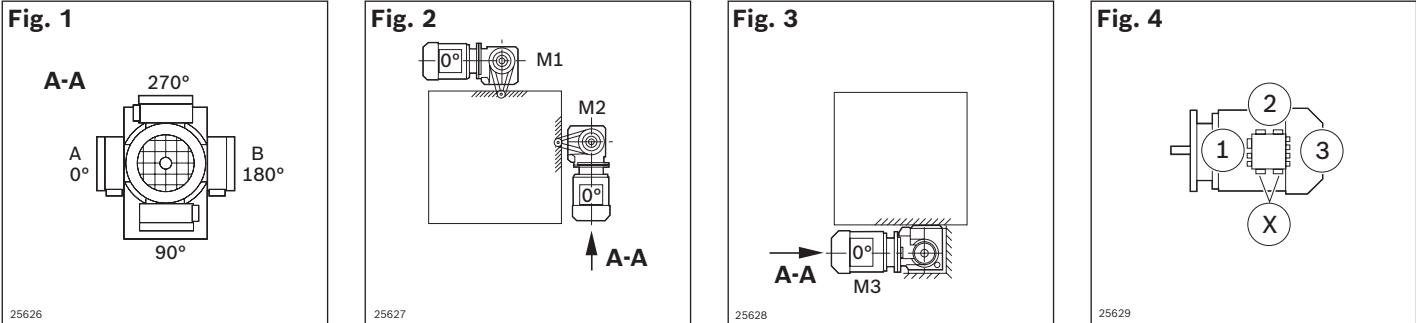
v_N (m/min)	Ist v_N (m/min)	Motor type	Ratio	Drive speed gear motor	N (kW)	M_{max} (Nm)
5	5.0	SA37 DRN63M4/TF	157.43	11.00	0.18	90
5 ¹⁾	5.1	SA37 DRN71MS8/TH	157.43	5.30	0.12	90 / 60 ³⁾
5 ²⁾	5.0	SA37 pR17DR2S56MR4/TF	351.00	4.80	0.09	90 / 60 ³⁾
7	7.2	SA37 DRN71MS4/TF	106.00	16.00	0.25	90
10	10.0	SA37 pDRN71M6	51.30	22.00	0.25	90
10 ¹⁾	10.6	SA37 DRN63M4/TH	157.43	11.00	0.18	90 / 60 ³⁾
10 ²⁾	10.4	SA37 DRN80MK8/TH	86.36	10.00	0.18	90 / 60 ³⁾
13	12.7	SA37 DRN90S8/TH	30.68	28.00	0.37	90
13 ¹⁾	13.5	SA37 DRN71MS4/TH	122.94	14.00	0.25	90 / 60 ³⁾
13 ²⁾	13.5	SA37 DRN71M6/TH	86.36	13.00	0.25	90 / 60 ³⁾
16	15.4	SA37 pDRN71M4/TH	51.30	34.00	0.37	90
21	20.8	SA37 pDRN71M4/TH	37.66	46.00	0.37	67 / 60
21 ¹⁾	22.0	SA37 DRN71MS4/TH	63.33	22.00	0.25	67 / 60 ³⁾
21 ²⁾	20.8	SA37 pDRN63M4/TH	86.36	20.00	0.18	67 / 60 ³⁾
27	27.2	SA37 pDRN71M4/TH	28.76	60.00	0.37	52
33	33.5	SA37 DRN80MK6/TH	15.53	74.00	0.37	46
40	39.4	SA37 pDRN71M4/TH	19.89	87.00	0.37	37
50	50.7	SA37 DRN80MK4/TH	15.53	112.00	0.55	48
4 ... 26	23.6	SA37 pDRN80MK4/MM05	25.38	52.0	0.11-0.55	69 ... 81
16 ... 60	12-58	SA37 pDRN80M4/MM07	10.91	--	0.15-0.75	36 ... 39

For basic unit curve wheel drive:

¹⁾ VFplus 65 (z = 28 / ø306 mm)²⁾ VFplus 90 (z = 30 / ø331 mm)³⁾ at KPG = 1 limited to 60 Nm

Head drive direct

Motor mounting	Installation position	Drive output	Terminal box
R	M2 (M1)	B	0°
L	M2 (M1)	A	180°

Position of terminal box**Installation position horizontal top/vertical****Installation position horizontal (above top edge chain)****Cable entry point**

Combination matrix



		Section profile AL open	Section profile AL closed	Assembly module	Curve wheel	Roller curve*	Horizontal sliding curve	Vertical curve	Head drive	Curve wheel drive	Connection drive	Center drive (STS)	Basic unit	90° **(STS)	Transmission kit
Straight	Section profile AL open	J													
	Section profile AL closed	J	J												
	Assembly module	J	J	N											
Curves	Curve wheel	J	J	L ²⁾	L ²⁾										
	Roller curve*	J	N	J	N	L ¹⁾									
	Horizontal sliding curve	J	J	J	J	N	L ¹⁾								
	Vertical curve	J	J	J	J	L ¹⁾	L ¹⁾	L ¹⁾							
Drives	Head drive	J	J	L ²⁾	L ²⁾	L ^{1, 4)}	L ¹⁾	L ^{1, 4)}	N						
	Curve wheel drive	J	J	L ²⁾	L ²⁾	N	L ¹⁾	L ¹⁾	N	N					
	Connection drive	J	J	L ²⁾	L ²⁾	N	L ¹⁾	L ¹⁾	N	N	N				
	Center drive (STS)**	L ⁵⁾	L ⁵⁾	L ^{2, 5)}	L ^{2, 5)}	N	L ^{1, 5)}	L ^{1, 5)}	N	N	N	N			
Return unit	Basic unit	J	J	L ²⁾	L ²⁾	L ^{1, 4)}	L ¹⁾	L ^{1, 4)}	L ²⁾	N	N	L ^{2, 3)}	L ^{2, 3)}		
	90° (STS)**	L ⁵⁾	L ⁵⁾	L ^{2, 5)}	L ^{2, 5)}	N	L ^{1, 5)}	L ^{1, 5)}	N	N	L ^{2, 5)}	N	N	L ²⁾	
Transmission kit		N	N	N	N	N	N	N	J	N	J	N	J	N	

J possible without restrictions

* Support profile must project 76+2 mm into the roller curve.

L possible with restrictions

** AL-STS adapter included in scope of delivery.

N not possible

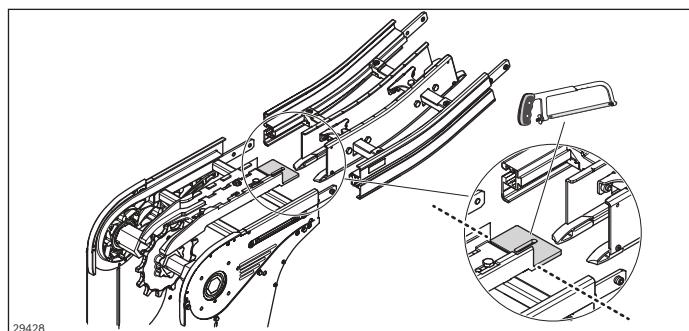
¹⁾ Profile connector not required

²⁾ Use of a profile piece ($L_{min} = 120$ mm)

³⁾ Assembly module required

⁴⁾ For sizes 160-320: shorten the support rail on the dotted line (see figure below)

⁵⁾ Use of the AL-STS adapter





		Straight		Curves		Drives		Return unit				
		Section profile STS open	Section profile STS Clean	Assembly module	Curve wheel	Roller curve*	Vertical curve	Head drive	Connection drive	Center drive	Basic unit	90° **
Straight	Section profile STS open	J										
	Section profile STS Clean	L ⁶⁾	L ⁶⁾									
	Assembly module	J	L ⁶⁾	N								
Curves	Curve wheel	J	L ⁶⁾	J	L ^{2, 7)}							
	Roller curve*	J	N	J	N	L ¹⁾						
	Vertical curve	J	L ⁶⁾	J	L ¹⁾	L ¹⁾	L ¹⁾					
Drives	Head drive	J	L ⁶⁾	J	L ¹⁾	L ^{1, 4)}	L ^{1, 4)}	N				
	Connection drive	J	L ⁶⁾	J	L ¹⁾	N	L ¹⁾	N	N			
	Center drive**	J	L ⁶⁾	J	L ¹⁾	N	L ¹⁾	N	N	N		
Return unit	Basic unit	J	L ⁶⁾	J	L ¹⁾	L ^{1, 4)}	L ^{1, 4)}	L ¹⁾	L ¹⁾	L ^{1, 3)}	L ^{1, 3)}	
	90° **	J	L ⁶⁾	J	L ¹⁾	N	L ¹⁾	L ¹⁾	L ¹⁾	N	N	

J possible without restrictions

* Support profile must project 76+2 mm into the roller curve.

L possible with restrictions

** AL-STS adapter included in scope of delivery.

N not possible

¹⁾ Profile connector not required

²⁾ Use of a profile piece (L_{min} = 224 mm)

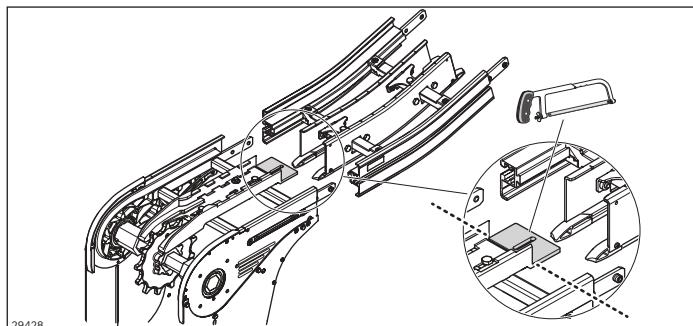
³⁾ Assembly module required

⁴⁾ For sizes 160-320: shorten the support rail on the dotted line (see figure below)

⁵⁾ Use of the AL-STS adapter

⁶⁾ Replacement of the standard profile connector with profile connector STS Clean Section

⁷⁾ Directly possible with left-right change (one profile connector no longer required)





		Straight		Curves		Drives		Return unit	
		Section profile AL open	Section profile AL closed	Assembly module	Curve wheel ESD	Vertical curve (STS)	Head drive (STS)	Connection drive (STS)	Center drive (STS)
Straight	Section profile AL open	J							
	Section profile AL closed	J	J						
	Assembly module	J	J	N					
Curves	Curve wheel ESD	J	J	L ²⁾	L ²⁾				
	Vertical curve	J	J	L ²⁾	L ²⁾	L ¹⁾			
Drives	Head drive (STS)	L ⁵⁾	L ⁵⁾	L ^{2, 5)}	L ^{2, 5)}	L ^{1, 5)}	N		
	Connection drive (STS)	L ⁵⁾	L ⁵⁾	L ^{2, 5)}	L ^{2, 5)}	L ^{1, 5)}	N	N	
	Center drive (STS)**	L ⁵⁾	L ⁵⁾	L ^{2, 5)}	L ^{2, 5)}	L ^{1, 5)}	N	N	N
Return unit	Basic unit (STS)	L ⁵⁾	L ⁵⁾	L ^{2, 5)}	L ^{2, 5)}	L ^{1, 5)}	L ²⁾	L ²⁾	L ^{2, 3)}
	90° (STS)**	L ⁵⁾	L ⁵⁾	L ^{2, 5)}	L ^{2, 5)}	L ^{1, 5)}	L ²⁾	N	N

J possible without restrictions

* Support profile must project 76+2 mm into the roller curve.

L possible with restrictions

** AL-STS adapter included in scope of delivery.

N not possible

¹⁾ Profile connector not required

²⁾ Use of a profile piece ($L_{min} = 224$ mm)

³⁾ Assembly module required

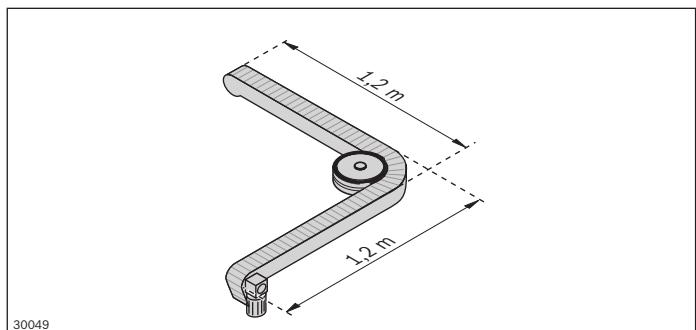
⁴⁾ For sizes 160-320: shorten the support rail on the dotted line

⁵⁾ Use of the AL-STS adapter

⁶⁾ Replacement of the standard profile connector with profile connector STS Clean Section

⁷⁾ Directly possible with left-right change (one profile connector no longer required)

Use in clean rooms



The VarioFlow *plus* 90 conveyor system has been tested for clean room suitability according to the procedures described in the EN ISO 14644-1 standard for clean room and cleanliness suitability testing. The subsequent measurement results for a conveyor system VarioFlow *plus* 90 (AL) were obtained:

The results are based on an application in an L-configuration using a 90° curve wheel and flat conveyor chain, without load!

Values for Premium and Advanced sliding rails

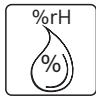
Speed <i>v</i> (m/min)	ISO class
6	6
20	7
50	7

Before commissioning a chain conveyor system in a clean room, the following must be observed:

- Install the sliding rails according to the assembly instructions (avoid joints, round off all edges and intersections on the sliding rails)
- Check the chain inlets and outlets, if necessary round off edges
- Check the intersections, if necessary round off edges
- Run in for approx. 100 hours to adapt the sliding rail and chain (abrasion and unevenness of plastics)
- Clean the system and the chain
- Transfer of the system via airlock into the clean room
- Repeatedly clean the system and the chain with isopropanol

Due to the identical system configurations of sizes 65 and 120, the result can also be transferred to these sizes. Sliding curves are not suitable for use in clean rooms due to the increased friction and associated wear.

Design information, use in dry rooms (0.5% to 5% RH)



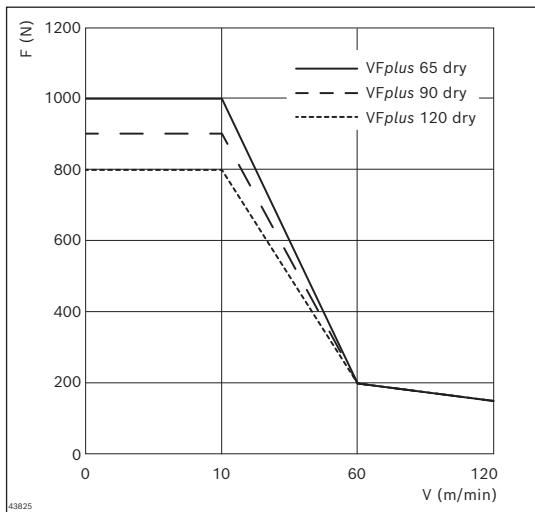
Note the following for application layouts in environments with a relative humidity of 0.5% RH to 5% RH:

Restrictions

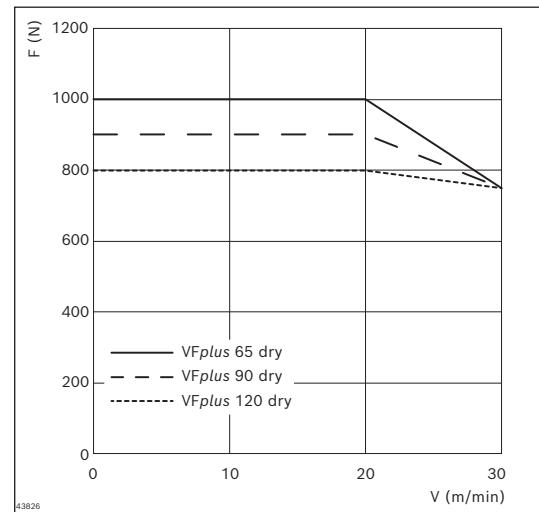
- Only for system widths VFplus 65, VFplus 90, VFplus 120
- Permissible chain tensile force:
VFplus 120: $F_{\max} = 1000 \text{ N}$
VFplus 90: $F_{\max} = 900 \text{ N}$
VFplus 65: $F_{\max} = 800 \text{ N}$
- Section length: $L \leq 30 \text{ m}$
- Conveyor speed: $v_N \leq 120 \text{ m/min}$
For conveyor speeds of $v_N 60 \text{ m/min}$ to $\leq 120 \text{ m/min}$, further restrictions apply for high-speed applications (see p. 320)
- No use of the ESD system

To be noted for chain assembly:

- Operate the spindle of the chain assembly tool only by hand < 1 revolution per second!
- Check the connection for ease of movement

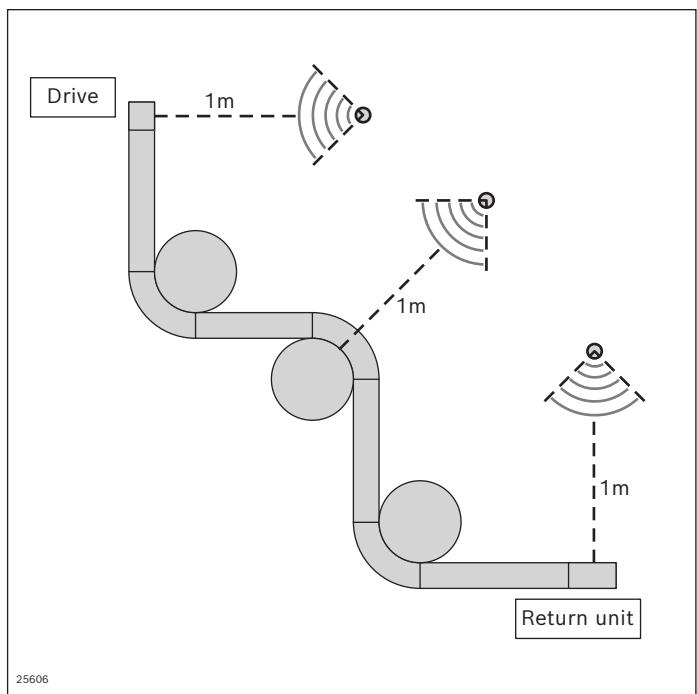


Permissible chain tensile force as a function of speed $F(v)$ (N); max. 1000 N



Permissible chain tensile force as a function of conveyor section length $F(L)$ (N); max. 1000 N

Conveyor noise level



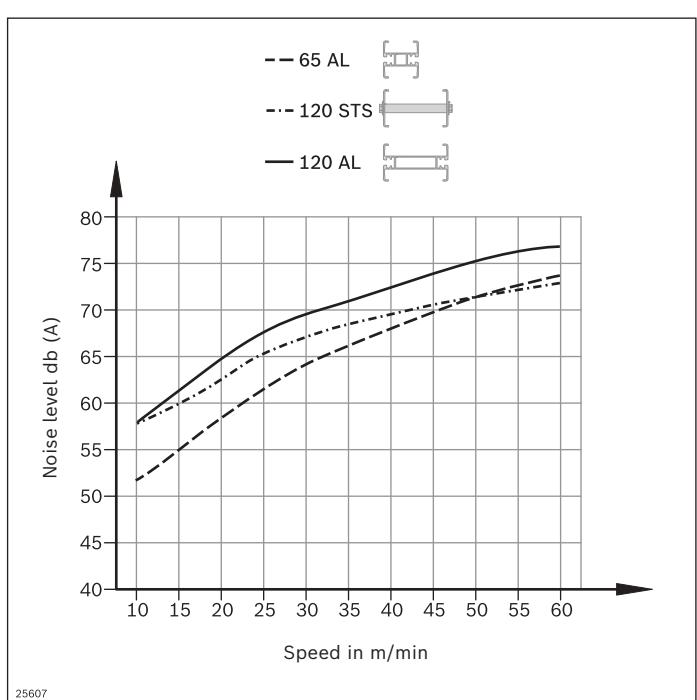
The noise caused by the transport chain decreases after a few days of operation. In general, higher speed results in higher noise levels. The actual noise level depends on several factors:

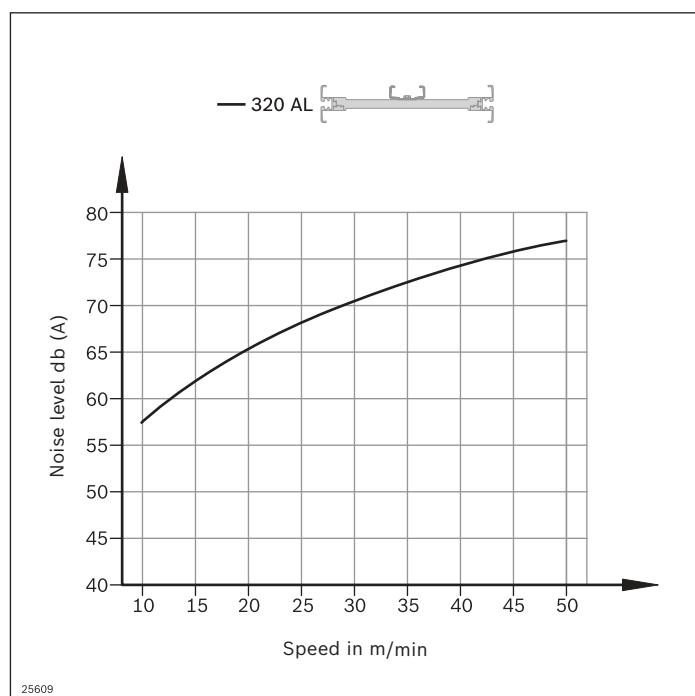
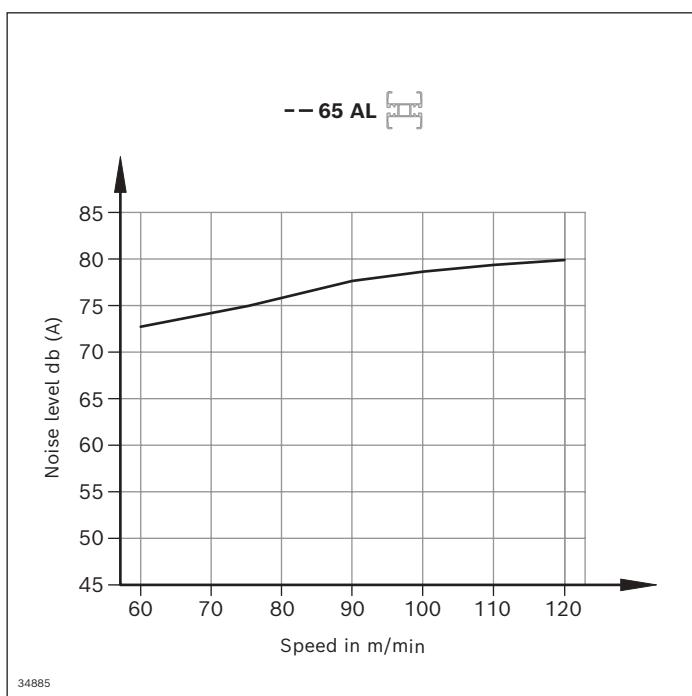
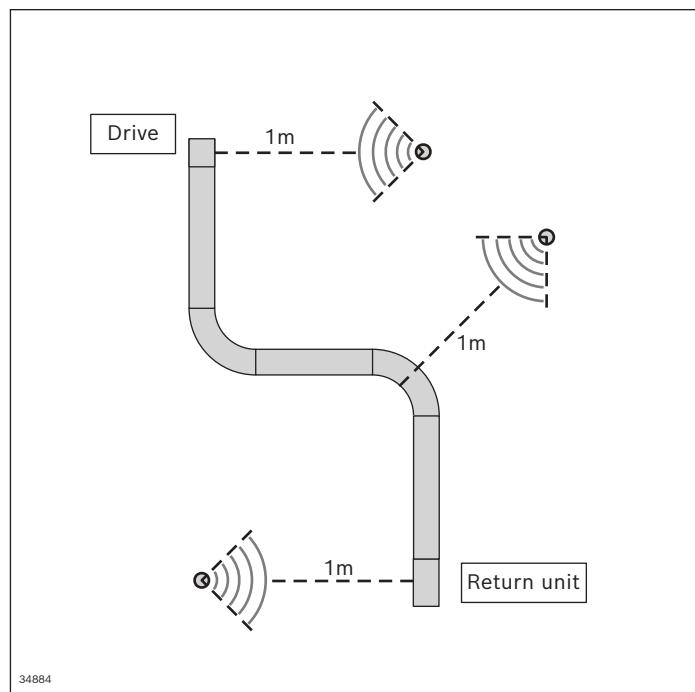
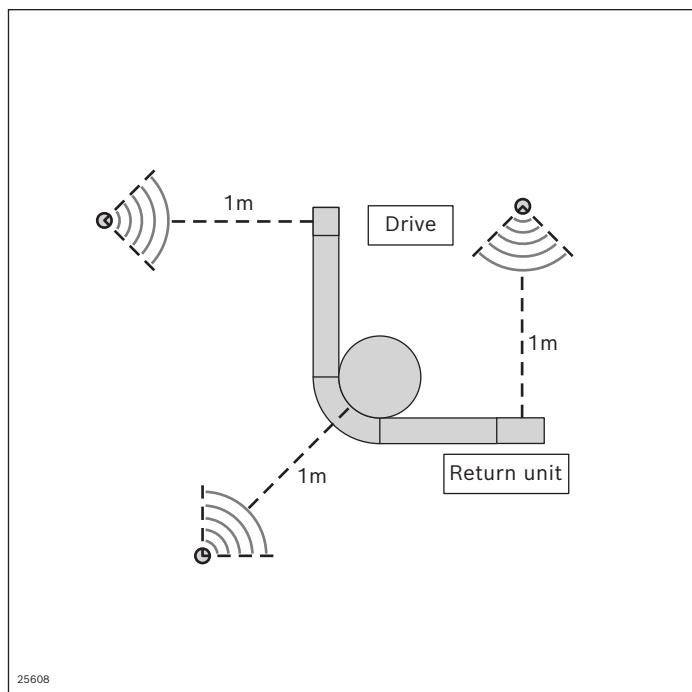
- the product on the conveyor medium
- the chain type
- the drive type
- the installation location and fastening of the system (floor, ceiling, wall)
- the ambient conditions (vibrating objects, hard reflective walls, integrated systems of other makes, hall structures)
- the quality of system assembly and layout in accordance with the assembly instructions (sliding rail transitions, joints)
- the surrounding equipment
- conveyor layout and dimensions

Typical noise levels are shown in the illustration. The noise level was measured with a distance of 1 m from the conveyor.

The measurement was taken in an industrial hall (ambient noise from approx. 50 dB (A) to 63 dB (A)) with medium-length chain bag.

Notice: Sound measurements carried out in an acoustic laboratory can be significantly lower. However, the sound levels determined in this case cannot be achieved under common production conditions.





Resistance of the chain against chemicals

Chemical	Material
Acids:	POM
Benzoic acid	0
Hydrogen cyanide	–
Boric acid	0
Chromic acid	–
Acetic acid	0
Hydrofluoric acid	–
Tannic acid	0
Oleic acid	0
Oxalic acid	–
Perchloric acid	–
Phosphoric acid	–
Phthalic acid	–
Nitric acid	–
Hydrochloric acid	–
Sulfuric acid	–
Tartaric acid	0
Citric acid	0

++ = high resistance

+ = limited resistance

0, – = unsuitable combination of materials

·/· = no data available

The materials used are resistant to most chemicals used in industrial applications, even in case of longer contact. For some chemicals, the reaction also depends on concentration and aggregate state.

Contact with the following substances should be avoided:

- Acids with a pH level ≤ 4
- Bases with a pH value ≥ 9
- Chlorinated hydrocarbons (e.g. trichloroethylene/Tri).

For accurate information on resistance, contact the chemical manufacturer; only they can give an official answer to your question. The materials used in the individual components can be found on pages 338 and 339.

Chemical	Material
Alkaline substances:	POM
Ammonia (dissolved)	++
Lime hydrate	++
Sodium hydroxide	++
Caustic potash	++
Salts:	
Basic salts	++
Potassium bicarbonate	+
Potassium permanganate	+
Sodium cyanide	+
Sodium hypochloride	0
Neutral salts	++
Acidic salts	+
Solvents/organic media:	
Acetone	+
Solvents/organic media:	
Aniline	+
Gasoline	+
Benzene	++
Butanol	+
Chlorobenzene	++
Chloroform	++
Acetic ether	++
Ethyl alcohol	++
Ethyl ether	++
Formalin	+
Heptane	+
Methyl alcohol	++
Methyl ethyl ketone	++
Nitrobenzene	+

Chemical	Material
Solvents/organic media:	
Phenol	0
Carbon disulfide	++
Turpentine substitute	·/·
Carbon tetrachloride	++
Toluene	++
Gases:	
Chlorine (wet)	-
Chlorine (dry)	+
Carbon dioxide	0
Carbon monoxide	+
Sulfur dioxide (wet)	-
Sulfur dioxide (dry)	+
Hydrogen sulfide	0

Material use

Chains

	Steel, non-rusting	POM	PA	TPE
Flat conveyor chain	x	x	x	
Static friction chain	x	x	x	x
Accumulation roller chain	x	x	x	
Roller cleated chain ø20	x	x	x	
Roller cleated chain ø35	x	x	x	
Cleated chain	x	x	x	
Universal chain	x	x	x	
Steel-plated chain	x	x	x	
Flocked chain	x	x	x	
Wedge chain	x	x	x	x
Conveyor chain ESD	x	x	x	

Drives

	Aluminum	Diecast aluminum	Steel, galvanized	Steel, non-rusting	Steel	PA	POM	PP
Head/connection drive AL	x	x	x	x		x		x
Head/connection/ curve wheel drive AL incl. ball catch coupling	x	x	x	x	x	x		x
Head/connection/ center drive STS				x		x	x	x
Return unit AL	x	x	x	x		x		x
Return unit STS				x		x		x
90° return unit				x		x		x
Connection kit passive bridges				x			x	

Sections

	Anodized aluminum	Diecast aluminum	Steel, galvanized	Steel, non-rusting	Brass, nickel-plated	PA	PP	PE-UHMW	PE	HDPE	10
Straight section AL	x	x	x								
Straight section STS					x						
Vertical + horizontal sliding curve AL	x		x								
Vertical sliding curve STS					x						
Curve wheel AL	x	x	x	x		x					
Curve wheel STS					x		x				
Roller curve AL	x	x	x	x		x		x			
Roller curve STS					x		x		x		
Chain assembly module AL	x		x								
Chain assembly module STS					x						
Leg sets AL	x	x	x				x				
Leg sets STS			x	x	x	x	x				
Product guide	x		x	x		x			x	x	
Plastic sliding rail								x			
Sliding rail STS				x							

Material number overview

3 842 191 182	63	3 842 539 495	234	3 842 546 150	300	3 842 547 080	73
3 842 345 081	64	3 842 539 496	235	3 842 546 625	121	3 842 547 081	73
3 842 513 581	255	3 842 539 497	235	3 842 546 626	121	3 842 547 082	73
3 842 518 367	63	3 842 539 498	233	3 842 546 627	121	3 842 547 083	75
3 842 518 368	63	3 842 539 499	233	3 842 546 628	125	3 842 547 084	75
3 842 518 369	63	3 842 539 500	235	3 842 546 629	125	3 842 547 085	75
3 842 523 258	63	3 842 539 501	236, 237, 238	3 842 546 630	125	3 842 547 086	75
3 842 527 553	213	3 842 539 505	236, 237	3 842 546 632	127	3 842 547 087	75
3 842 527 738	230	3 842 539 613	228	3 842 546 643	53	3 842 547 088	75
3 842 527 851	230	3 842 539 826	236, 237	3 842 546 644	53	3 842 547 089	75
3 842 528 009	234	3 842 540 173	125	3 842 546 645	53	3 842 547 090	75
3 842 528 531	302	3 842 540 668	122	3 842 546 647	55	3 842 547 091	75
3 842 528 539	239	3 842 541 003	296	3 842 546 649	135	3 842 547 092	75
3 842 528 540	239	3 842 541 246	65	3 842 546 658	191, 213	3 842 547 093	75
3 842 528 715	64	3 842 541 409	65	3 842 546 659	191, 213	3 842 547 094	75
3 842 528 718	64	3 842 541 566	251	3 842 546 660	191	3 842 547 095	75
3 842 528 721	64	3 842 541 567	251	3 842 546 661	191	3 842 547 096	75
3 842 528 724	64	3 842 541 888	251	3 842 546 662	191	3 842 547 097	75
3 842 528 727	64	3 842 541 889	251	3 842 546 663	191	3 842 547 098	75
3 842 528 772	251	3 842 541 902	253	3 842 546 670	55	3 842 547 099	75
3 842 528 773	251	3 842 541 903	253	3 842 546 672	55	3 842 547 100	75
3 842 528 817	264	3 842 543 246	251	3 842 546 673	55	3 842 547 101	75
3 842 528 852	260	3 842 544 875	121, 123	3 842 546 674	55	3 842 547 102	75
3 842 529 236	303	3 842 546 000	19	3 842 546 675	55	3 842 547 103	75
3 842 529 347	125	3 842 546 001	19	3 842 546 676	55	3 842 547 104	75
3 842 529 386	123	3 842 546 002	19	3 842 546 677	55	3 842 547 105	75
3 842 529 850	227	3 842 546 006	23	3 842 546 684	135	3 842 547 106	75
3 842 530 236	190	3 842 546 007	23	3 842 546 685	135	3 842 547 107	75
3 842 530 277	60	3 842 546 008	23	3 842 546 686	135	3 842 547 108	75
3 842 530 281	65	3 842 546 012	39	3 842 546 687	135	3 842 547 109	75
3 842 530 283	65	3 842 546 013	39	3 842 546 688	135	3 842 547 110	75
3 842 530 285	65, 234, 235	3 842 546 014	40	3 842 546 689	135	3 842 547 111	147
3 842 530 287	65, 213	3 842 546 015	37	3 842 546 700	135	3 842 547 112	147
3 842 531 552	255	3 842 546 016	37	3 842 546 705	55	3 842 547 113	147
3 842 532 151	295	3 842 546 017	27	3 842 546 706	135, 234, 235	3 842 547 114	147
3 842 532 259	303	3 842 546 018	27	3 842 546 707	135	3 842 547 115	147
3 842 532 762	273	3 842 546 019	28	3 842 546 717	122	3 842 547 116	147
3 842 532 980	256	3 842 546 020	31	3 842 546 718	122	3 842 547 117	147
3 842 532 998	256	3 842 546 021	24, 31	3 842 547 048	69	3 842 547 118	147
3 842 533 306	191	3 842 546 028	20, 21, 25	3 842 547 049	69	3 842 547 119	147
3 842 533 307	191	3 842 546 069	19	3 842 547 050	69	3 842 547 120	147
3 842 533 308	191	3 842 546 070	19	3 842 547 051	69	3 842 547 121	147
3 842 533 309	191	3 842 546 071	19	3 842 547 052	69	3 842 547 122	147
3 842 533 310	191	3 842 546 072	20	3 842 547 053	69	3 842 547 123	151
3 842 533 841	219, 227	3 842 546 073	20	3 842 547 054	69	3 842 547 124	151
3 842 533 901	191	3 842 546 074	21	3 842 547 055	69	3 842 547 125	151
3 842 533 915	139	3 842 546 075	19	3 842 547 056	69	3 842 547 126	151
3 842 533 921	303	3 842 546 076	19	3 842 547 057	69	3 842 547 127	151
3 842 535 001	281	3 842 546 077	23	3 842 547 058	69	3 842 547 128	151
3 842 535 002	281	3 842 546 078	23	3 842 547 059	69	3 842 547 129	151
3 842 535 003	281	3 842 546 079	23	3 842 547 060	71	3 842 547 130	151
3 842 535 004	281	3 842 546 080	24	3 842 547 061	71	3 842 547 131	151
3 842 535 081	253	3 842 546 082	25	3 842 547 062	71	3 842 547 132	151
3 842 535 150	283	3 842 546 083	27	3 842 547 063	71	3 842 547 133	151
3 842 535 801	273	3 842 546 084	27	3 842 547 064	71	3 842 547 134	151
3 842 536 295	230	3 842 546 085	28	3 842 547 065	71	3 842 547 135	153
3 842 536 787	255	3 842 546 086	47	3 842 547 066	71	3 842 547 136	153
3 842 538 208	228	3 842 546 087	47	3 842 547 067	71	3 842 547 137	153
3 842 538 209	228	3 842 546 088	199	3 842 547 068	71	3 842 547 138	153
3 842 538 388	227	3 842 546 089	199	3 842 547 069	71	3 842 547 139	153
3 842 538 389	227, 228	3 842 546 090	43	3 842 547 070	71	3 842 547 140	153
3 842 538 773	303	3 842 546 091	43	3 842 547 071	71	3 842 547 141	153
3 842 538 829	226	3 842 546 107	33	3 842 547 072	73	3 842 547 142	153
3 842 538 955	63	3 842 546 116	57, 62, 139, 143	3 842 547 073	73	3 842 547 143	153
3 842 538 957	63	3 842 546 120	81	3 842 547 074	73	3 842 547 144	153
3 842 539 339	236	3 842 546 121	81	3 842 547 075	73	3 842 547 145	153
3 842 539 340	228	3 842 546 122	81	3 842 547 076	73	3 842 547 146	153
3 842 539 344	236	3 842 546 123	81	3 842 547 077	73	3 842 547 147	153
3 842 539 345	228	3 842 546 124	81	3 842 547 078	73	3 842 547 148	153
3 842 539 494	234	3 842 546 125	81	3 842 547 079	73	3 842 547 149	153

3 842 547 150	153	3 842 548 877	63	3 842 553 035	203	3 842 558 078	107, 109, 179,
3 842 547 151	153	3 842 549 01583, 105, 161, 177		3 842 553 036	203	181	
3 842 547 152	153	3 842 549 01683, 105, 161, 177		3 842 553 037	205, 207	3 842 558 079	107, 109, 179,
3 842 547 153	153	3 842 549 017	105, 177	3 842 553 038	205, 207	181	
3 842 547 154	153	3 842 549 018	105, 177	3 842 553 047	81, 159	3 842 558 080	107, 109, 179,
3 842 547 155	153	3 842 549 365	191	3 842 553 048	81, 159	181	
3 842 547 156	153	3 842 549 388	301	3 842 553 049	81, 159	3 842 558 990	270
3 842 547 216	19, 20, 21, 23, 24, 25, 27, 28, 31, 37, 39, 40, 43, 45, 47, 199	3 842 549 727	57, 62, 139, 143	3 842 553 057	81, 159	3 842 559 108	103
		3 842 549 730	57, 62, 139, 143	3 842 553 058	81, 159	3 842 559 114	191, 213
		3 842 549 738	300	3 842 553 059	81, 159	3 842 559 115	191, 213
3 842 547 227	233	3 842 549 813	270	3 842 553 070	245	3 842 559 116	191
3 842 547 228	233	3 842 549 814	270	3 842 553 090	263	3 842 559 117	191
3 842 547 380	91	3 842 549 888	63	3 842 553 445	100, 173	3 842 559 118	191
3 842 547 381	91	3 842 551 044	255	3 842 553 447	99, 172	3 842 559 119	191
3 842 547 442	121	3 842 551 045	255	3 842 553 449	99, 172	3 842 559 126	75
3 842 547 443	121	3 842 551 074	287	3 842 553 450	99, 172	3 842 559 127	75
3 842 547 444	121	3 842 551 084	287	3 842 553 451	99, 172	3 842 559 128	75
3 842 547 445	125	3 842 551 086	287	3 842 553 452	99, 172	3 842 559 130	61
3 842 547 446	125	3 842 551 090	283	3 842 553 453	99, 172	3 842 559 135	260
3 842 547 447	125	3 842 551 091	283	3 842 553 454	99, 172	3 842 564 331	33
3 842 547 461	129	3 842 551 100	283	3 842 553 457	100, 173	3 842 572 961	270, 271
3 842 547 464	295	3 842 551 104	283	3 842 553 459	99, 172	3 842 990 350	121, 123
3 842 547 516	87	3 842 551 105	283	3 842 553 512	100, 173	3 842 990 351	213
3 842 547 517	87	3 842 551 108	287	3 842 553 518	301	3 842 992 476/...	255
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3 842 547 519	87	3 842 551 111	283	3 842 553 915	161, 205	3 842 993 306/L	219, 227
3 842 547 520	87	3 842 551 121	283	3 842 555 82083, 113, 161, 185		3 842 993 308	191
3 842 547 521	87	3 842 551 122	291	3 842 555 82183, 113, 161, 185		3 842 993 887/L	226
3 842 547 522	159, 205	3 842 551 124	291	3 842 555 822	113, 185	3 842 994 863/L	227
3 842 547 523	159, 205	3 842 551 125	291	3 842 555 823	113, 185	3 842 996 022/L	53
3 842 547 524	159	3 842 551 128	291	3 842 557 000	62, 143, 201	3 842 996 023/L	53
3 842 547 525	159	3 842 551 137	291	3 842 557 004	59, 141	3 842 996 024/L	53
3 842 547 526	159	3 842 551 138	287	3 842 557 005	255	3 842 996 026/L	55
3 842 547 527	159	3 842 551 139	287	3 842 557 025	300	3 842 996 027/L	135
3 842 547 528	165, 205	3 842 551 140	287	3 842 557 030	59, 141	3 842 996 028/L	55
3 842 547 529	165, 205	3 842 551 141	287	3 842 557 031	59, 141	3 842 996 029/L	135
3 842 547 530	165	3 842 551 545	69, 203	3 842 557 032	59, 141	3 842 996 204/...	252
3 842 547 531	165	3 842 551 546	69, 203	3 842 557 033	59, 141	3 842 996 205/...	252
3 842 547 532	165	3 842 551 547	69, 203	3 842 557 034	59, 141	3 842 996 314	137
3 842 547 533	165	3 842 551 548	69, 203	3 842 557 035	59, 141	3 842 998 291	81, 83, 85, 93,
3 842 547 703	247	3 842 551 549	69, 203	3 842 557 036	59, 141	159, 161, 163, 169, 205	
3 842 547 712	83	3 842 551 550	69, 203	3 842 557 037	59, 141	3 842 998 706/AZ	23
3 842 547 713	83	3 842 551 551	69, 203	3 842 557 051	149	3 842 998 707/AZ	23
3 842 547 727	19, 20, 21, 23, 24, 25, 27, 28, 31, 37, 39, 40, 43, 45, 47, 199	3 842 551 552	69, 203	3 842 557 052	149	3 842 998 708/AZ	23
		3 842 551 604	123	3 842 557 053	149	3 842 998 711/AZ	25
		3 842 551 761	270	3 842 557 054	149	3 842 998 712/AZ	39
3 842 547 729	219	3 842 552 821	101, 174	3 842 557 055	149	3 842 998 713/AZ	39
3 842 547 892	191	3 842 552 900	103	3 842 557 056	149	3 842 998 714/AZ	40
3 842 547 895	142	3 842 552 927	137, 142, 161	3 842 557 057	149	3 842 998 715/AZ	37
3 842 547 899	62	3 842 552 940	85, 163, 205	3 842 557 058	149	3 842 998 716/AZ	37
3 842 547 900	143	3 842 552 941	85, 163, 205	3 842 557 059	149	3 842 998 717/AZ	27
3 842 547 904	55	3 842 552 942	85, 163	3 842 557 060	149	3 842 998 718/AZ	27
3 842 547 905	135	3 842 552 948	211	3 842 557 061	149	3 842 998 719/AZ	28
3 842 547 906	135	3 842 552 950	241, 243	3 842 557 090	277	3 842 998 720/AZ	31
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