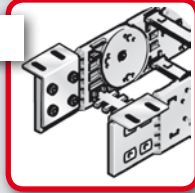


System overview

1

Chain bracket

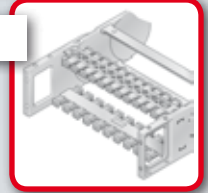
Chain bracket angle



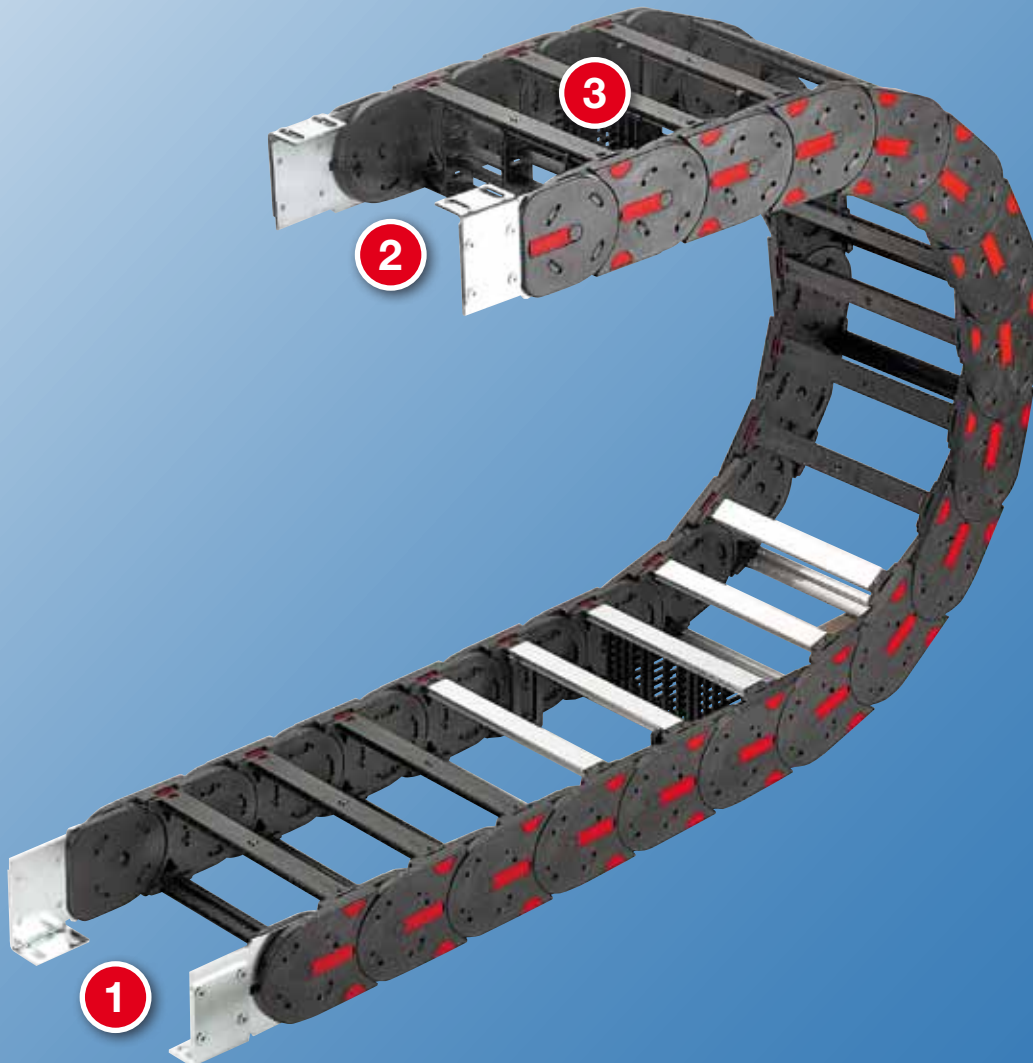
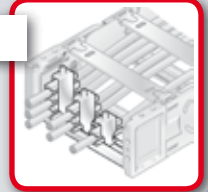
2

Strain relief

Frame bridge RS-ZL



STF Steel Fix

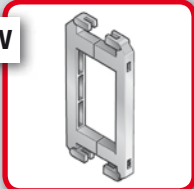


3 Shelving system

Separator TR



Frame bridge connector RSV



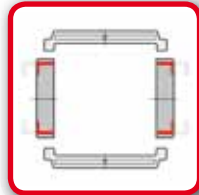
Guide channels

Aluminium VAW

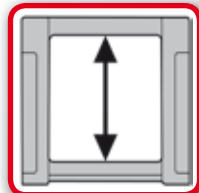
Stainless steel VAW-E



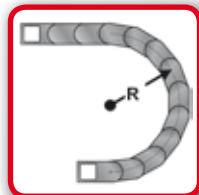
Technical data



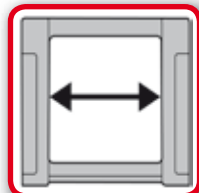
Loading side
inside and outside flexure curve



Available interior heights
104.0 mm



Available radii
250.0 – 500.0 mm



Available interior widths
118.0 – 518.0 mm
With aluminium frame bridge
118.0 – 600.0 mm

Ordering key

| Type | Variation | Dimensions | | | Ridge version | | Chain length mm |
|---------------------|-----------|--|--|--------------------------|-----------------------|-----------------|--------------------|
| | | Inside width mm | Outside width mm | Radius mm | | Material | |
| 1022 | 30 | 118 143 168 193 218 243 268 293 318 343 368 418 468 518 | 164 189 214 239 264 289 314 339 364 389 414 464 514 564 | 250 300 400 500 | 0 2 4 6 9 | 0 9 | |
| Ordering key | | [][][][] | [][][] | [][][] | [][] | [][][][][] | |

Note on configuration

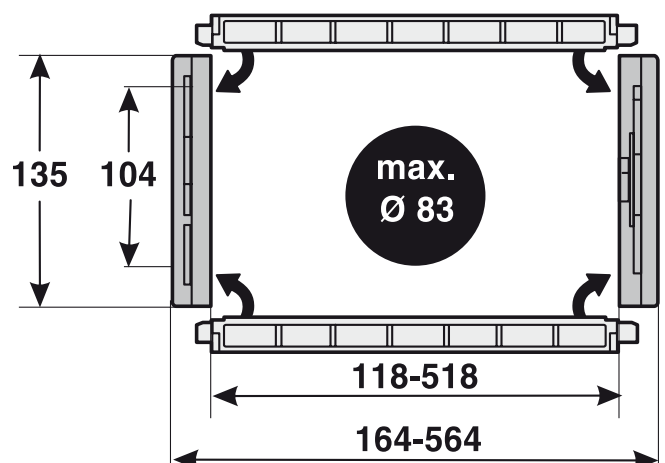
Frame bridges and cover from aluminium:
Aluminium frame bridges and covers can be supplied in 1 mm width sizes for inner widths from 118.0 mm – 600.0 mm.
If frame bridge strain relief plates (RS-ZL) are to be deployed, take standard widths into account.

Crossbar connector and frame bridge strain relief plate:
Once inner widths exceed 246 mm, we recommend the deployment of crossbar connectors (RSV).
Crossbar connectors cannot be used in conjunction with covers made from plastic or aluminium. If frame bridge strain relief plates (RS-ZL) are to be placed in the chain brackets, take the standard widths that can be supplied into account.

For detailed information, please consult the corresponding product documentation.

Chain link

Loading side: inside and outside flexure curve



Dimensions in mm

0 Standard (PA/black)
9 Special version

0 PA full-ridged with bias
2 PA half-ridged with bias
4 Aluminium full-ridged with bias
6 Aluminium half-ridged with bias
9 Special version

30 Frame bridge on outside of radius
Frame bridge on inside of radius
Opens on inside and outside of radius

Order sample: 1022 30 118 250 0 0 1974

Frame bridge in outside bend, frame bridge in inside bend, can be opened from inside and outside bend
Inside width 118 mm; radius 250 mm
Plastic bridge, full-ridged with bias, material black-coloured polyamide
Chain length 1974 mm (14 links)

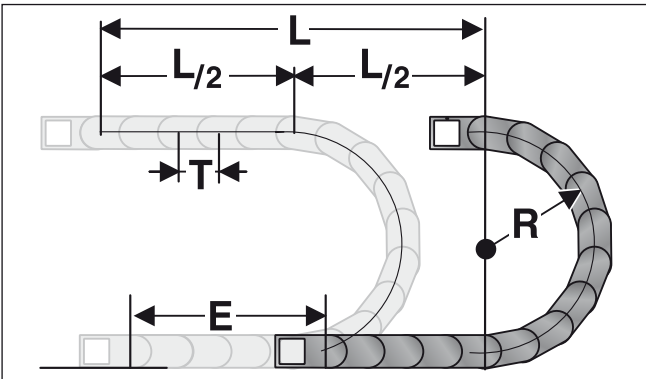
Technical specifications

| | |
|--|-----------------------|
| Travel distance gliding L_g max.: | 150.0 m |
| Travel distance self-supporting L_f max.: | see diagram |
| Travel distance vertical, hanging L_{vh} max.: | 80.0 m |
| Travel distance vertical, upright L_{vs} max.: | 8.0 m |
| Rotated 90°, unsupported L_{90f} max.: | 8.0 m |
| Speed, gliding V_g max.: | 5.0 m/s |
| Speed, self-supporting V_f max.: | 20.0 m/s |
| Acceleration, gliding a_g max.: | 25.0 m/s ² |
| Acceleration, self-supporting a_f max.: | 40.0 m/s ² |

Material properties

| | |
|---------------------------------------|----------------------|
| Standard material: | Polyamide (PA) black |
| Service temperature: | -30.0 – 120.0 °C |
| Gliding friction factor: | 0.3 |
| Static friction factor: | 0.45 |
| Fire classification: | Based on UL 94 HB |
| Other material properties on request. | |

Determining the chain length



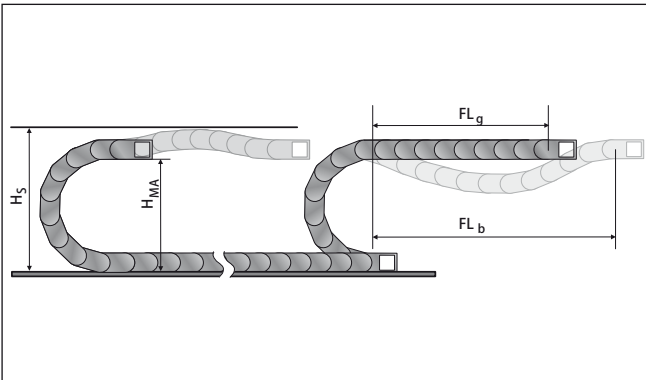
The fixed point of the cable drag chain should be connected in the middle of the travel distance. This arrangement gives the shortest connection between the fixed point and the moving consumer and thus the most efficient chain length.

$$\text{Chain length calculation} = L/2 + \pi * R + E$$

$$\approx 1 \text{ m chain} = 7 \text{ qty.} \times 141.0 \text{ mm links.}$$

E = distance between entry point and middle of travel distance
L = travel distance
R = radius
P = Pitch

Self-supporting length



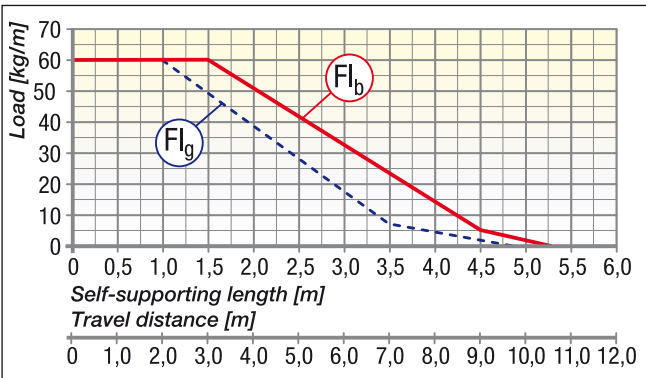
The self-supporting length is the distance between the chain bracket on the moving end and the start of the chain arch.

The installation variant FL_g offers the lowest load and wear for the cable drag chain.

The maximum travel parameters (speed and acceleration) can be applied for this variant.

H_S = Installation height plus safety
 H_{MA} = Height of moving end connection
 FL_g = Self-supporting length, upper run straight
 FL_b = Self-supporting length, upper run bent

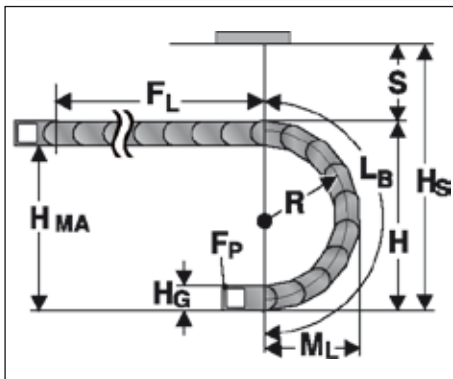
Load diagram for self-supporting applications



FL_g Self-supporting Length, upper run straight
In the FL_g range, the chain upper run still has a bias, is straight or has a maximum sag of

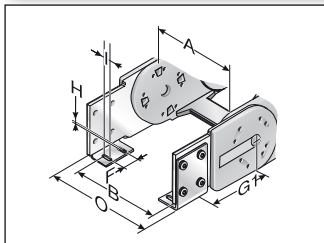
FL_b Self-supporting Length, upper run bent
In the FL_b range, the chain upper run has a sag of more than , but this is still less than the maximum sag. Where the sag is greater than that permitted in the FL_b range, the application is critical and should be avoided. The self-supporting length can be optimized by using a support for the upper run or a more stable cable drag chain.

Installation dimensions

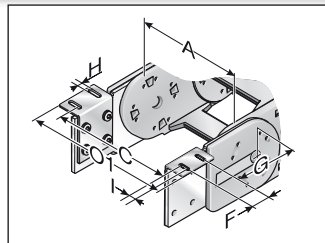


| Radius R | 250 | 300 | 400 | 500 |
|---|------|------|------|------|
| Outside height of chain link (H_o) | 135 | 135 | 135 | 135 |
| Height of bend (H) | 655 | 755 | 955 | 1155 |
| Height of moving end connection (H_{MA}) | 520 | 620 | 820 | 1020 |
| Installation height (H_i) | 705 | 805 | 1005 | 1205 |
| Safety margin without bias (S_k) | 50 | 50 | 50 | 50 |
| Installation height without bias (H_{SK}) | 705 | 805 | 1005 | 1205 |
| Arc projection (M_i) | 469 | 519 | 619 | 719 |
| Bend length (L_B) | 1169 | 1326 | 1640 | 1954 |

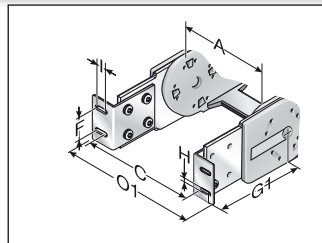
Chain bracket angle



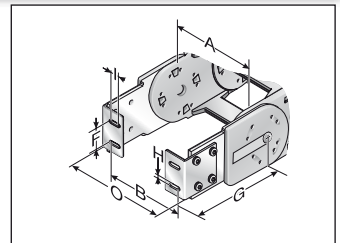
KA 102 (inside up / down)



KA 102 (outside up / down)



KA 102 (Front page exterior)

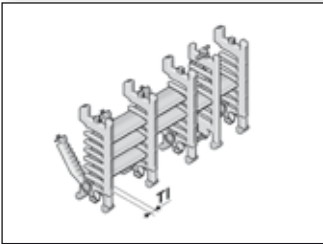


KA 102 (front page interior)

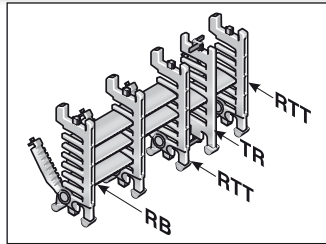
There are several options regarding the chain bracket. The fixed-point bracket (inside/bottom) and the moving end bracket (inside/top) are supplied as standard. However, any other combination can be supplied upon request. The chain bracket is fastened at the end like a side link. This enables the chain to move right up to the bracket. Each chain requires one male and one female bracket. The brackets should be fastened with M12 screws.

| Type | Order no. | Material | Inside width | | | | | | | H0 | I | Outside width KA 0 | Outside width KA 01 |
|---------------|------------|-------------|---------------|-------|--------|------|------|-------|------|------|--------|--------------------|---------------------|
| | | | A | B | C | F | G | G1 | mm | | | | |
| KA 102 male | 1020000050 | Sheet steel | 118.0 – 518.0 | A+2.0 | A+38.0 | 50.0 | 95.0 | 187.5 | 13.0 | 25.0 | A+28.0 | A+107.0 | |
| KA 102 female | 1020000051 | Sheet steel | 118.0 – 518.0 | A+2.0 | A+38.0 | 50.0 | 95.0 | 187.5 | 13.0 | 25.0 | A+28.0 | A+107.0 | |

Shelving system



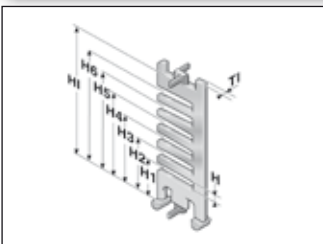
Shelving system



In connection with at least two shelf supports (RTT) the shelf becomes a shelving system. The additional levels prevent cables from criss-crossing and therefore destroying each other, while also avoiding excessive friction. The shelving system may be pre-assembled on request.

| Type | Order no. | Designation | Width mm | Pitch mm | Tl mm |
|----------|--------------|--------------------------|----------|----------|-------|
| RB 056-7 | 100000005600 | Shelf | 56.0 | 5.0 | |
| RB 066-7 | 100000006600 | Shelf | 66.0 | 5.0 | |
| RB 081-7 | 100000008100 | Shelf | 81.0 | 5.0 | |
| RB 106-7 | 100000010600 | Shelf | 106.0 | 5.0 | |
| RB 116-7 | 100000011600 | Shelf | 116.0 | 5.0 | |
| RB 166-7 | 100000016600 | Shelf | 166.0 | 5.0 | |
| RB 216-7 | 100000021600 | Shelf | 216.0 | 5.0 | |
| RTT 102 | 100091022000 | Shelf support, divisible | | 5.0 | 8.0 |

Separator



Separator

We recommend that separators be used if multiple round cables or conduits with differing diameters are to be installed. An offset configuration of the separators is advisable.

| Type | Order no. | Designation | Pitch mm | Tl mm | H mm | H1 mm | H2 mm | H3 mm | H4 mm | H5 mm | H6 mm | Hl mm |
|--------|------------|-------------|----------|-------|------|-------|-------|-------|-------|-------|-------|-------|
| TR 102 | 1020000092 | Separator | 5.0 | 4.0 | 5.5 | 27.4 | 39.7 | 52.0 | 64.3 | 76.6 | 88.9 | 104.0 |

Crossbar connector

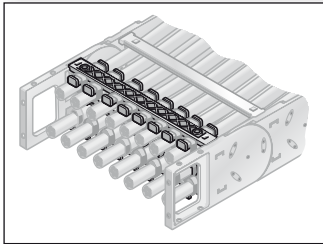


Crossbar connector

For frame bridges wider than 246 mm, we recommend the use of crossbar connectors. These prevent deformation to the frame bridge under large amounts of additional weight of the chain assembly.

| Type | Order no. | Designation | Tl mm |
|-------------|------------|--|-------|
| RSV 102 | 1020000096 | Crossbar connector | 8.0 |
| RSV 102 Alu | 1020000098 | Crossbar connector for aluminium frame bridges | 8.0 |

Frame bridge strain relief plate

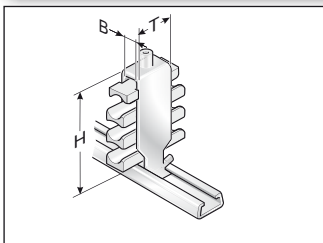


Frame bridge strain relief plate

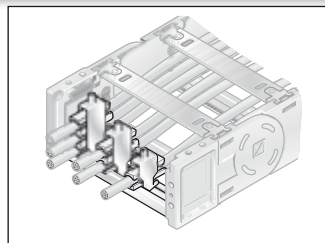
Fixed integrated frame bridge strain relief plates in the chain brackets. Accommodated to all widths of the frame bridges, up to 243 mm in size. May be assembled on the inside and outside flexure curves at both chain endings.

| Type | Order no. | Designation | For internal width mm |
|-------------|--------------|----------------------------------|-----------------------|
| RS-ZL 118-7 | 072011800010 | Frame bridge strain relief plate | 118.0 |
| RS-ZL 143-7 | 072014300010 | Frame bridge strain relief plate | 143.0 |
| RS-ZL 168-7 | 072016800010 | Frame bridge strain relief plate | 168.0 |
| RS-ZL 193-7 | 072019300010 | Frame bridge strain relief plate | 193.0 |
| RS-ZL 218-7 | 072021800010 | Frame bridge strain relief plate | 218.0 |

Strain relief



Strain relief with Steel Fix



Strain relief with Steel Fix

C-rails (cathodic dipped) for permanent integration, for accommodating the Steel Fix bow clamps in the chain brackets. The bow clamps can take up to 3 cables and are suitable for C-rails with a groove width of 11 mm. Due to the design of the trough elements a cable preserving cable guidance is ensured. Adjusted to all inside widths up to 200 mm. May be assembled on the inside and outside flexure curves at both chain endings. The entire height entered is a guide only. The actual height is,

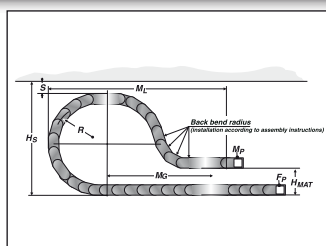
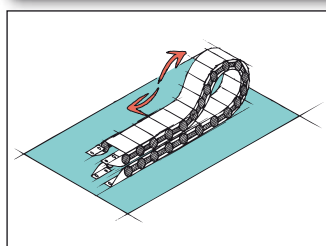
amongst other things, dependent on the diameter and the quality of the cable. A safety distance of 10 mm at the fixed point above the strain relief must be kept during gliding applications.

| Type | Order no. | Designation | Ø mm | Seats qty. |
|--------------------------------------|-----------|--------------|-------------|------------|
| Single clamp (for one cable) | | | | |
| STF 12-1 Steel Fix | 81661801 | Hooped clamp | 6.0 – 12.0 | 1 |
| STF 14-1 Steel Fix | 81661802 | Hooped clamp | 12.0 – 14.0 | 1 |
| STF 16-1 Steel Fix | 81661803 | Hooped clamp | 14.0 – 16.0 | 1 |
| STF 18-1 Steel Fix | 81661804 | Hooped clamp | 16.0 – 18.0 | 1 |
| STF 20-1 Steel Fix | 81661805 | Hooped clamp | 18.0 – 20.0 | 1 |
| STF 22-1 Steel Fix | 81661806 | Hooped clamp | 20.0 – 22.0 | 1 |
| STF 26-1 Steel Fix | 81661807 | Hooped clamp | 22.0 – 26.0 | 1 |
| STF 30-1 Steel Fix | 81661808 | Hooped clamp | 22.0 – 26.0 | 1 |
| STF 34-1 Steel Fix | 81661809 | Hooped clamp | 26.0 – 30.0 | 1 |
| STF 38-1 Steel Fix | 81661810 | Hooped clamp | 34.0 – 38.0 | 1 |
| STF 42-1 Steel Fix | 81661811 | Hooped clamp | 38.0 – 42.0 | 1 |
| Double clamp (for two cables) | | | | |
| STF 12-2 Steel Fix | 81661821 | Hooped clamp | 6.0 – 12.0 | 2 |
| STF 14-2 Steel Fix | 81661822 | Hooped clamp | 12.0 – 14.0 | 2 |
| STF 16-2 Steel Fix | 81661823 | Hooped clamp | 14.0 – 16.0 | 2 |
| STF 18-2 Steel Fix | 81661824 | Hooped clamp | 16.0 – 18.0 | 2 |

Strain relief (Continued...)

| Type | Order no. | Designation | Ø mm | Seats qty. |
|--|-----------|--------------|-------------|------------|
| STF 20-2 Steel Fix | 81661825 | Hooped clamp | 18.0 – 20.0 | 2 |
| STF 22-2 Steel Fix | 81661826 | Hooped clamp | 20.0 – 22.0 | 2 |
| STF 26-2 Steel Fix | 81661827 | Hooped clamp | 22.0 – 26.0 | 2 |
| STF 30-2 Steel Fix | 81661828 | Hooped clamp | 26.0 – 30.0 | 2 |
| STF 34-2 Steel Fix | 81661829 | Hooped clamp | 26.0 – 30.0 | 2 |
| Triple clamp (for three cables) | | | | |
| STF 12-3 Steel Fix | 81661841 | Hooped clamp | 6.0 – 12.0 | 3 |
| STF 14-3 Steel Fix | 81661842 | Hooped clamp | 12.0 – 14.0 | 3 |
| STF 16-3 Steel Fix | 81661843 | Hooped clamp | 14.0 – 16.0 | 3 |
| STF 18-3 Steel Fix | 81661844 | Hooped clamp | 16.0 – 18.0 | 3 |
| STF 20-3 Steel Fix | 81661845 | Hooped clamp | 18.0 – 20.0 | 3 |
| STF 22-3 Steel Fix | 81661846 | Hooped clamp | 20.0 – 22.0 | 3 |

Lowered fixing point



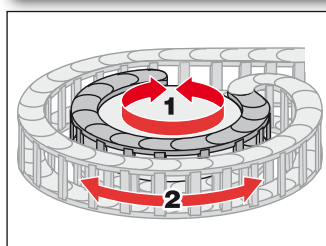
It is sometimes necessary to lower the height of the moving attachment point.

In such cases, modifications to the chain layout should be noted (e.g. extension of chain).

Please contact our application engineers.

| Radius R | Height of moving end connection | Safety margin | Installation height incl. safety | Projection | Additional links | of which additional back chain links |
|----------|---------------------------------|---------------|----------------------------------|----------------------|------------------|--------------------------------------|
| mm | (H _{MA}) mm | (S) mm | (H _S) mm | (M _L) mm | qty. | qty. |
| 250.0 | 250.0 | 60.0 | 695.0 | 880.0 | 9.0 | 3.0 |
| 300.0 | 270.0 | 60.0 | 795.0 | 1020.0 | 10.0 | 3.0 |
| 400.0 | 390.0 | 60.0 | 995.0 | 1220.0 | 12.0 | 3.0 |
| 500.0 | 420.0 | 60.0 | 1200.0 | 1490.0 | 15.0 | 3.0 |

Back radii

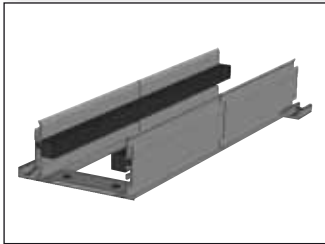


Rotating movement

Side links with radius forward (R) and radius backward (R_ü) allow for movement in two directions. This is intended for rotating movements and lowered chain brackets. Note: This type of chain has different chain links for the left or right side!

| Type | Order no. | Radius mm | Back radius mm |
|---------------------------|-------------|-----------|----------------|
| SR 102 (RÜ400/R400) left | 10200040060 | 400.0 | 400.0 |
| SR 102 (RÜ400/R400) right | 10200040062 | 400.0 | 400.0 |

Guide channels (VAW)



VAW

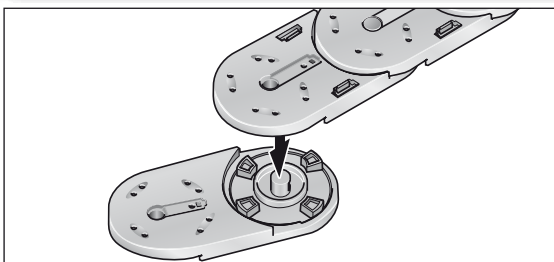
For this cable drag chain, a variable guide channel system is available, constructed from aluminium sections.

The variable guide channel ensures that the cable drag chain is supported and guided securely.

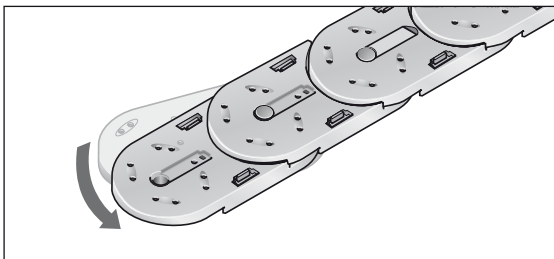
For help on choosing, please consult the chapter „Variable Guide Channel System“.

Assembly

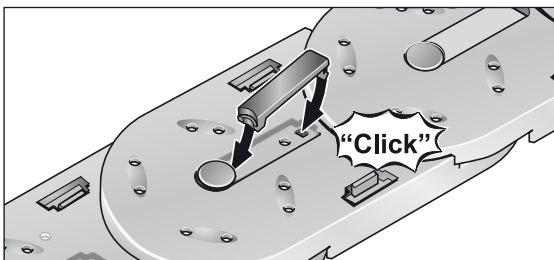
Disassembly



Step 1



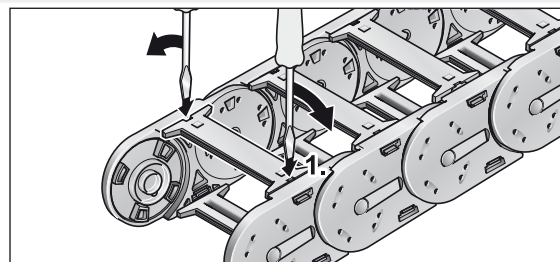
Step 2



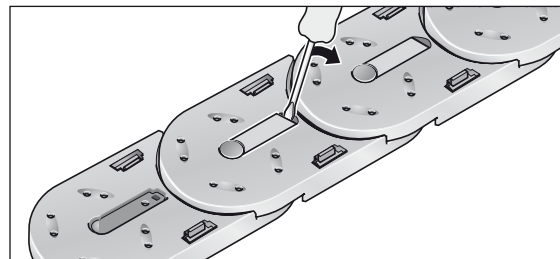
Step 3



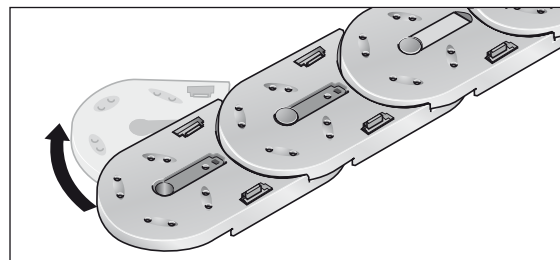
Step 4



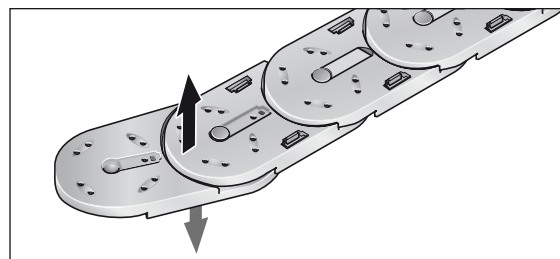
Step 1



Step 2



Step 3



Step 4