Cable drag chain systems

Catalogue overview

Contents

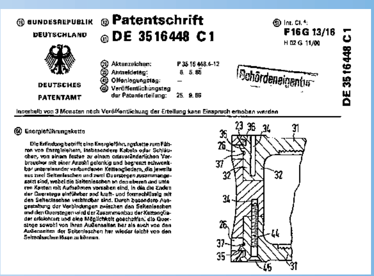
Variable guide channel systems 297–342

Strain relief systems 343–352

Appendix 353–370

Success doesn't happen overnight: 30 years of passion for innovation

1984



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Behördeneigentum

DE 3516448 C1

Innerhalb von 3 Monaten nach Veröffentlichung der Erteilung kann Einspruch erhoben werden

(54) Energieführungskette

Die Erfindung betrifft eine Energieführungskette zum Führen von Energieleitern, insbesondere Kabeln oder Schläuchen, von einem festen zu einem ortsveränderlichen Verbraucher mit einer Anzahl gelenkig und begrenzt schwenkbar untereinander verbundenen Kettengliedern, die jeweils aus zwei Seitenlaschen und zwei Querstegen zusammengesetzt sind, wobei die Seitenlaschen an den oberen und unteren Kanten mit Aufnahmen versehen sind, in die die Enden der Querstege einführbar und kraft- und formschlüssig mit den Seitenlaschen verbindbar sind. Durch besondere Ausgestaltung der Verbindungen zwischen den Seitenlaschen und den Querstegen wird der Zusammenbau der Kettenglieder erleichtert und eine Möglichkeit geschaffen, die Querstege sowohl von ihren Außenseiten her als auch von den Außenseiten der Seitenlaschen her wieder leicht von den Seitenlaschen lösen zu können.

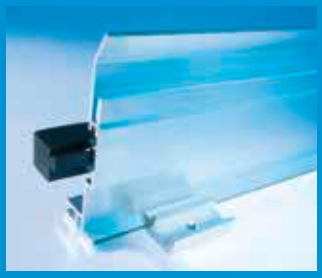
1987

1988

1994

1984	First Cable drag chain that can be opened
1987	Frame bridges pivotable on both sides
1988	Bayonet stop system
1994	Integrated strain relief plates
1994	Guide channel system with releasable connecting glide rails
1995	PowerLine shelving system for optimised chain windows
1996	Centre piece for guide channel systems aligned in parallel
1997	Guide channel system with multiple grooves
1998	Crossbar connectors, for greater stability with large chain widths
2001	PowerLine second Generation
2003	Magnet chain technology for contactless gliding
2005	MultiLine series
2007	Brush supports for optimum cable positioning in the neutral strand
2008	ModulLine series
2011	Bracket bars for integration of large-diameter media conduits into a cable drag chain system

1994

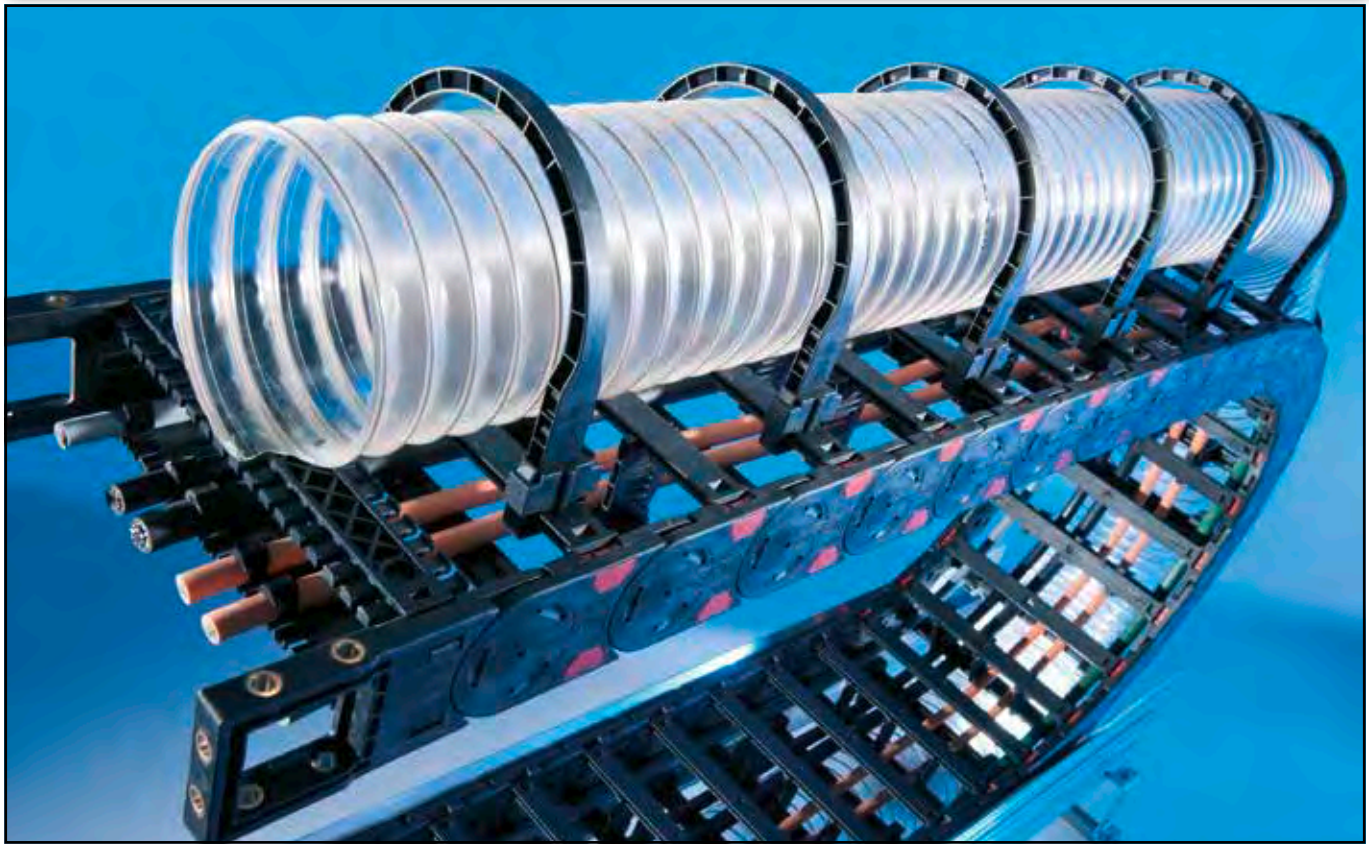


2003

2007

2011

Extender frame bridge



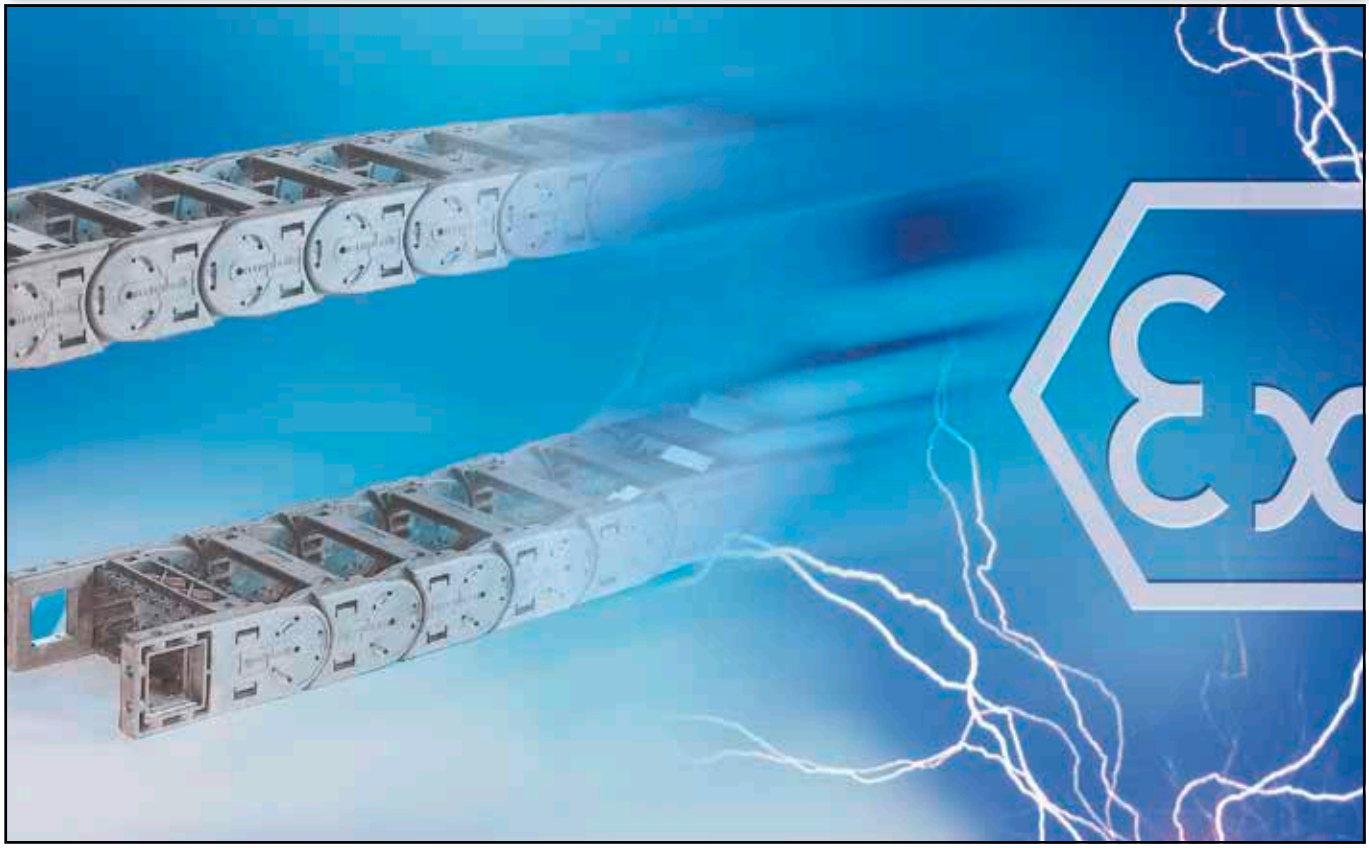
Extender frame bridge

Large-diameter conduits are routed securely by using bracket bars. These bracket bars can be supplied in various sizes.

Mounting is either on the frame bridges or on the closed cover. Thanks to the modular design, retrofitting bracket bars is also possible at any time.

- ✔ **Modular system**
- ✔ **For frame bridges and covers**
- ✔ **Can be supplied in a range of sizes**
- ✔ **Can be retrofitted**

Atex chains



Safety based on ATEX EX II 2GD

Since July 2003, all equipment, components and protective systems used in explosion hazard areas must comply with the ATEX Product Directive 94/P/EC.

Murrplastik ESD cable drag chains have a high discharge capability and are used in explosion hazard areas and clean rooms.

Our cable drag chains are entitled to carry the following labelling:
EX II 2GD

With our certified chains there is no danger of being the weakest link!

- **Full ATEX EX II 2GD certification**
- **Murrplastik assumes liability**
- **Simple to exchange Certification still stands**
- **For areas at risk of explosion 1, 2, 21, 22**

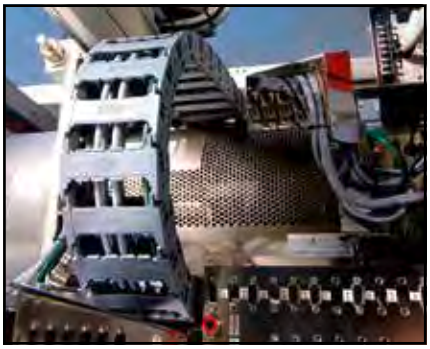
Clean room chains

Application in sensitive clean room environments

Clean room cable drag chains from Murrplastik Systemtechnik are produced using special materials. The cable drag chains offer premiere clean room properties. With minimal abrasion, and hence particle purity, as well as outstanding discharge of electromagnetic currents, these cable drag chains set new standards.

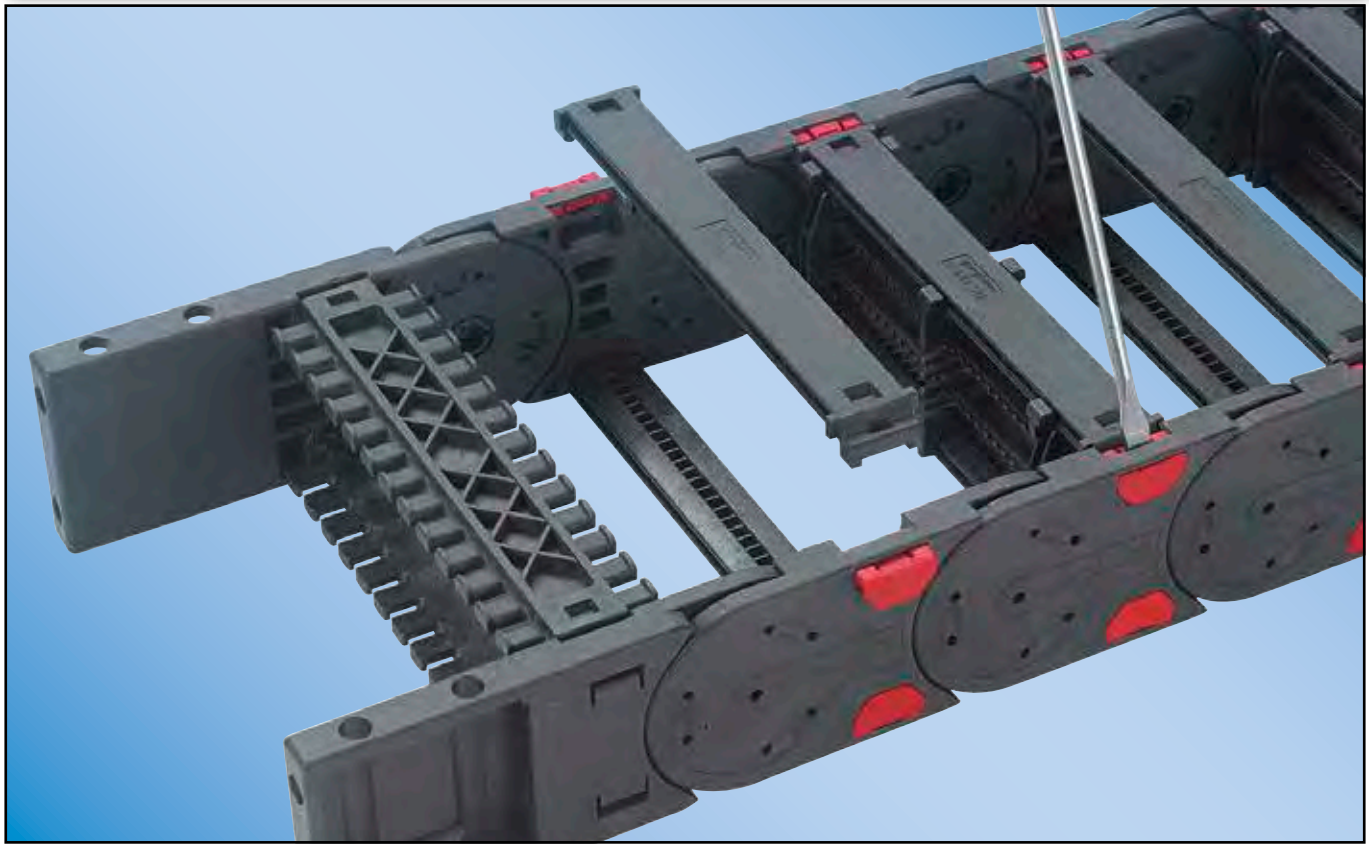
The discharge capacity complies with ATEX Product Directive 94/9/EC. Both characteristics, the discharge capacity and abrasion, have been tested and verified by respected institutions.

In spite of the outstanding discharge and abrasion properties, Murrplastik nevertheless refused to compromise in the slightest when it comes to functionality, reliability and easy of assembly.



- **Clean room classification by Fraunhofer-Institut (IPA)**
- **Fulfils the ATEX Europe guidelines**
- **Uncompromising functionality**
- **Unflinching reliability**

Click lock



Click – and you're done

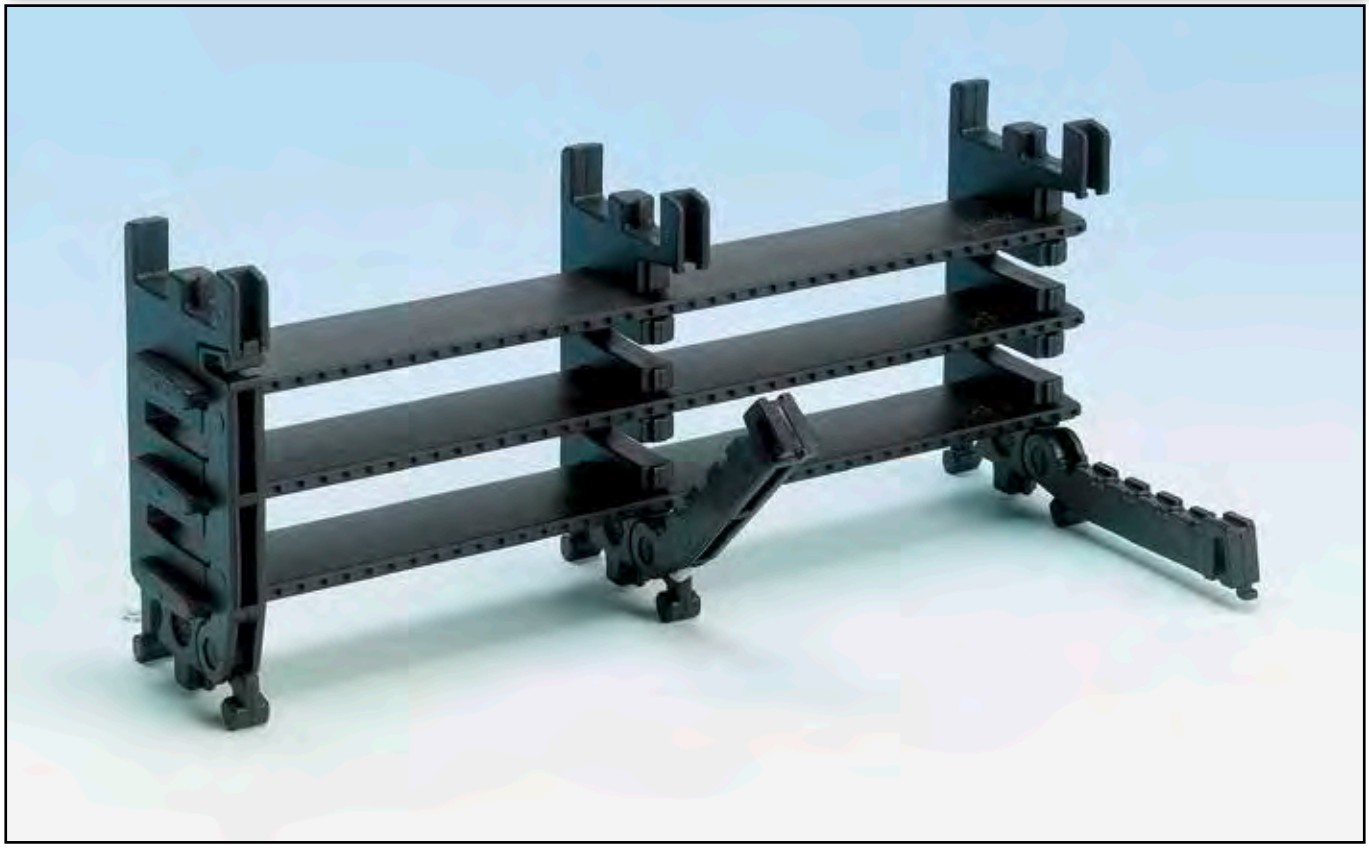
Fast and easy

The frame bridges can be fitted and removed quickly and with very little effort. Position the screwdriver between side link and frame bridge and slightly turn it to open the click lock. Retrofitting a cable in the cable drag chain is also a quick and simple task. Assembly is even simpler. Position the frame bridge in the side links and lock the click lock by hand.

With the click lock it is child's play. Fitting and removal are rarely quicker or simpler without compromising stability.

- ✔ **Quick assembly: click and go!**
- ✔ **REFA time and motion study conducted**
- ✔ **Assembly without tools**
- ✔ **Easy assembly**
- ✔ **Incredibly simple to retrofit cables**

Flexible shelving system



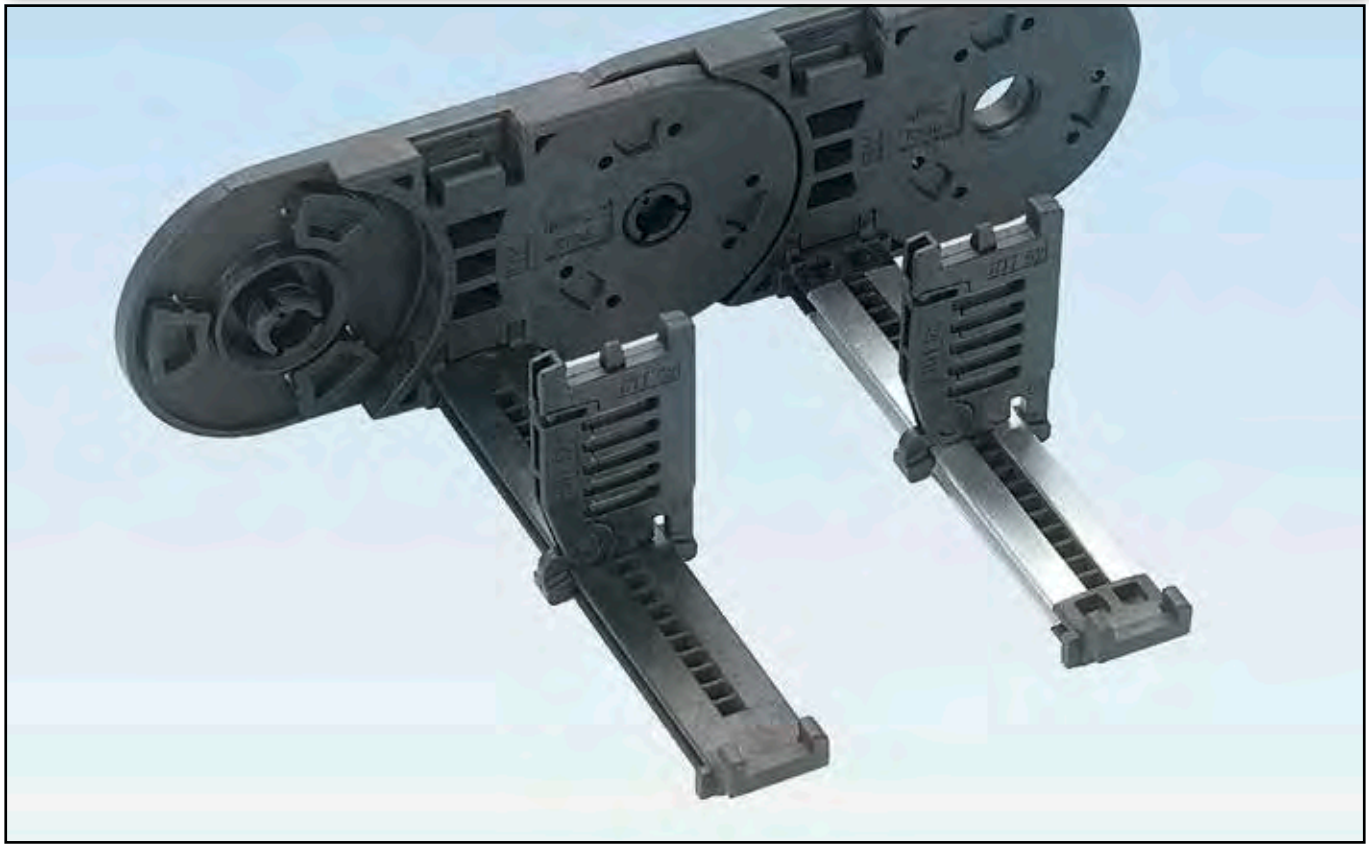
Extremely variable

Populating the chain with cables is made simpler by using separable shelf supports.

The multitude of combination options means that the perfect shelving system can be put together for any application.

The shelf separators lock firmly into the frame bridges and, once in place, they cannot slip. No matter what type of installation – horizontal, backwards, etc. – the cables stay in the position that was originally intended. This means: a long service life and no uneven wear to the chain.

- ✔ **Easy assembly**
- ✔ **REFA time and motion study conducted**
- ✔ **Lockable separator, fixed position**
- ✔ **Rapid assembly**
- ✔ **Modifications possible when installed**



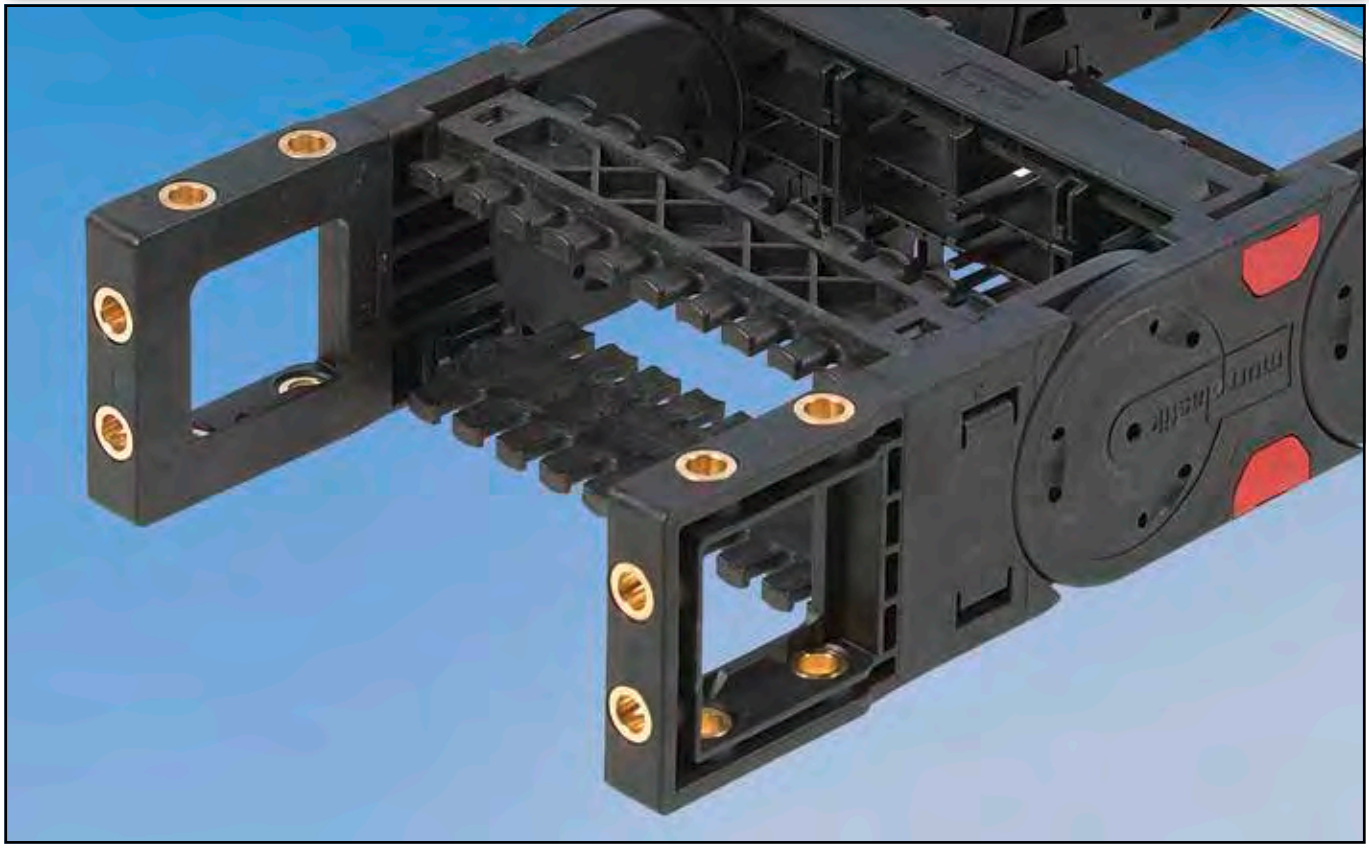
Variable frame bridges/covers

Variable:
Frame bridges/covers come in two alternative versions: plastic or aluminium. The plastic version is standard for frame bridges and can be supplied in a range of widths. The aluminium version can be supplied in any width.

Fixed:
In both the plastic and the aluminium versions, the separators lock into the frame bridge/cover and are thus fixed in place. The separators remain in their original position regardless of the type of installation and any chain movement. The frame bridges and separators form a stable unit.

- ✔ **Flexible adjustment due to closely spaced lock tabs**
- ✔ **Fixed with lock tabs**
- ✔ **Variable length**
- ✔ **Extremely stable**

Chain bracket



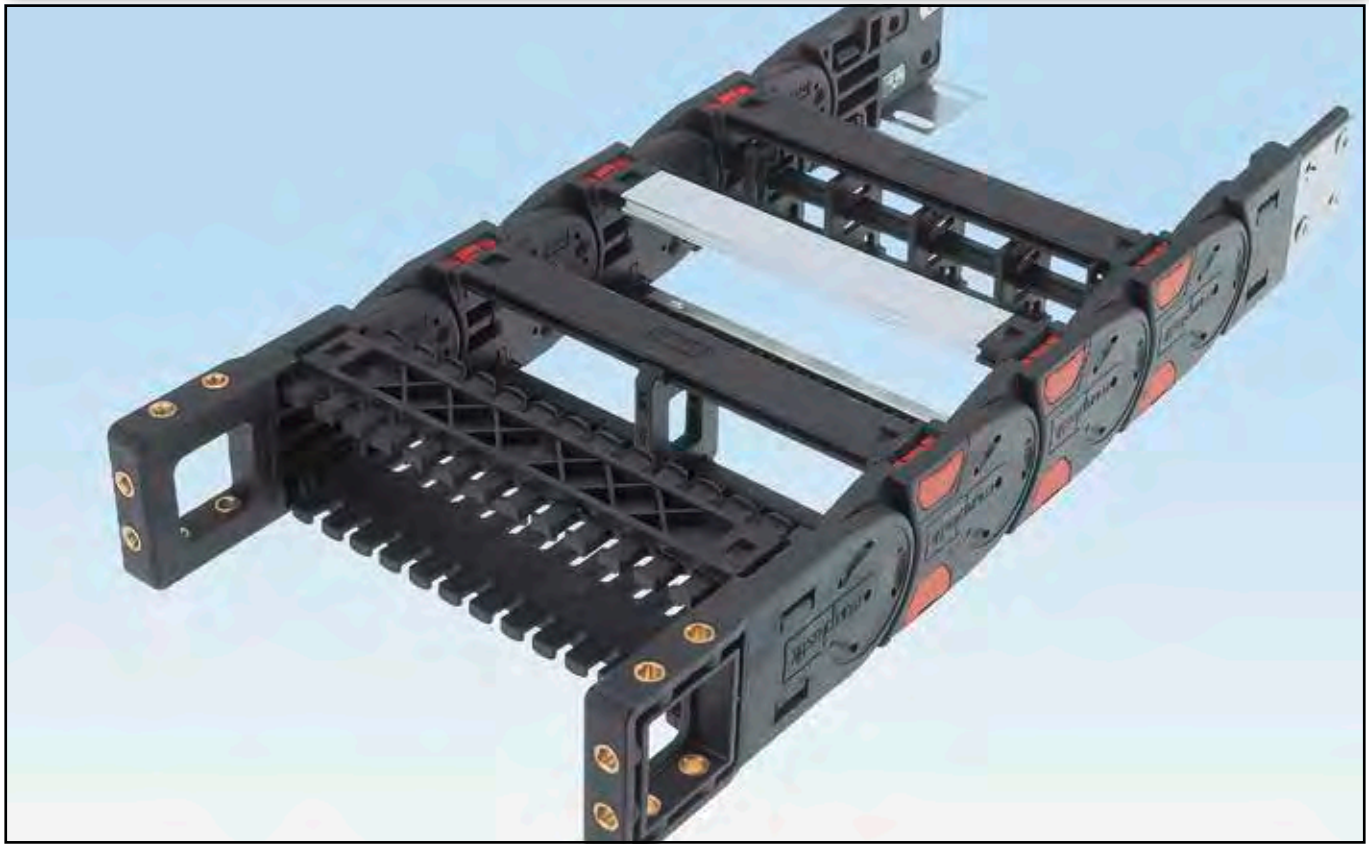
The best connections

Simply and quickly assembled:
Metal bushes are injected permanently into the plastic in the chain bracket. There are two different types: a threaded bush and a normal one.

Both types of bush inhibit cold flow properties during screwing, thus effecting an extremely good fit. The threaded bush is screwed directly without a nut.

- ✔ **No cold flow deformation**
- ✔ **Quick**
- ✔ **Secure fastening**
- ✔ **Compact**

Integrated strain relief



Economic with time and space

Simple and safe strain relief

No cumbersome special design for cable strain relief. Everything is quick and safe with the Murrplastik cable drag chain system.

Special strain relief frame bridges are used on the chain bracket. The strain relief is effected by cable ties. The cable can be fixed on the strain relief plate on two sides.

This integrated strain relief system is very quick to assemble and is extremely economical on space.

Steel Fix bow clamps are mounted on the C-rail integrated into the chain bracket. This strain relief mechanism is impressively easy to fit and very secure. One Steel Fix bow clamp can provide strain relief for up to three cables.

- ✔ **Easy to assemble**
- ✔ **Compact design**
- ✔ **Economical**
- ✔ **Saves space**
- ✔ **Secure strain relief**

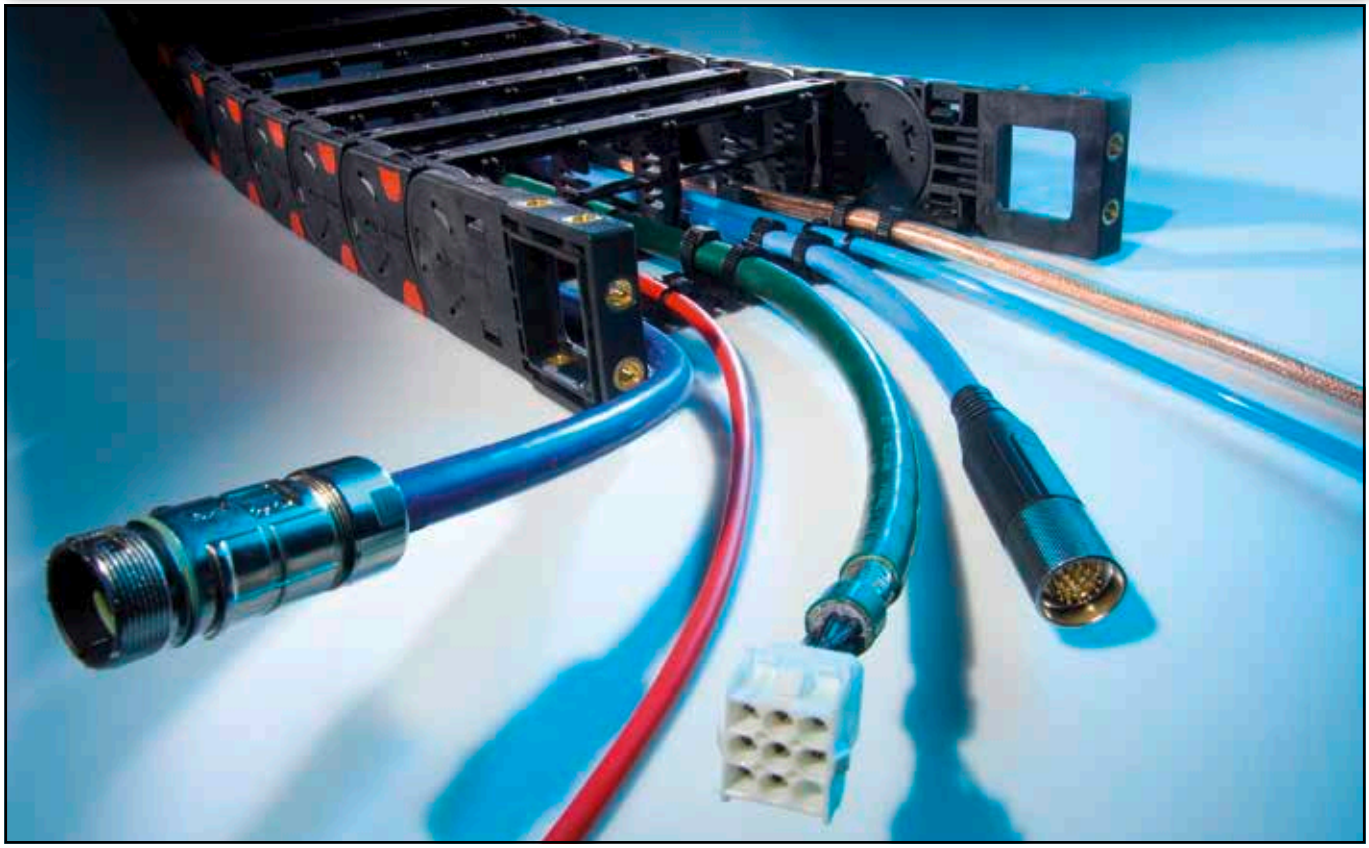
VAW guide channels

For maximum speed assembly

The VAW variable guide channel system is harmonised for Murrplastik cable drag chains. A range of different applications requires a range of different materials. This is why the VAW is offered in zinc-plated steel, stainless steel, plastic or aluminium.

Assembly is quick and easy:
Clamping pieces are used to secure the guide channels to C-rails.

- ✔ **Quick and easy assembly**
- ✔ **High quality**
- ✔ **Highly economical**
- ✔ **Tailored system**
- ✔ **Long service life**



Assembly

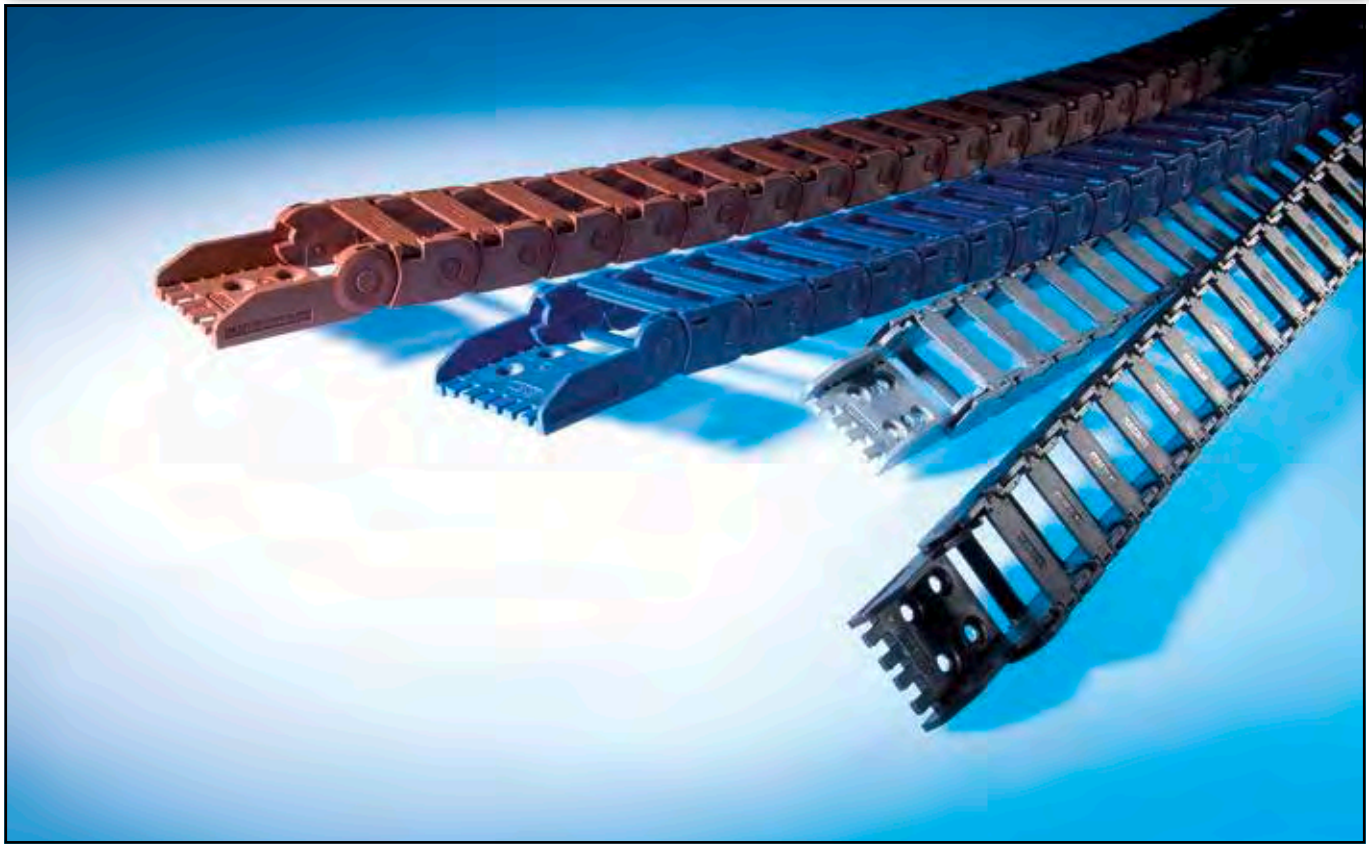
Everything from one source

Reduce your labour costs and save time by taking advantage of our experience in chain systems gained over many years.

At the customers request we assemble complete cable drag chains with cables. We handle the layout, assembly and ordering of individual components. The customer is supplied with a complete assembly kit that only needs to be fitted.

Thanks to our experience of cable drag chains and cables acquired over many years, we can combine both elements in one system. This guarantees a long service life.

- ✔ **System guarantee**
- ✔ **Easy handling**
- ✔ **Saves time and hassle when ordering**
- ✔ **Reduced warehousing costs**



Visual differentiation

Extreme areas of application require different materials.

The Murrplastik colour coding system enables you to recognise and classify different materials and hence areas of application safely and easily.

Clear assignments, safe use – as with all Murrplastik products.

- ✔ **Murrplastik colour coding system**
- ✔ **Black cable drag chains: Polyamide (PA): standard**
- ✔ **Light grey cable drag chains: Polyamide (PA): ESD model**
- ✔ **Oxide red cable drag chains: Polyamide (PA), UL 94/V0**
- ✔ **Blue cable drag chains: Polypropylene (PP)**

Selection criteria for cable drag chains

Ideayll, the design of a cable drag chain system will take the following criteria into account:

- Determine the number and outside diameter of the cables or conduits to be laid
- For self-supporting applications, the diagram “self-supporting length” can be used to identify the matching chain using load and travel distance
- Determine width of cable drag chain, design shelving system (separators, shelves, etc.)
- Determine the minimum possible bending radius of cabling and conduits, as per manufacturer specifications, and select the matching bending radius for the cable drag chain
- Determine chain length respective to the travel distance and the selected bending radius. (Using a formula – see matching cable drag chain types)
- Check whether a guide channel is required for the application. For gliding applications, a guide channel is always required

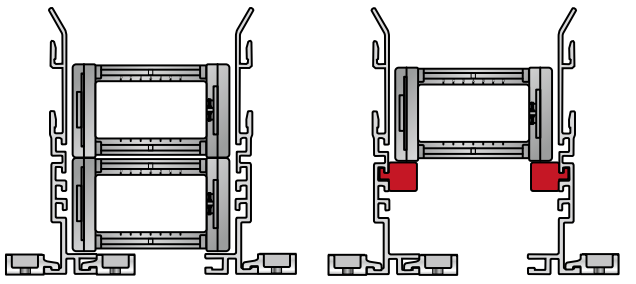
Self-supporting lengths and travel distances

If the travel distance is too long for self-supporting installation, the chain upper run rests on the chain lower run (the upper run glides over the lower run). We describe this system as a “gliding” type of installation.

With gliding installations, we recommend setting the chain bracket at the moving end lower, depending on the chain type and bending radius.

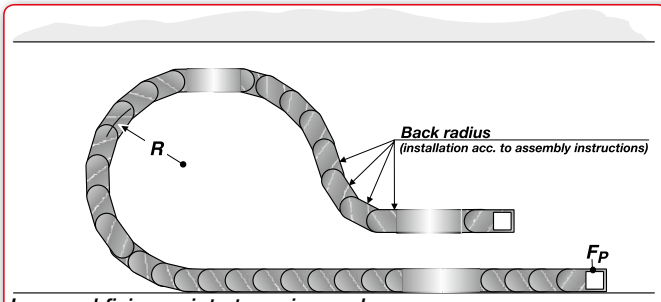
Please contact us: we will be very happy to help you design your cable drag chain project.

For further information, please consult our “Manual for the design and assembly of cable drag chain systems”, order no. 8902804550.

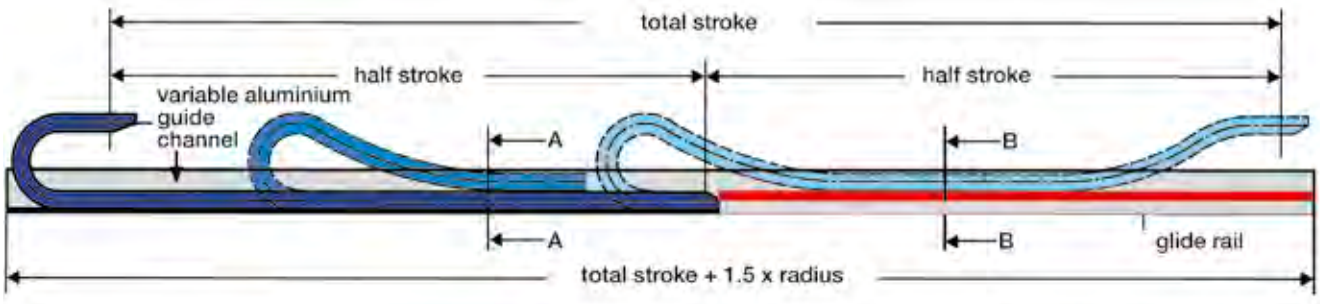


Cross-section A–A: *The cable drag chain runs on itself.*

Cross-section B–B: *The cable drag chain runs on the glide rail.*

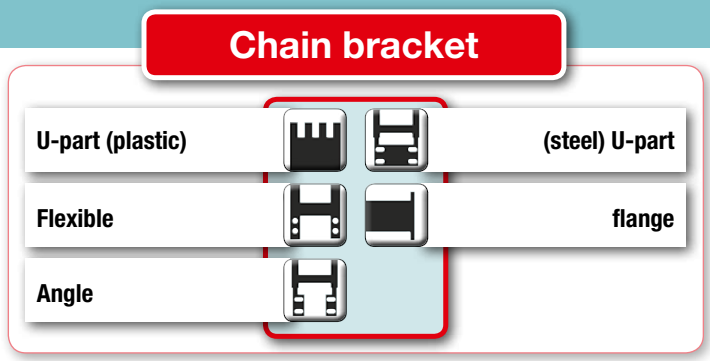


Lowered fixing point at moving end:
installation of chain links with rear-facing bending radius



VAW longitudinal cross-section: *The gliding behaviour of the cable drag chain over the entire travel distance.*

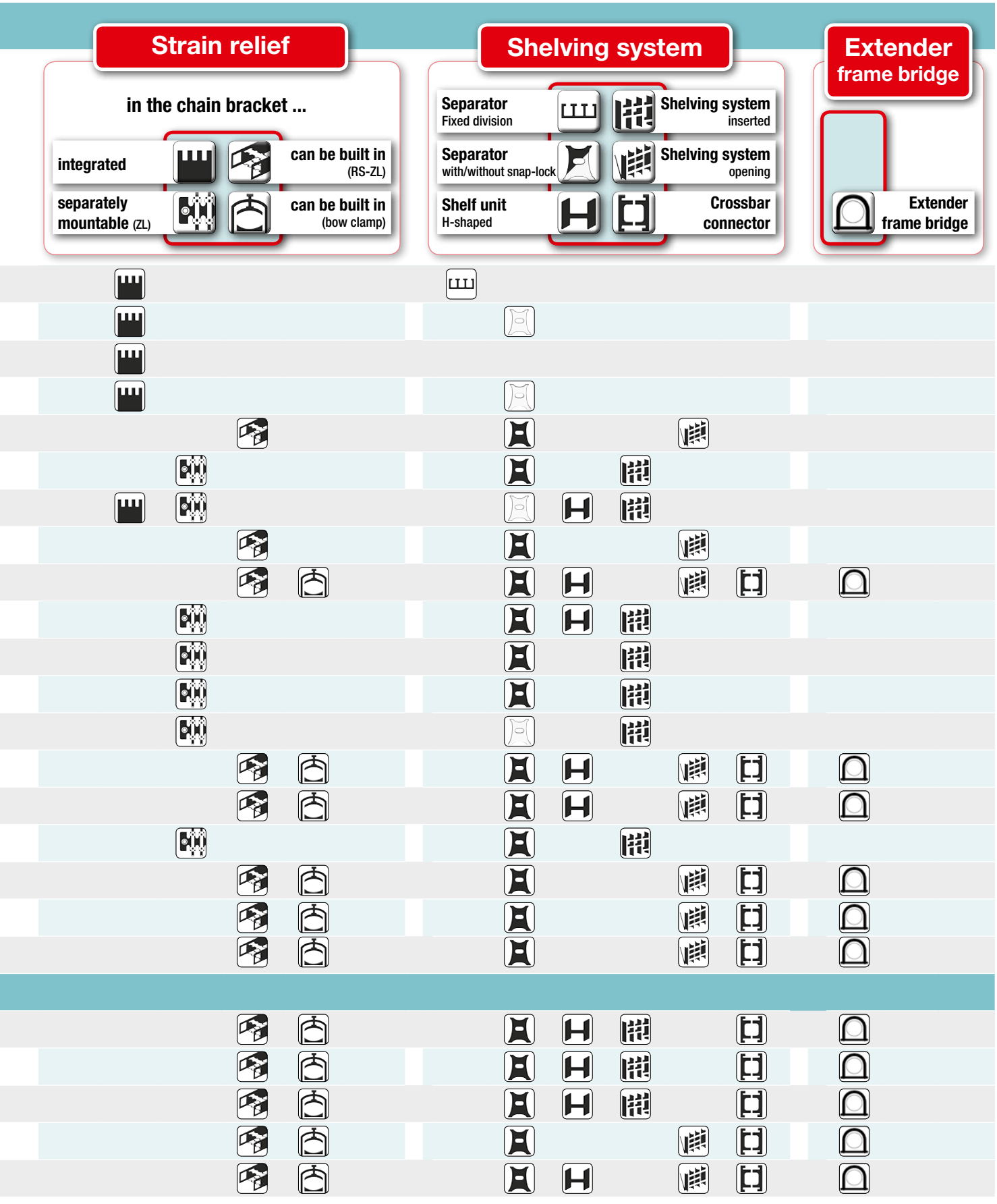
Features for series types



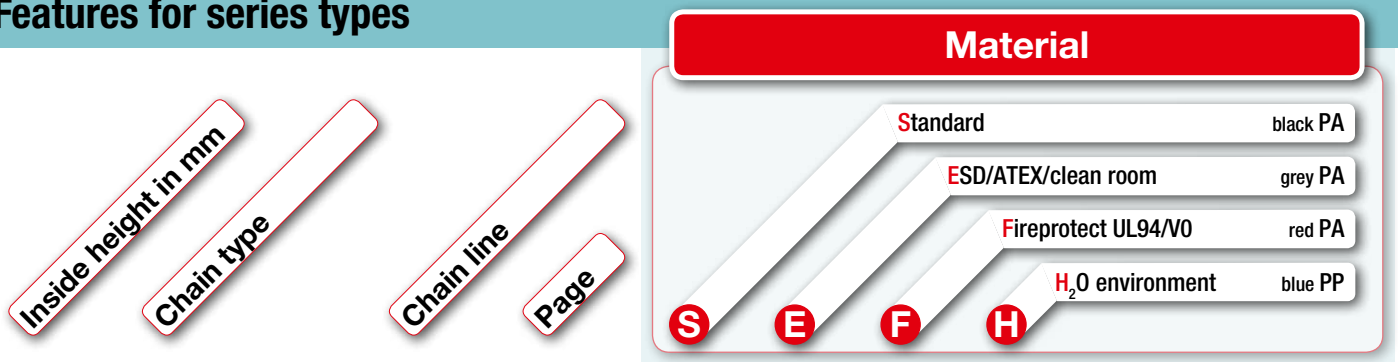
Inside height in mm	Chain type	Chain line	Page
10	MP 10.1	*EasyLine*	46
14	MP 14	*MultiLine*	54
14	MP 15	*MultiLine*	62
18	MP 18.1 / MP 18.2	*MultiLine*	70
25	MP 25	*ModulLine*	140
25	MP 25 G	*MultiLine*	78
26	MP 3000	*MultiLine*	86
30	MP 30	*ModulLine*	152
32/30	MP 32.2 / MP 32.3	*PowerLine*	164
34	MP 35	*MultiLine*	96
36	MP 36 G	*MultiLine*	106
38	MP 43 G	*MultiLine*	114
40	MP 44	*MultiLine*	122
42/38	MP 41.2 / MP 41.3	*PowerLine*	176
52/48	MP 52.2 / MP 52.3	*PowerLine*	190
60/60	MP 66 / MP 65 G	*MultiLine*	130
62/62	MP 62.2 / MP 62.3	*HeavyLine*	204
82/74	MP 82.2 / MP 82.3	*HeavyLine*	216
102	MP 102.2	*HeavyLine*	228

Murrplastik legacy product features *(do not use for new-build projects)*

32	MP 32		238
42	MP 41		250
52	MP 52.1		262
62	MP 62.1		274
72	MP 72		286


Strain relief
in the chain bracket ...
integrated
can be built in
(RS-ZL)
separately
mountable (ZL)
can be built in
(bow clamp)
Shelving system
Separator
Fixed division
Shelving system
inserted
Separator
with/without snap-lock
Shelving system
opening
Shelf unit
H-shaped
Crossbar
connector
Extender
frame bridge
Extender
frame bridge

Features for series types

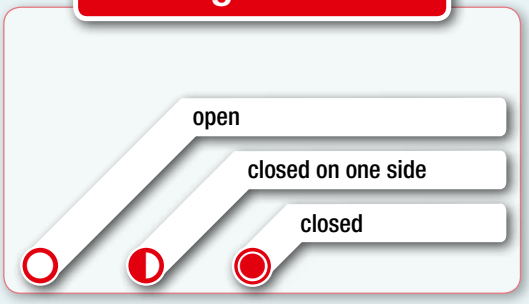


Inside height in mm	Chain type	Chain line	Page	S	E	F	H
10	MP 10.1	*EasyLine*	46	S	E	F	
14	MP 14	*MultiLine*	54	S			
14	MP 15	*MultiLine*	62	S	E	F	
18	MP 18.1 / MP 18.2	*MultiLine*	70	S	E	F	H
25	MP 25	*ModulLine*	140	S			
25	MP 25 G	*MultiLine*	78	S	E		
26	MP 3000	*MultiLine*	86	S	E	F	H
30	MP 30	*ModulLine*	152	S			
32 / 30	MP 32.2 / MP 32.3	*PowerLine*	164	S	E		H
34	MP 35	*MultiLine*	96	S			
36	MP 36 G	*MultiLine*	106	S			
38	MP 43 G	*MultiLine*	114	S			
40	MP 44	*MultiLine*	122	S			
42 / 38	MP 41.2 / MP 41.3	*PowerLine*	176	S	E		H
52 / 48	MP 52.2 / MP 52.3	*PowerLine*	190	S	E		H
60 / 60	MP 66 / MP 65 G	*MultiLine*	130	S			
62 / 62	MP 62.2 / MP 62.3	*HeavyLine*	204	S	E		H
82 / 74	MP 82.2 / MP 82.3	*HeavyLine*	216	S	E		H
102	MP 102.2	*HeavyLine*	228	S			

Murrplastik legacy product features *(do not use for new-build projects)*

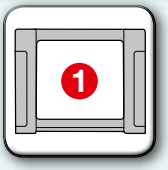
32	MP 32		238	S			
42	MP 41		250	S			
52	MP 52.1		262	S			
62	MP 62.1		274	S			
72	MP 72		286	S			

Bridge variant

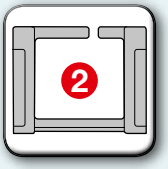


Opening variant

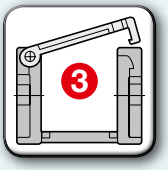
○			2		
○			4		
○			1		
○			3	4	
○	◐	●	5	6	
		●	4		
○			5		
○	◐	●	5	6	
○	◐	●	9		
○			7		
		●	3		
		●	8		
○			8		
○	◐	●	9		
○	◐	●	9		
○		●	8		
○	◐	●	9		
○	◐	●	9		
○			9		
○			8		
○			8		
○			8		
○			8		
○			8		



No opening

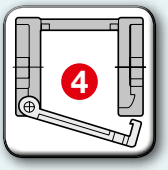


Slitted



Inside bend foldable on one side

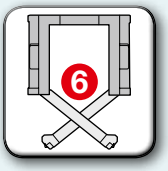
Note: Not recommended for gliding applications



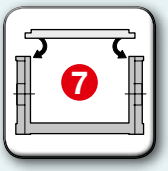
Outside bend foldable on one side

Inside bend foldable on both sides

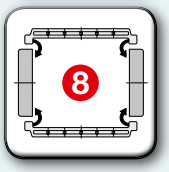
Note: Not recommended for gliding applications



Outside bend foldable on both sides



Inside bend engages seamlessly



Inside and outside bend engage

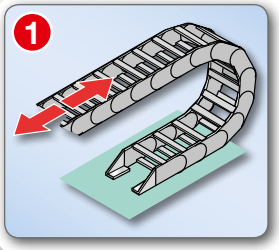
Inside and outside bend with snap-locking

Technical data, series types

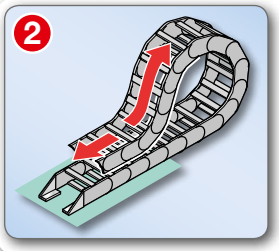
Inside height in mm	Chain type	Chain line	Page	Inside width: PA bars/covers in mm, from – to	Inside width: Al bars/covers in mm, from – to	Bending radius: Bending radii in mm, from – to
10	MP 10.1	*EasyLine*	46	6 – 41	–	18 – 58
14	MP 14	*MultiLine*	54	16 – 40	–	25 – 75
14	MP 15	*MultiLine*	62	16 – 40	–	25 – 75
18	MP 18.1 / MP 18.2	*MultiLine*	70	15 – 70	–	28 – 78
25	MP 25	*ModulLine*	140	40 – 200	–	50 – 300
25	MP 25 G	*MultiLine*	78	26 – 125	–	60 – 250
26	MP 3000	*MultiLine*	86	26 – 125	–	50 – 300
30	MP 30	*ModulLine*	152	40 – 200	–	60 – 300
32 / 30	MP 32.2 / MP 32.3	*PowerLine*	164	45 – 546	45–600 / 96–600	80–250 / 120–250
34	MP 35	*MultiLine*	96	62 – 150	–	70 – 300
36	MP 36 G	*MultiLine*	106	62 – 125	–	80 – 200
38	MP 43 G	*MultiLine*	114	62 – 182	–	125 – 250
40	MP 44	*MultiLine*	122	45 – 182	70 – 600	90 – 250
42 / 38	MP 41.2 / MP 41.3	*PowerLine*	176	45 – 546	80–600 / 96–600	75–300 / 150–300
52 / 48	MP 52.2 / MP 52.3	*PowerLine*	190	45 – 546	80–600 / 96–600	100–350 / 150–350
60 / 60	MP 66 / MP 65 G	*MultiLine*	130	45–182 / 84–144	70–600 / n/a	150–350 / 200–350
62 / 62	MP 62.2 / MP 62.3	*HeavyLine*	204	118 – 518	118 – 600	150–500 / 200–500
82 / 74	MP 82.2 / MP 82.3	*HeavyLine*	216	118 – 518	118 – 600	150–500 / 200–500
102	MP 102.2	*HeavyLine*	228	118 – 518	118 – 600	250 – 500
Murrplastik legacy product features *(do not use for new-build projects)*						
32	MP 32		238	45 – 546	80 – 600	80 – 250
42	MP 41		250	45 – 546	80 – 600	75 – 300
52	MP 52.1		262	45 – 546	80 – 600	100 – 350
62	MP 62.1		274	118 – 518	118 – 600	150 – 500
72	MP 72		286	118 – 518	118 – 600	150 – 500

Travel distance		Speed		Acceleration	
					
max. travel distance in m self-supporting	max. travel distance in m gliding	max. speed of travel in m/s self-supporting	max. speed of travel in m/s gliding	max. acceleration in m/s² self-supporting	max. acceleration in m/s² gliding
1.0	10.0	4.0	2.0	2.0	2.0
2.0	12.0	4.0	2.0	2.0	2.0
2.0	12.0	4.0	2.0	2.0	2.0
3.0	20.0	5.0	2.0	5.0	5.0
4.0	35.0	100	3.0	15.0	10.0
3.0	40.0	6.0	3.0	15.0	10.0
4.0	60.0	6.0	3.0	15.0	10.0
4.3	40.0	10.0	3.0	15.0	10.0
4.5	100.0	20.0	5.0	30.0	25.0
4.5	80.0	10.0	3.0	20.0	15.0
4.0	80.0	10.0	3.0	20.0	15.0
5.0	50.0	15.0	5.0	20.0	15.0
5.0	50.0	15.0	5.0	20.0	15.0
7.0	120.0	20.0	5.0	30.0	25.0
9.0	150.0	20.0	5.0	30.0	25.0
8.0	60.0	15.0	5.0	25.0	15.0
10.0	180.0	20.0	5.0	40.0	25.0
11.0	250.0	20.0	5.0	40.0	25.0
12.0	300.0	20.0	5.0	40.0	25.0
4.5	100.0	20.0	5.0	30.0	25.0
7.0	120.0	20.0	5.0	30.0	25.0
9.0	150.0	20.0	5.0	30.0	15.0
10.0	180.0	20.0	5.0	40.0	25.0
10.0	200.0	20.0	5.0	40.0	25.0

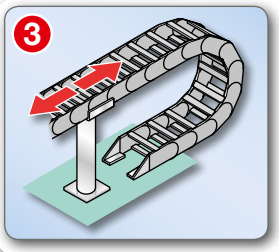
Installation options for cable drag chains



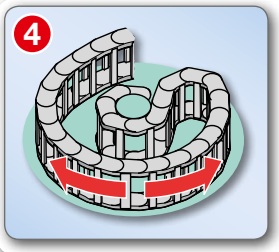
Horizontal installation option, self-supporting



Horizontal installation option, gliding

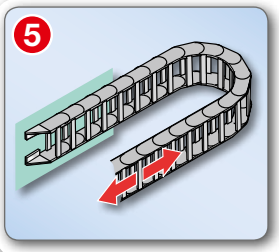


Horizontal installation option, self-supporting, overlap with support

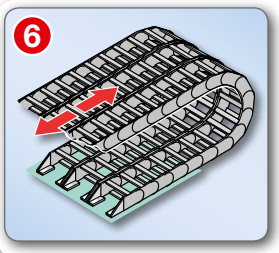


Horizontal installation option, circular movement

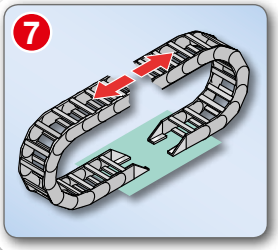
Design using reverse bending radius



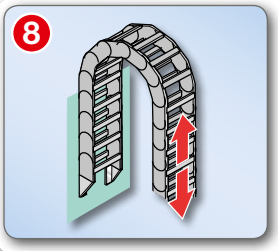
Horizontal installation option, side-mounted (rotated 90°)



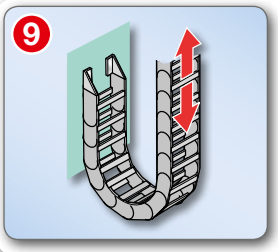
Horizontal installation option, parallel



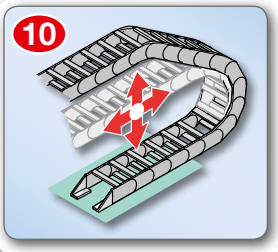
Horizontal installation option, opposed



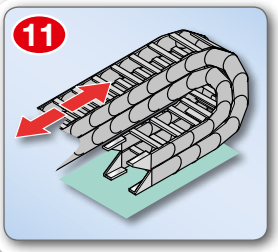
Vertical installation option, standing



Vertical installation option, hanging



Horizontal/vertical combined installation option



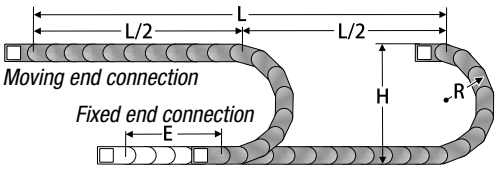
Horizontal installation option, interlocked

CDC system planning form

❑ **Quotation** ❑ **Order** **Date:**

Project designation:		**Project implementation in week/year:**
Customer No.:	**Customer information:**	**Planning extent:**
Company:		❑ Cable drag chain (CDC)
Department:		❑ Guide channel
Contact person:		❑ Tubes
Street/PO Box:		❑ Cables
Address/PO Box:		❑ Wire connection
Phone and extension no.:		❑ Complete assembly
Fax and extension no.:		❑ MP on-site assembly service
E-mail address:		

Application parameters:

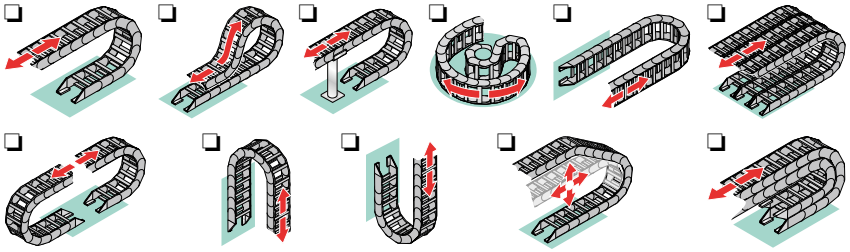


Cable entry point:

❑ *in the centre*

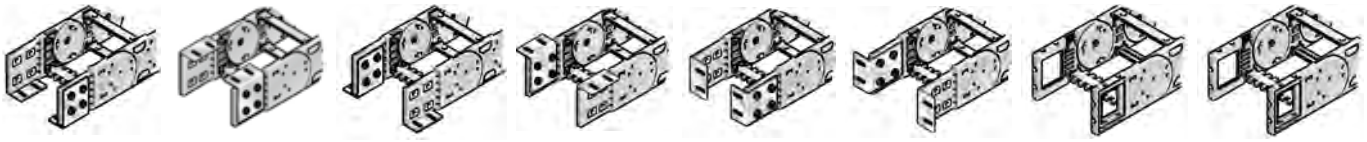
•– – –► ❑ *outside of the centre*

Please select type of installation:



CDC type (also competitors):				Quantity of CDC:	Units
CDC length (if predefined):	mm			Quantity of links:	Units
Travel distance (L):	mm			Minimum bending radius (R):	mm
Maximum installation height (H):	mm			Maximum installation width:	mm
Speed of travel:	m/s			Material:	❑ PA (Standard)
Acceleration:	m/s²				❑ PA UL V0
Travel frequency:	cycles/day				❑ PA ESD
Load:	kg/m				❑ PP
Ambient temperature (from - to):	°C	°C			
Environmental influences:	❑ Outdoor application	❑ Dirt	❑ Swarf	❑ Dust	❑
Feed-in (cable entry point):	❑ Centre of travel distance	❑ Ends of travel distance			
Dist. E between entry point/middle of travel distance:	mm	from the centre of travel distance			

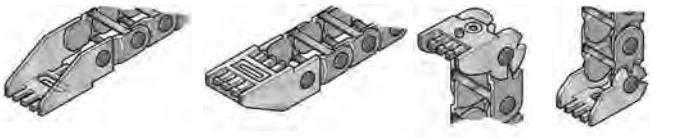
1. Inside/Down 2. Inside/Up 3. Outside/down 4. Outside/up 5. Front/Inside 6. Front/outside 7. Flex/bush 8. Flex/thread



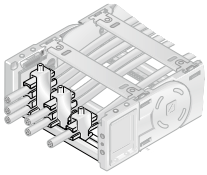
Chain bracket

Fixed end connection - no.:	
Moving end connection - no.:	

9. U-part/below 10. U-part/above 11. Up 90° 12. Down 90°



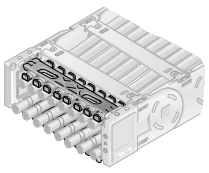
Case example: KA/F with C-profile and Steel Fix bow clamps



Strain relief

❑ Frame bridge strain relief plate (type RS-ZL with standard inside widths up to 246 mm)	
❑ Strain relief plates (type ZL for strain relief outside of the chain bracket)	
❑ C-profile including strain relief plate (type ZL-C Set)	
❑ C-profile	
❑ Steel Fix bow clamps	Type:
❑ on both sides	

Case example: KA/F with frame bridge strain relief plate RS-ZL



Cut out and fax/copy

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Project designation:	Project implementation in week/year:

Opening variant of the CDC (loading side)	❑ inside bend	❑ outside bend
	❑ on both sides	

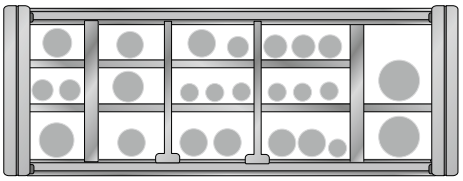
Variable guide channel systems

❑ Murrplastik quotation requested — Material: ❑ Plastic ❑ Aluminium ❑ Stainless steel ❑ Steel (zinc-plated)

❑ Guide channel existing / dimensions		Additional foreign components:
Internal width of the guide channel:	mm	
Internal height of the guide channel:	mm	
Distance of bearing profiles:	mm	

Partitioning the energy carriers (cables, tubes) into the internal chain compartment

❑ Chain compartment is supposed to be designed by Murrplastik
❑ Assignment according to Murrplastik cable request form
❑ Murrplastik is supposed to be supply cables, details in MP cable request form
❑ Chain compartment according to customer request (see sketch below)
❑ Cables provided by customer (remark outside diameters below)



Example: Multi-layer internal chain compartment

Sketches, notes, specific features:

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CDC cable request form

❑ **Quotation** ❑ **Order** **Date:**

Project designation:		**Project implementation in week/year:**
Customer No.:	**Customer information:**	
Company:		
Department:		
Contact person:		
Street/PO Box:		
Address/PO Box:		
Phone and extension no.:		
Fax and extension no.:		
E-mail address:		

Environmental conditions of the cable drag chain application – required for the choice of cable types			
Bending radius:	mm		❑ Oil-resistant
Travel distance:	mm		❑ UV resistant/outdoor application
minimum temperature:	°C		❑ UL/CSA authorisation requested (operation in the US/Canada)*
maximum temperature:	°C		* low stock, low options, long delivery times and minimum order quantity applicable
Speed of travel:	m/s		❑ corresponding drawing / data for wire connection attached
Other:			❑ customisation: see MP wire connection form

CDC assignment

** *cables without customisation are cut to total length only*
per cable one wire connection form is to be attached

Pos. No.	**Cables/conduits** Description, number of wires, cross section, reference type, item no. etc.	External ø in mm	Shielding requested?	Customisation requested?** (separate form)	Total-length in m	Overlap at fixed point in m	Overlap at moving point in m
			❑ yes	❑ yes			
			❑ yes	❑ yes			
			❑ yes	❑ yes			
			❑ yes	❑ yes			
			❑ yes	❑ yes			
			❑ yes	❑ yes			
			❑ yes	❑ yes			
			❑ yes	❑ yes			
			❑ yes	❑ yes			
			❑ yes	❑ yes			
			❑ yes	❑ yes			
			❑ yes	❑ yes			
			❑ yes	❑ yes			
			❑ yes	❑ yes			
			❑ yes	❑ yes			
			❑ yes	❑ yes			
			❑ yes	❑ yes			
			❑ yes	❑ yes			
			❑ yes	❑ yes			
			❑ yes	❑ yes			
			❑ yes	❑ yes			
			❑ yes	❑ yes			
			❑ yes	❑ yes			
			❑ yes	❑ yes			

Cables with green-yellow protective conductor (PE) are standard (exception: bus and data cables up to 0.75 mm²).
Cables with PE are often also marked with G, e.g. 3G1.5 means two normal conductors and 1 PE with a cross section of 1.5 mm² each.
Please identify cables without protective/ground conductor (PE)!

Cable customisation form

Enclosure to CDC cable request form

Project designation:		
Position within CDC cable request form no.:		**Features:**
Cable reference type:		❑ No shielding
Conduit construction/design:		❑ shielded (see below: *Shield processing*)
Contact person:		❑ Cable without protective conductor PE
	Cables with green-yellow protective conductor (PE) are standard (exception: bus and data cables up to 0.75 mm²). Cables with PE are often also marked with G, e.g. 3G1.5 means two normal conductors and 1 PE with a cross section of 1.5 mm² each.	

Customisation of cable endings

FP aspect (fixed point connection)	**MP aspect (moving point connection)**
❑ **Ending not processed** – cable cut to total length only	❑ **Ending not processed** – cable cut to total length only

alternatively: **alternatively:**

❑ **Ending with connector**		❑ **Ending with connector**	
Item no. of connector:		Item no. of connector:	
Description, supplier:		Description, supplier:	
Connections (quantity of contacts):		**Connections (quantity of contacts):**	
❑ Male connector		❑ Male connector	
❑ Female connector		❑ Female connector	
Item no. of contact:		Item no. of contact:	
Housing for connector:		**Housing for connector:**	
Item no. / design:		Item no. / design:	
Cable outlet on housing:	❑ straight ❑ sideways	**Cable outlet** on housing:	❑ straight ❑ sideways
Cable compression gland (type):		**Cable compression gland (type):**	

Wiring specifications

❑ Pin assignment: see enclosed plan or chart

❑ Standard wiring as extension cord (pin 1 to 1, 2 to 2 etc.)

When used as an extension the connectors are wired from pin 1. If there are not enough wires, the high contact pins will be unconnected.

alternatively: **alternatively:**

❑ **End processed** (without housing)		❑ **End processed** (without housing)	
Bared cable length (jacket free):		Bared cable length (jacket free):	
Wire end ferrule:		Wire end ferrule:	
Contacts:		Contacts:	
Ring-type cable lugs:		Ring-type cable lugs:	
	(Type, supplier, item no., size, which wire?)		(Type, supplier, item no., size, which wire?)

❑ **Shield processing**	Entire shield	if necessary pair(s) of wire(s)	❑ **Shield processing**	Entire shield	if necessary pair(s) of wire(s)
cut:			cut:		
on housing:			on housing:		
shield connected to pin No.:			shield connected to pin No.:		
extended with wire/length:		mm	extended with wire/length:		mm
shield bent back on jacket:			shield bent back on jacket:		

❑ **Labelling**	Short text:	❑ **Labelling**	Short text:
❑ label cable jacket (sticker, ESL):		❑ label cable jacket (sticker, ESL):	
❑ label single wire(s) (e.g. KDE):		❑ label single wire(s) (e.g. KDE):	
Distance from jacket/cable end:	mm	Distance from jacket/cable end:	mm

Additional text for labelling: see attached circuit diagram:

Notes (attachments etc.):

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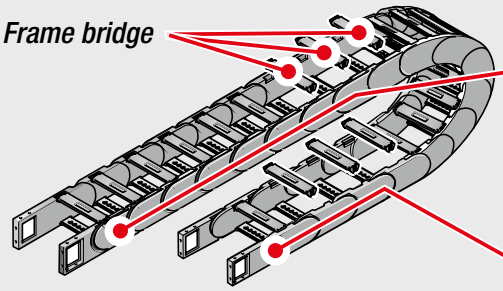
Murrplastik Glossary – So that you know what we are talking about

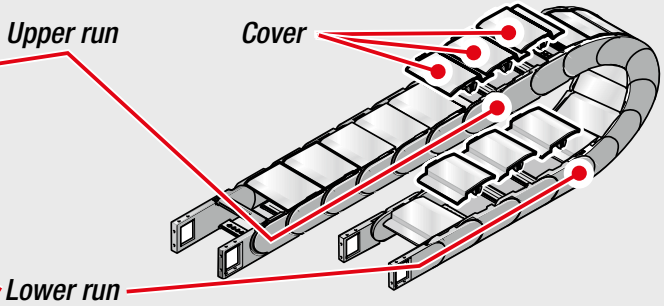
We want to make our products and product components as accessible to you as possible. So what, then, are the actual names Murrplastik uses for specific components?

You'll find the answers in this Glossary. We have prepared some schematic drawings of sub-assemblies and individual components for you with the terms that we use for them.

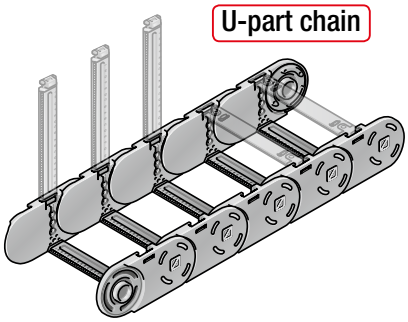
Open cable drag chain



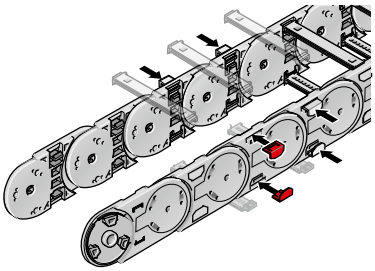
Closed cable drag chain



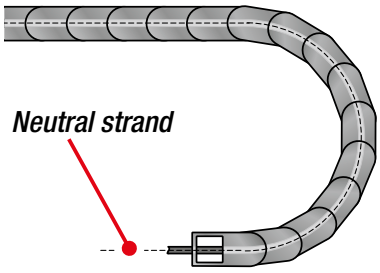
U-part chain



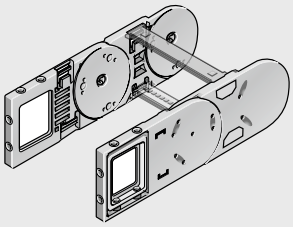
Side link chain



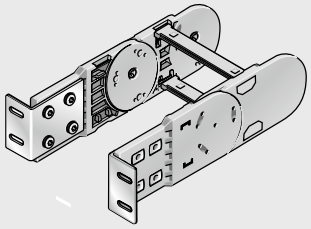
Install position for cabling



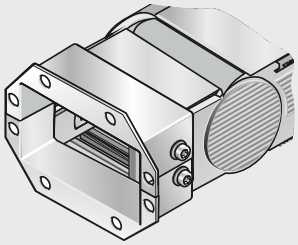
Chain bracket types



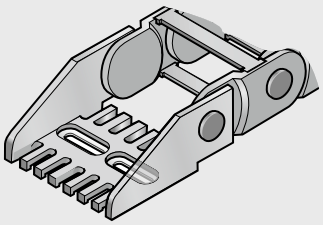
Chain bracket flexible



Chain bracket angle

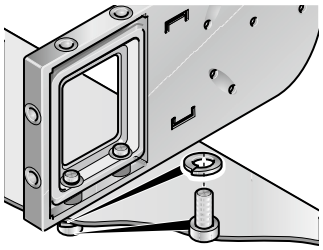


End brackets flange

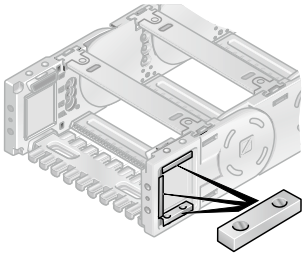


Chain bracket U-part

Fixing elements

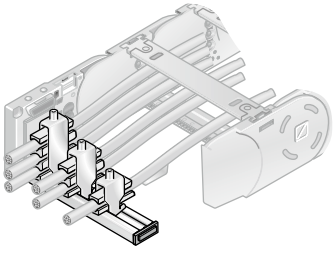


Extrusion-coated metal bushing

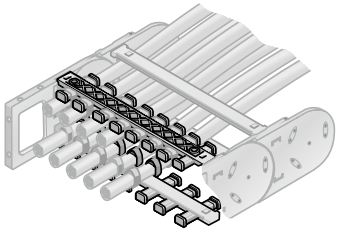


Insert panel

Strain relief in the chain bracket



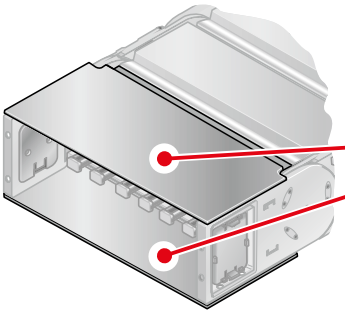
Steel Fix on C-rail



Frame bridge strain relief plate RS-ZL

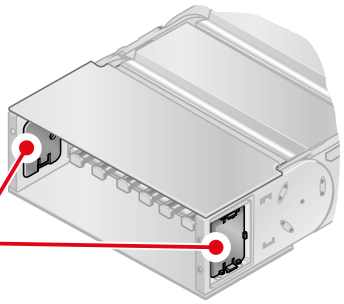
Murrplastik Glossary – So that you know what we are talking about

Chain bracket canopies, ClosedLine

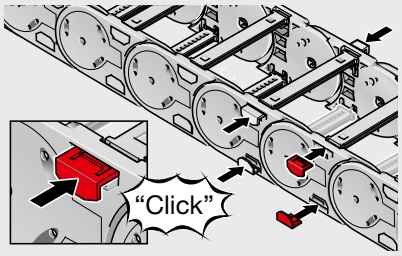


Chain bracket cover

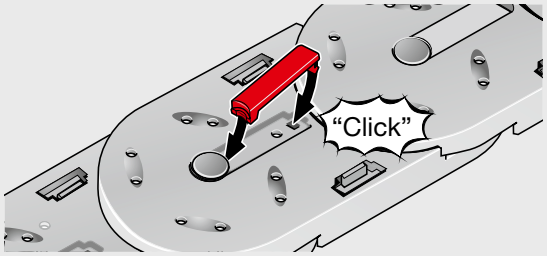
Mounting window cover



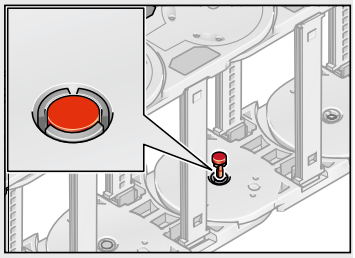
Locking elements



Frame bridge lock



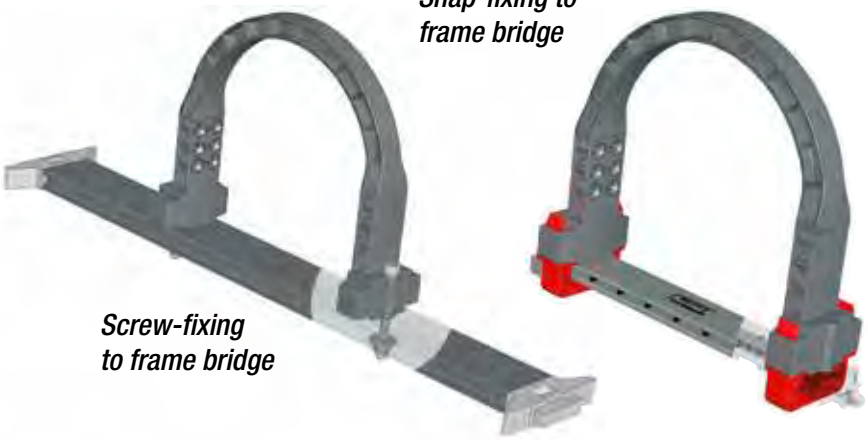
Side link lock



Lock button

Extender frame bridge

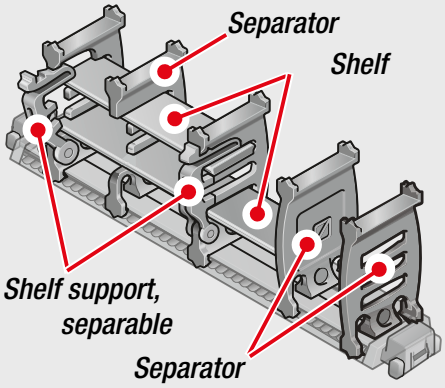
Snap-fixing to frame bridge



Screw-fixing to frame bridge

Screw-fixing to plastic/aluminium cover

Shelving system components

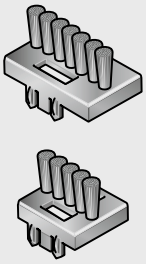


Separator

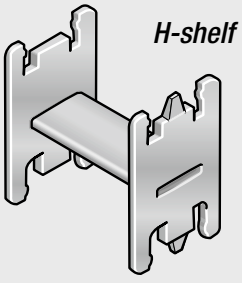
Shelf

Shelf support, separable

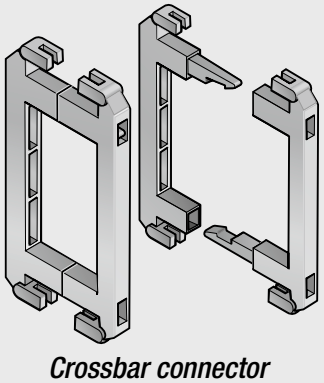
Separator



Brush support



H-shelf



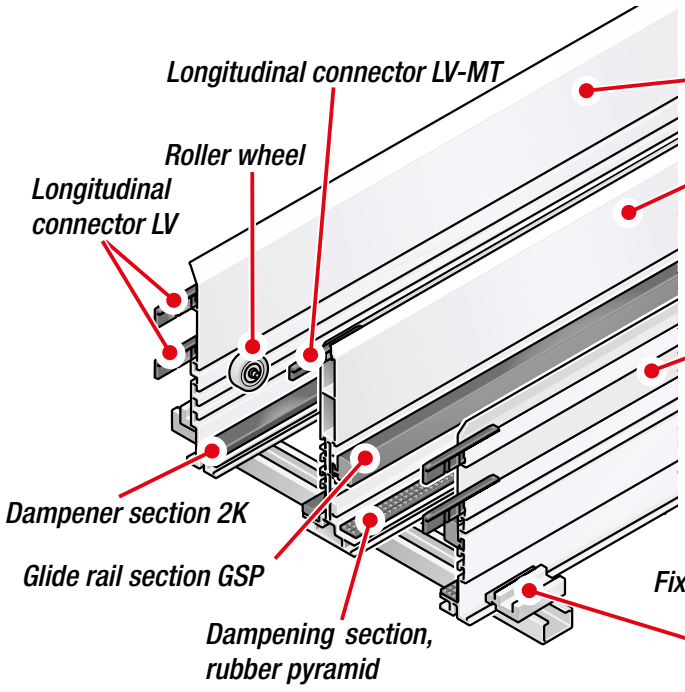
Crossbar connector

Murrplastik Glossary – So that you know what we are talking about

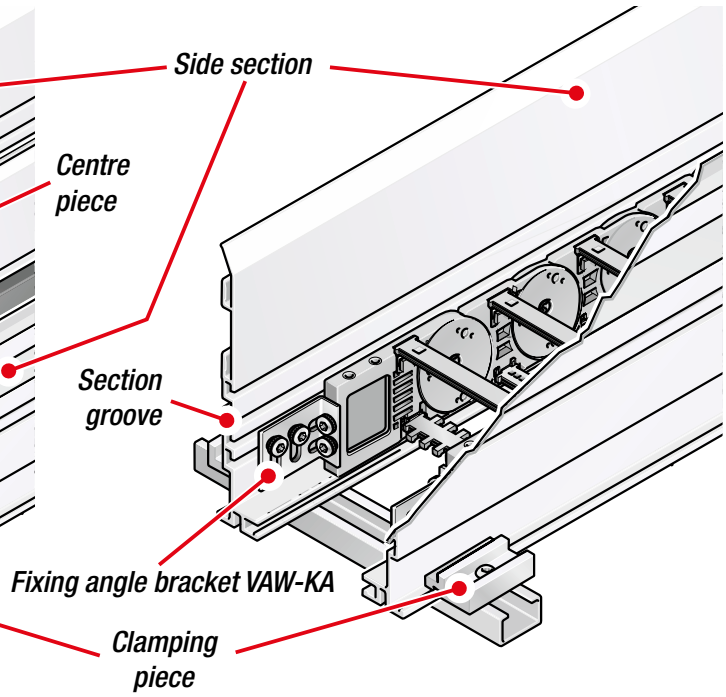
Our guide channel systems and their accessory parts are also given specific names. So what, then, are the names Murrplastik uses for specific components?

You'll find the answers in this Glossary. We have prepared some schematic drawings of sub-assemblies and individual components for you with the terms that we use for them.

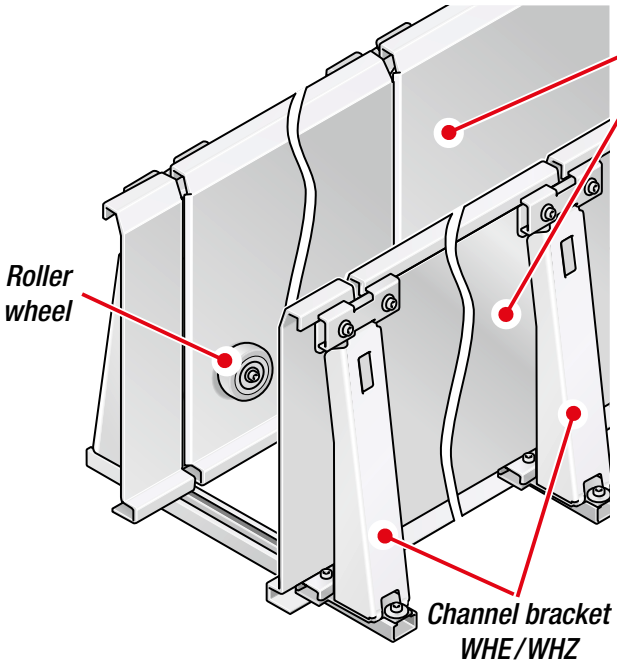
VAW aluminium



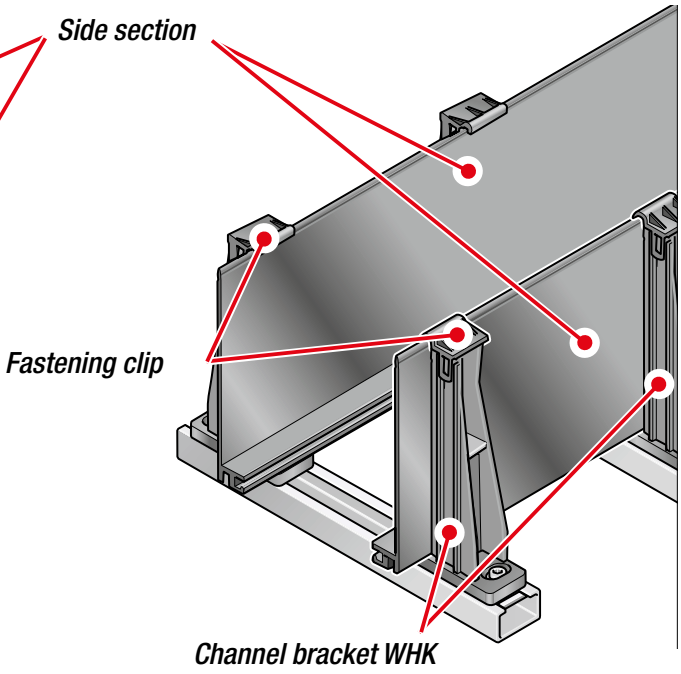
Fixing angle bracket, chain bracket in VAW



VAW-E stainless steel /VAW-Z zinc-plated steel



VAWK plastic



Cable drag chains sorted by interior height

EasyLine MP 10.1

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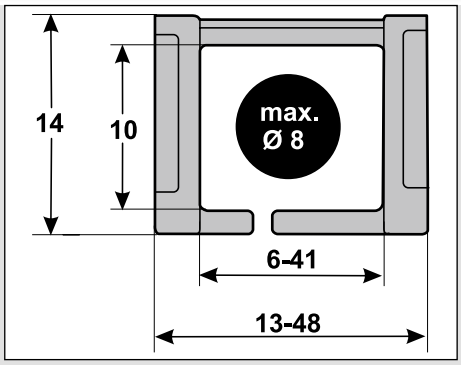
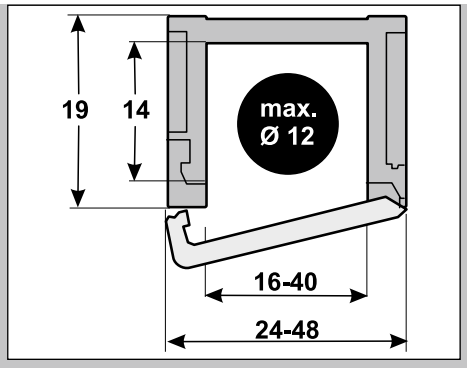


- Internal height: 10.0 mm
- Internal widths: 6.0 – 41.0 mm
- Radii: 18.0 – 58.0 mm
- Pitch: 15.0 mm
- Links per metre: 67 qty.
- Loading side: outside flexure curve slitted

MultiLine MP 14

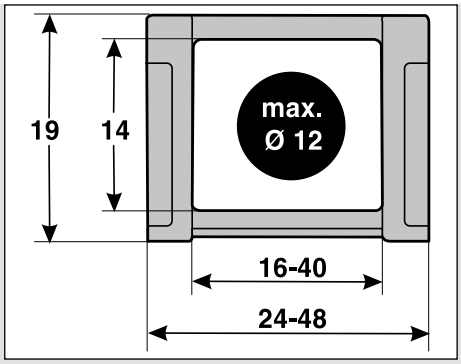
Page 54



- Internal height: 14.0 mm
- Internal widths: 16.0 – 40.0 mm
- Radii: 25.0 – 75.0 mm
- Pitch: 26.0 mm
- Links per metre: 38 qty.
- Loading side: outside flexure curve

MultiLine MP 15

Page 62



- Internal height: 14.0 mm
- Internal widths: 16.0 – 40.0 mm
- Radii: 25.0 – 75.0 mm
- Pitch: 26.0 mm
- Links per metre: 38 qty.
- Loading side: Non-opening

MultiLine MP 18.1 MP 18.2

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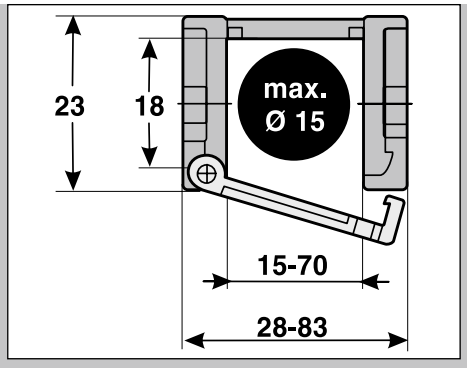
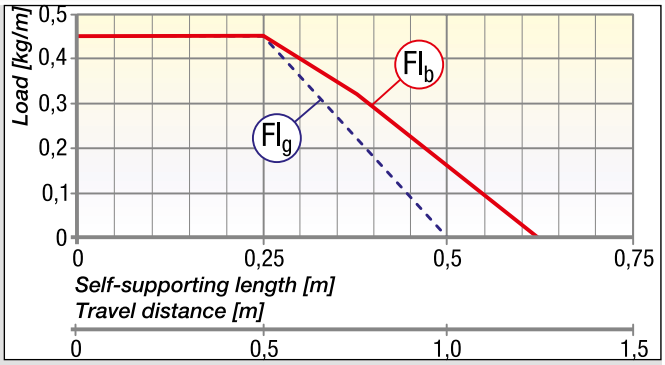
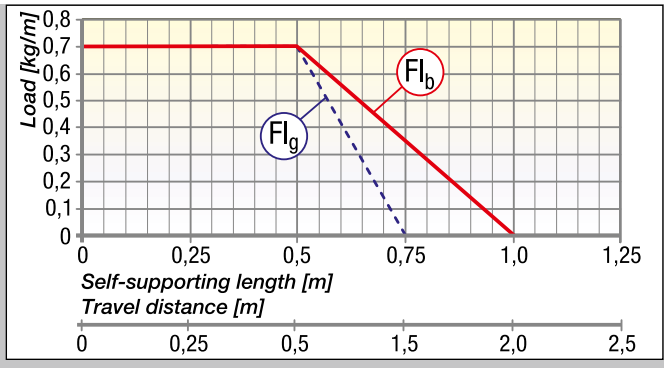


- Internal height: 18.0 mm
- Internal widths: 15.0 – 70.0 mm
- Radii: 28.0 – 78.0 mm
- Pitch: 33.0 mm
- Links per metre: 30 qty.
- Loading side: Inside or outside flexure curve

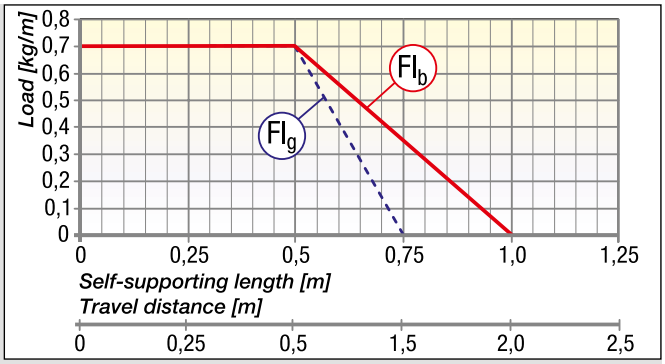
- Travel distance gliding L_g max.: 10.0 m
- Travel distance self-supporting L_f max.: see diagram
- Travel distance vertical, hanging L_{vh} max.: 2.0 m
- Travel distance vertical, upright L_{vs} max.: 1.0 m
- Rotated 90°, unsupported L_{90f} max.: not recommended
- Speed, gliding V_g max.: 2.0 m/s
- Speed, self-supporting V_f max.: 4.0 m/s
- Acceleration, gliding a_g max.: 2.0 m/s²
- Acceleration, self-supporting a_f max.: 2.0 m/s²



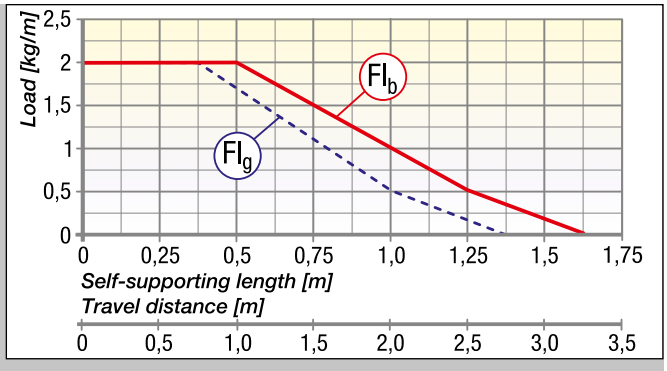
- Travel distance gliding L_g max.: 12.0 m
- Travel distance self-supporting L_f max.: see diagram
- Travel distance vertical, hanging L_{vh} max.: 3.0 m
- Travel distance vertical, upright L_{vs} max.: 2.0 m
- Rotated 90°, unsupported L_{90f} max.: not recommended
- Speed, gliding V_g max.: 2.0 m/s
- Speed, self-supporting V_f max.: 4.0 m/s
- Acceleration, gliding a_g max.: 2.0 m/s²
- Acceleration, self-supporting a_f max.: 2.0 m/s²



- Travel distance gliding L_g max.: 12.0 m
- Travel distance self-supporting L_f max.: see diagram
- Travel distance vertical, hanging L_{vh} max.: 3.0 m
- Travel distance vertical, upright L_{vs} max.: 2.0 m
- Rotated 90°, unsupported L_{90f} max.: not recommended
- Speed, gliding V_g max.: 2.0 m/s
- Speed, self-supporting V_f max.: 4.0 m/s
- Acceleration, gliding a_g max.: 2.0 m/s²
- Acceleration, self-supporting a_f max.: 2.0 m/s²



- Travel distance gliding L_g max.: 20.0 m
- Travel distance self-supporting L_f max.: see diagram
- Travel distance vertical, hanging L_{vh} max.: 8.0 m
- Travel distance vertical, upright L_{vs} max.: 3.0 m
- Rotated 90°, unsupported L_{90f} max.: 0.5 m
- Speed, gliding V_g max.: 2.0 m/s
- Speed, self-supporting V_f max.: 5.0 m/s
- Acceleration, gliding a_g max.: 5.0 m/s²
- Acceleration, self-supporting a_f max.: 5.0 m/s²



Cable drag chains sorted by interior height

MultiLine MP 25G

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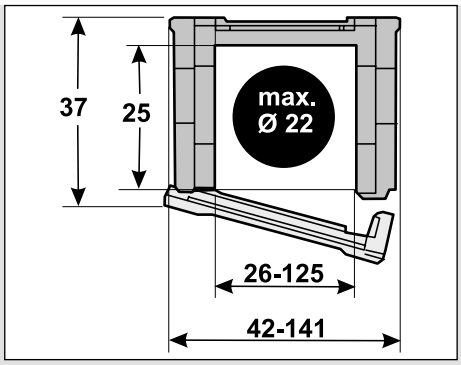
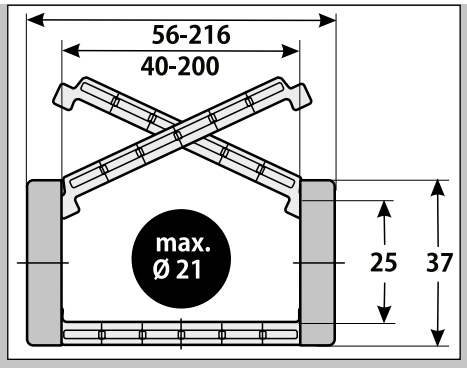


- Internal height: 25.0 mm
- Internal widths: 26.0 – 125.0 mm
- Radii: 60.0 – 250.0 mm
- Pitch: 30.0 mm
- Links per metre: 33 qty.
- Loading side: outside flexure curve

ModulLine MP 25

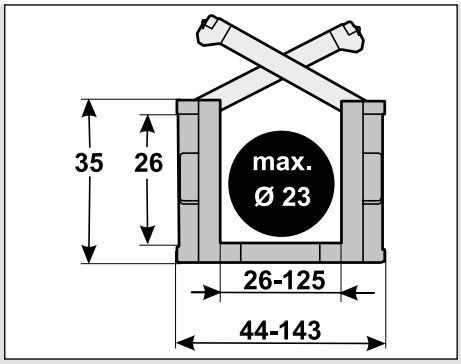
Page 140



- Internal height: 25.0 mm
- Internal widths: 40.0 – 200.0 mm
- Radii: 50.0 – 300.0 mm
- Pitch: 45.0 mm
- Links per metre: 22 qty.
- Loading side: Inside or outside flexure curve

MultiLine MP 3000

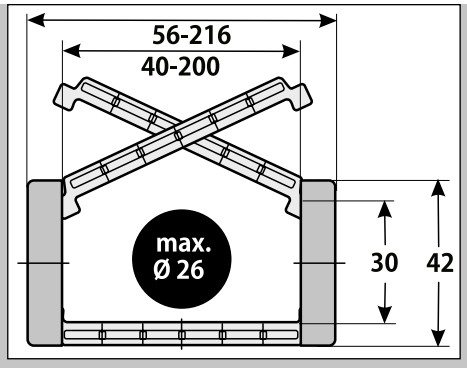
Page 86



- Internal height: 26.0 mm
- Internal widths: 26.0 – 125.0 mm
- Radii: 50.0 – 300.0 mm
- Pitch: 45.0 mm
- Links per metre: 22 qty.
- Loading side: Inside bend

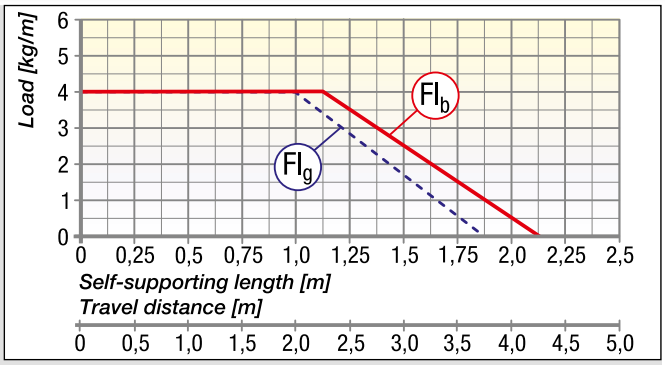
ModulLine MP 30

Page 152

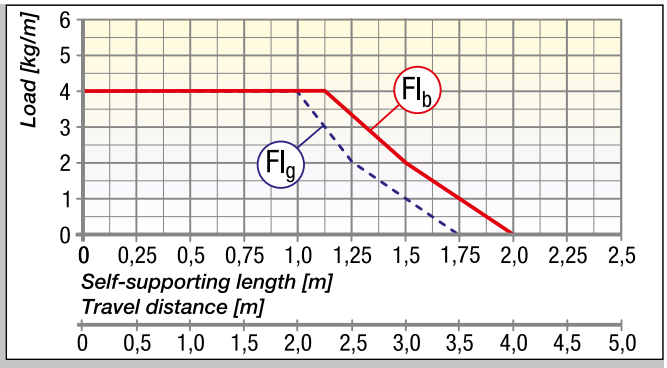


- Internal height: 30.0 mm
- Internal widths: 40.0 – 200.0 mm
- Radii: 60.0 – 300.0 mm
- Pitch: 50.0 mm
- Links per metre: 20 qty.
- Loading side: Inside or outside flexure curve

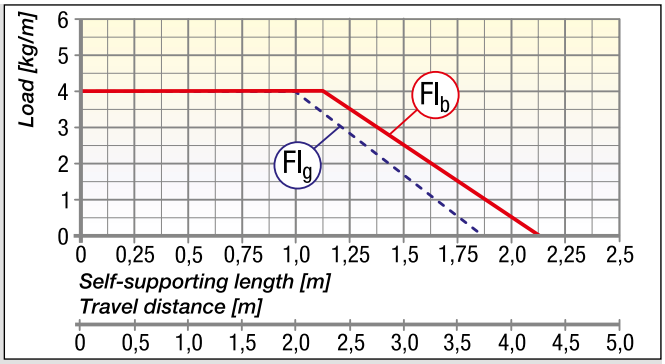
- Travel distance gliding L_g max.: 40.0 m
- Travel distance self-supporting L_f max.: see diagram
- Travel distance vertical, hanging L_{vh} max.: 25.0 m
- Travel distance vertical, upright L_{vs} max.: 3.0 m
- Rotated 90°, unsupported L_{90f} max.: 1.0 m
- Speed, gliding V_g max.: 3.0 m/s
- Speed, self-supporting V_f max.: 6.0 m/s
- Acceleration, gliding a_g max.: 10.0 m/s²
- Acceleration, self-supporting a_f max.: 15.0 m/s²



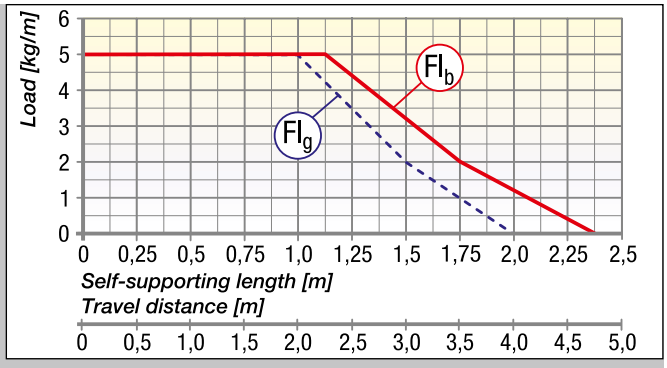
- Travel distance gliding L_g max.: 35.0 m
- Travel distance self-supporting L_f max.: see diagram
- Travel distance vertical, hanging L_{vh} max.: 25.0 m
- Travel distance vertical, upright L_{vs} max.: 3.0 m
- Rotated 90°, unsupported L_{90f} max.: 0.7 m
- Speed, gliding V_g max.: 3.0 m/s
- Speed, self-supporting V_f max.: 10.0 m/s
- Acceleration, gliding a_g max.: 10.0 m/s²
- Acceleration, self-supporting a_f max.: 15.0 m/s²



- Travel distance gliding L_g max.: 60.0 m
- Travel distance self-supporting L_f max.: see diagram
- Travel distance vertical, hanging L_{vh} max.: 40.0 m
- Travel distance vertical, upright L_{vs} max.: 3.0 m
- Rotated 90°, unsupported L_{90f} max.: 0.7 m
- Speed, gliding V_g max.: 3.0 m/s
- Speed, self-supporting V_f max.: 6.0 m/s
- Acceleration, gliding a_g max.: 10.0 m/s²
- Acceleration, self-supporting a_f max.: 15.0 m/s²

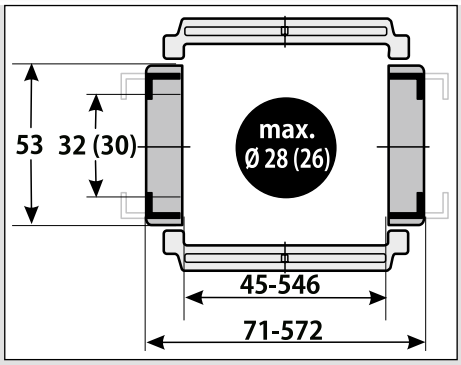


- Travel distance gliding L_g max.: 40.0 m
- Travel distance self-supporting L_f max.: see diagram
- Travel distance vertical, hanging L_{vh} max.: 30.0 m
- Travel distance vertical, upright L_{vs} max.: 3.0 m
- Rotated 90°, unsupported L_{90f} max.: 0.7 m
- Speed, gliding V_g max.: 3.0 m/s
- Speed, self-supporting V_f max.: 10.0 m/s
- Acceleration, gliding a_g max.: 10.0 m/s²
- Acceleration, self-supporting a_f max.: 15.0 m/s²



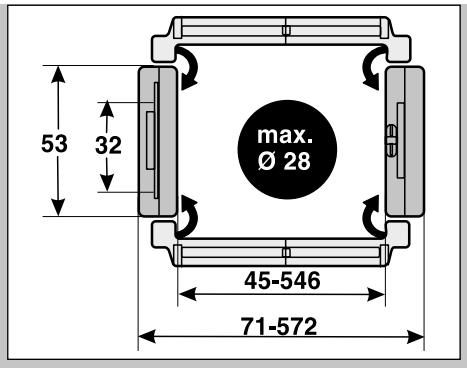
Cable drag chains sorted by interior height

PowerLine
MP 32.2
MP 32.3
Page 164



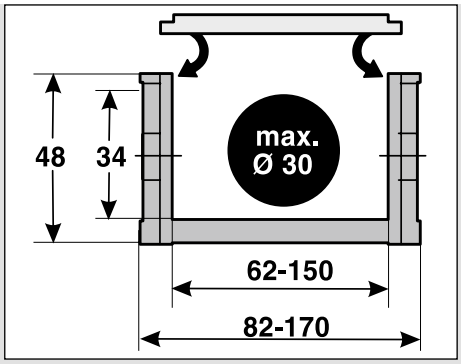
- Internal height: 32.0 mm
- Internal widths: 45.0 – 546.0 mm
- Radii: 80.0 – 250.0 mm
- Pitch: 64.5 mm
- Links per metre: 16 qty.
- Loading side: inside and outside flexure curve
- MP 32.3 inner widths 62–346 mm,
  radii 120–250 mm,
  lower inner height (values in brackets)

MP Classic
MP 32
Page 238



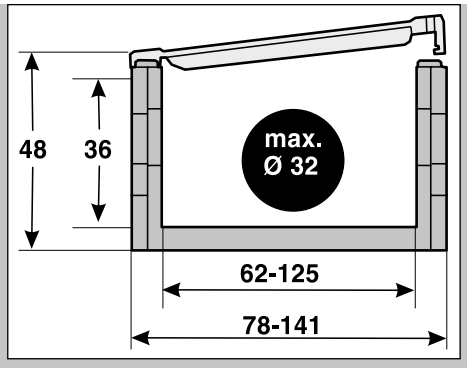
- Internal height: 32.0 mm
- Internal widths: 45.0 – 546.0 mm
- Radii: 80.0 – 250.0 mm
- Pitch: 64.5 mm
- Links per metre: 16 qty.
- Loading side: inside and outside flexure curve

MultiLine
MP 35
Page 96



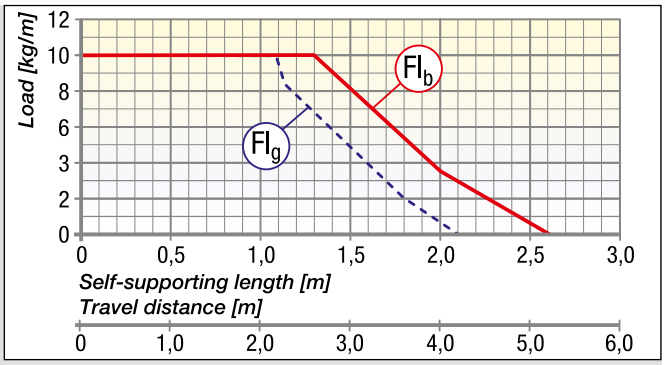
- Internal height: 34.0 mm
- Internal widths: 62.0 – 150.0 mm
- Radii: 70.0 – 300.0 mm
- Pitch: 58.0 mm
- Links per metre: 17 qty.
- Loading side: Inside bend

MultiLine
MP 36G
Page 106

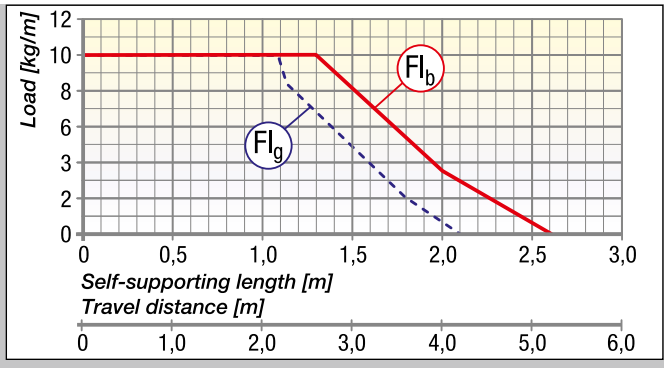


- Internal height: 36.0 mm
- Internal widths: 62.0 – 125.0 mm
- Radii: 80.0 – 200.0 mm
- Pitch: 40.0 mm
- Links per metre: 25 qty.
- Loading side: Inside bend

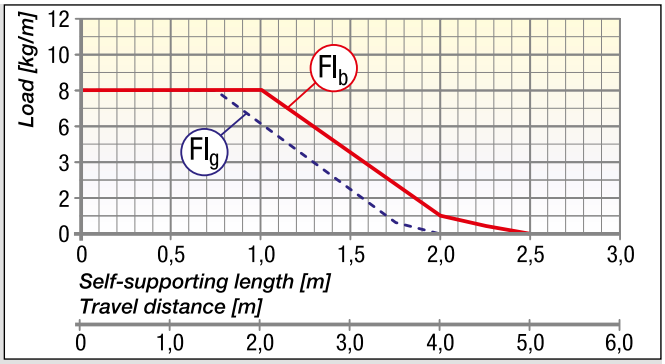
- Travel distance gliding L_g max.: 100.0 m
- Travel distance self-supporting L_f max.: see diagram
- Travel distance vertical, hanging L_{vh} max.: 40.0 m
- Travel distance vertical, upright L_{vs} max.: 5.0 m
- Rotated 90°, unsupported L_{90f} max.: 1.0 m
- Speed, gliding V_g max.: 5.0 m/s
- Speed, self-supporting V_f max.: 20.0 m/s
- Acceleration, gliding a_g max.: 25.0 m/s²
- Acceleration, self-supporting a_f max.: 30.0 m/s²



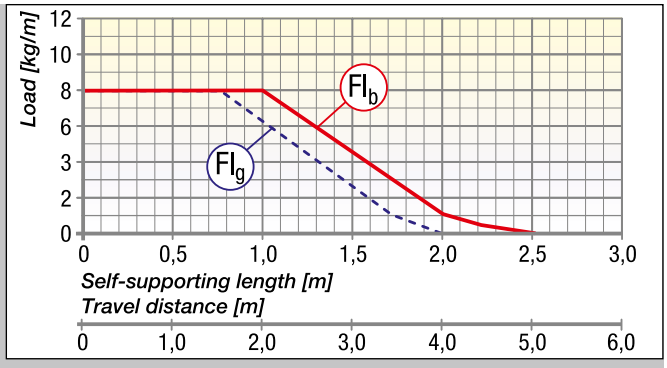
- Travel distance gliding L_g max.: 100.0 m
- Travel distance self-supporting L_f max.: see diagram
- Travel distance vertical, hanging L_{vh} max.: 40.0 m
- Travel distance vertical, upright L_{vs} max.: 5.0 m
- Rotated 90°, unsupported L_{90f} max.: 2.0 m
- Speed, gliding V_g max.: 5.0 m/s
- Speed, self-supporting V_f max.: 20.0 m/s
- Acceleration, gliding a_g max.: 25.0 m/s²
- Acceleration, self-supporting a_f max.: 30.0 m/s²



- Travel distance gliding L_g max.: 80.0 m
- Travel distance self-supporting L_f max.: see diagram
- Travel distance vertical, hanging L_{vh} max.: 40.0 m
- Travel distance vertical, upright L_{vs} max.: 3.0 m
- Rotated 90°, unsupported L_{90f} max.: 1.0 m
- Speed, gliding V_g max.: 3.0 m/s
- Speed, self-supporting V_f max.: 10.0 m/s
- Acceleration, gliding a_g max.: 15.0 m/s²
- Acceleration, self-supporting a_f max.: 20.0 m/s²



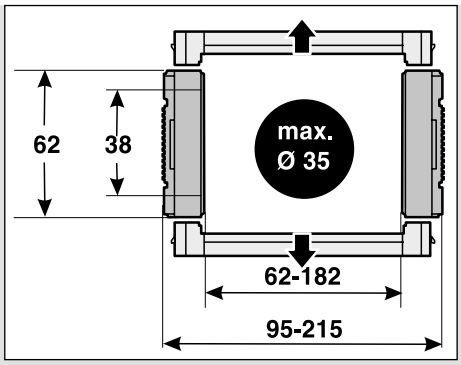
- Travel distance gliding L_g max.: 60.0 m
- Travel distance self-supporting L_f max.: see diagram
- Travel distance vertical, hanging L_{vh} max.: 30.0 m
- Travel distance vertical, upright L_{vs} max.: 3.0 m
- Rotated 90°, unsupported L_{90f} max.: 1.0 m
- Speed, gliding V_g max.: 3.0 m/s
- Speed, self-supporting V_f max.: 10.0 m/s
- Acceleration, gliding a_g max.: 15.0 m/s²
- Acceleration, self-supporting a_f max.: 20.0 m/s²



Cable drag chains sorted by interior height

MultiLine MP 43G

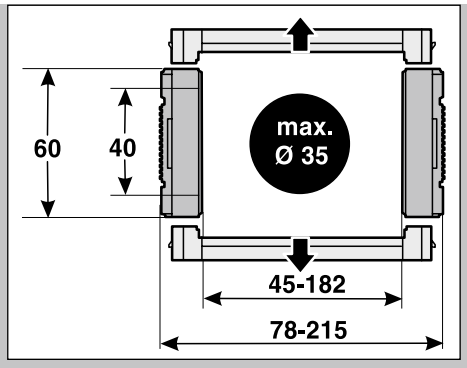
Page 114



- Internal height: 38.0 mm
- Internal widths: 62.0 – 182.0 mm
- Radii: 125.0 – 250.0 mm
- Pitch: 75.5 mm
- Links per metre: 13 qty.
- Loading side: inside and outside flexure curve

MultiLine MP 44

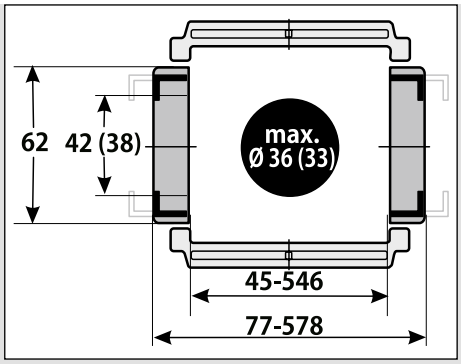
Page 122



- Internal height: 40.0 mm
- Internal widths: 45.0 – 182.0 mm
- Radii: 90.0 – 250.0 mm
- Pitch: 75.5 mm
- Links per metre: 13 qty.
- Loading side: inside and outside flexure curve

PowerLine MP 41.2 MP 41.3

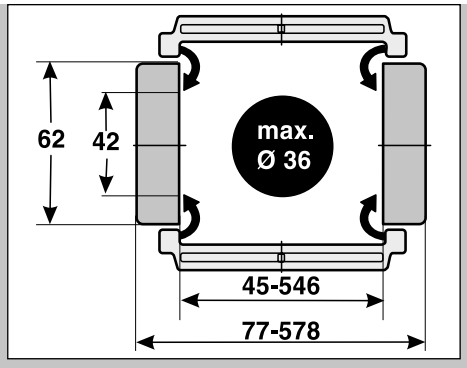
Page 176



- Internal height: 42.0 mm
- Internal widths: 45.0 – 546.0 mm
- Radii: 90.0 – 350.0 mm
- Pitch: 77.0 mm
- Links per metre: 13 qty.
- Loading side: inside and outside flexure curve
- MP 41.3 inner widths 71–346 mm, radii 150–300 mm, lower inner height (values in brackets)

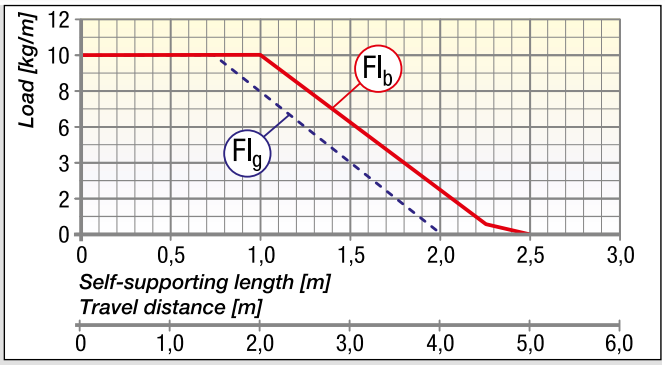
MP Classic MP 41

Page 250

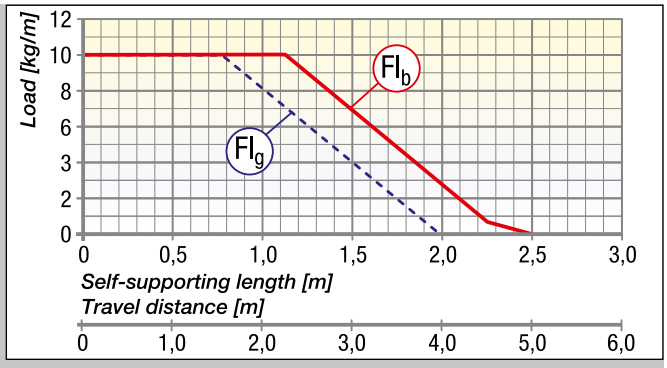


- Internal height: 42.0 mm
- Internal widths: 45.0 – 546.0 mm
- Radii: 90.0 – 350.0 mm
- Pitch: 77.0 mm
- Links per metre: 13 qty.
- Loading side: inside and outside flexure curve

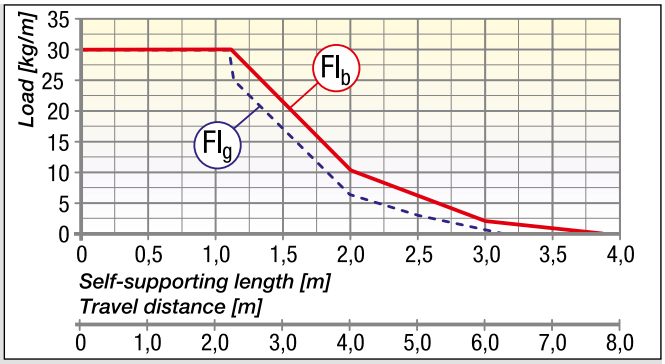
- Travel distance gliding L_g max.: 50.0 m
- Travel distance self-supporting L_f max.: see diagram
- Travel distance vertical, hanging L_{vh} max.: 40.0 m
- Travel distance vertical, upright L_{vs} max.: 3.0 m
- Rotated 90°, unsupported L_{90f} max.: 1.0 m
- Speed, gliding V_g max.: 5.0 m/s
- Speed, self-supporting V_f max.: 15.0 m/s
- Acceleration, gliding a_g max.: 15.0 m/s²
- Acceleration, self-supporting a_f max.: 20.0 m/s²



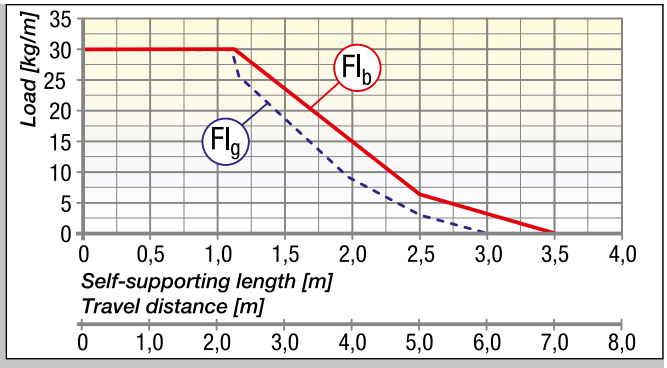
- Travel distance gliding L_g max.: 50.0 m
- Travel distance self-supporting L_f max.: see diagram
- Travel distance vertical, hanging L_{vh} max.: 40.0 m
- Travel distance vertical, upright L_{vs} max.: 3.0 m
- Rotated 90°, unsupported L_{90f} max.: 1.0 m
- Speed, gliding V_g max.: 5.0 m/s
- Speed, self-supporting V_f max.: 15.0 m/s
- Acceleration, gliding a_g max.: 15.0 m/s²
- Acceleration, self-supporting a_f max.: 20.0 m/s²



- Travel distance gliding L_g max.: 120.0 m
- Travel distance self-supporting L_f max.: see diagram
- Travel distance vertical, hanging L_{vh} max.: 50.0 m
- Travel distance vertical, upright L_{vs} max.: 6.0 m
- Rotated 90°, unsupported L_{90f} max.: 1.0 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/s²
- Acceleration, self-supporting a_f max.: 30.0 m/s²

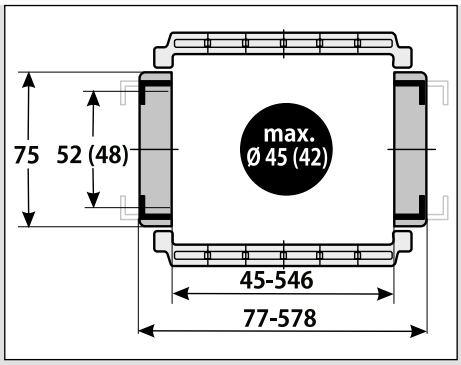


- Travel distance gliding L_g max.: 120.0 m
- Travel distance self-supporting L_f max.: see diagram
- Travel distance vertical, hanging L_{vh} max.: 50.0 m
- Travel distance vertical, upright L_{vs} max.: 6.0 m
- Rotated 90°, unsupported L_{90f} max.: 2.0 m
- Speed, gliding V_g max.: 5.0 m/s
- Speed, self-supporting V_f max.: 20.0 m/s
- Acceleration, gliding a_g max.: 25.0 m/s²
- Acceleration, self-supporting a_f max.: 30.0 m/s²



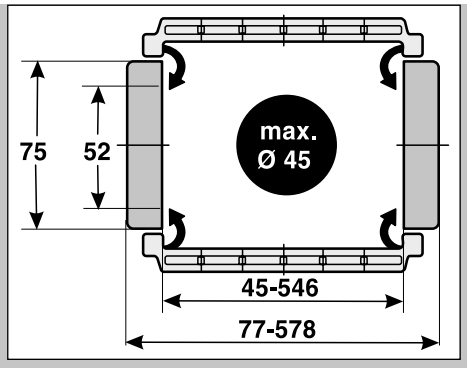
Cable drag chains sorted by interior height

PowerLine
MP 52.2
MP 52.3
Page 190



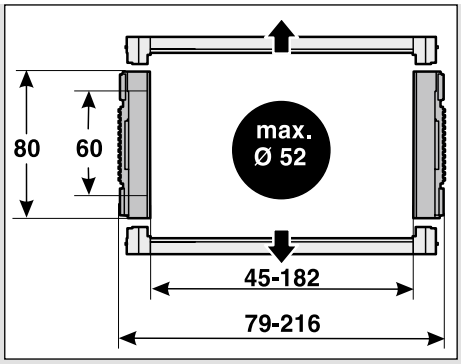
- Internal height: 52.0 mm
- Internal widths: 45.0 – 546.0 mm
- Radii: 100.0 – 350.0 mm
- Pitch: 91.0 mm
- Links per metre: 11 qty.
- Loading side: inside and outside flexure curve
- MP 52.3 inner widths 71–346 mm, radii 150-350 mm, lower inner height (values in brackets)

MP Classic
MP 52.1
Page 262



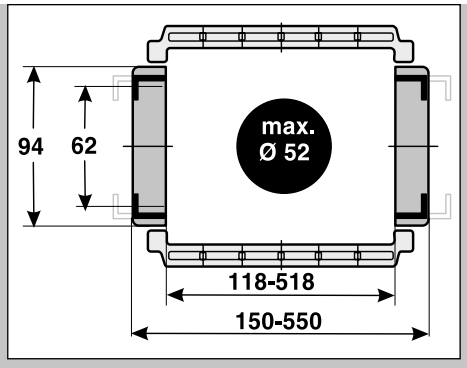
- Internal height: 52.0 mm
- Internal widths: 45.0 – 546.0 mm
- Radii: 100.0 – 350.0 mm
- Pitch: 91.0 mm
- Links per metre: 11 qty.
- Loading side: inside and outside flexure curve

MultiLine
MP 66
MP 65G
Page 130



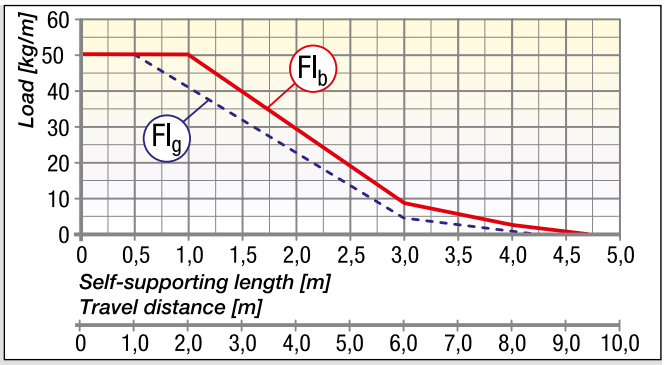
- Internal height: 60.0 mm
- Internal widths: 45.0 – 182.0 mm
- Radii: 150.0 – 400.0 mm
- Pitch: 91.5 mm
- Links per metre: 11 qty.
- Loading side: inside and outside flexure curve

HeavyLine
MP 62.2
MP 62.3
Page 204

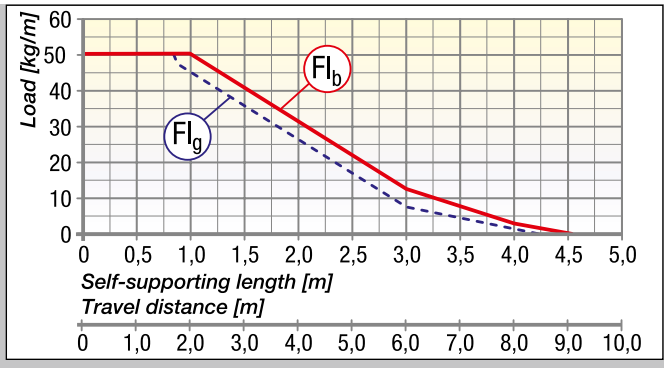


- Internal height: 62.0 mm
- Internal widths: 118.0 – 518.0 mm
- Radii: 150.0 – 500.0 mm
- Pitch: 100.0 mm
- Links per metre: 10 qty.
- Loading side: inside and outside flexure curve
- MP 62.3 inner widths 118–418 mm, radii 200–500 mm

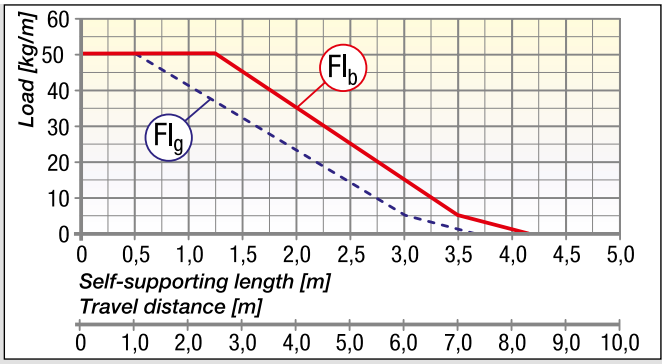
- Travel distance gliding L_g max.: 150.0 m
- Travel distance self-supporting L_f max.: see diagram
- Travel distance vertical, hanging L_{vh} max.: 60.0 m
- Travel distance vertical, upright L_{vs} max.: 6.0 m
- Rotated 90°, unsupported L_{90f} max.: 2.0 m
- Speed, gliding V_g max.: 5.0 m/s
- Speed, self-supporting V_f max.: 20.0 m/s
- Acceleration, gliding a_g max.: 25.0 m/s²
- Acceleration, self-supporting a_f max.: 30.0 m/s²



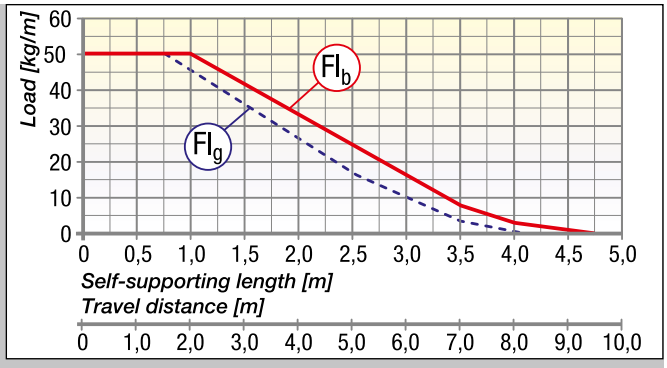
- Travel distance gliding L_g max.: 150.0 m
- Travel distance self-supporting L_f max.: see diagram
- Travel distance vertical, hanging L_{vh} max.: 60.0 m
- Travel distance vertical, upright L_{vs} max.: 6.0 m
- Rotated 90°, unsupported L_{90f} max.: 3.0 m
- Speed, gliding V_g max.: 5.0 m/s
- Speed, self-supporting V_f max.: 20.0 m/s
- Acceleration, gliding a_g max.: 25.0 m/s²
- Acceleration, self-supporting a_f max.: 30.0 m/s²



- Travel distance gliding L_g max.: 60.0 m
- Travel distance self-supporting L_f max.: see diagram
- Travel distance vertical, hanging L_{vh} max.: 50.0 m
- Travel distance vertical, upright L_{vs} max.: 5.0 m
- Rotated 90°, unsupported L_{90f} max.: 2.0 m
- Speed, gliding V_g max.: 5.0 m/s
- Speed, self-supporting V_f max.: 15.0 m/s
- Acceleration, gliding a_g max.: 15.0 m/s²
- Acceleration, self-supporting a_f max.: 20.0 m/s²

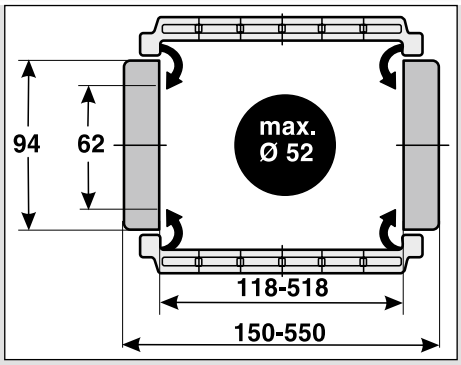


- Travel distance gliding L_g max.: 150.0 m
- Travel distance self-supporting L_f max.: see diagram
- Travel distance vertical, hanging L_{vh} max.: 65.0 m
- Travel distance vertical, upright L_{vs} max.: 6.0 m
- Rotated 90°, unsupported L_{90f} max.: 4.0 m
- Speed, gliding V_g max.: 5.0 m/s
- Speed, self-supporting V_f max.: 20.0 m/s
- Acceleration, gliding a_g max.: 25.0 m/s²
- Acceleration, self-supporting a_f max.: 40.0 m/s²



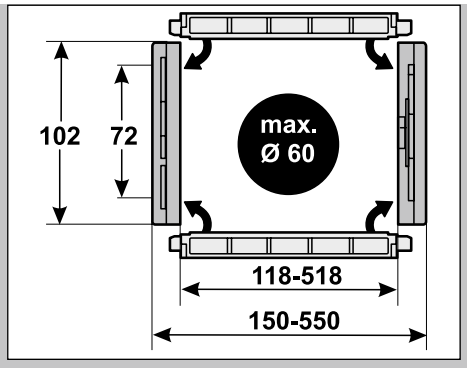
Cable drag chains sorted by interior height

MP Classic
MP 62.1
Page 274



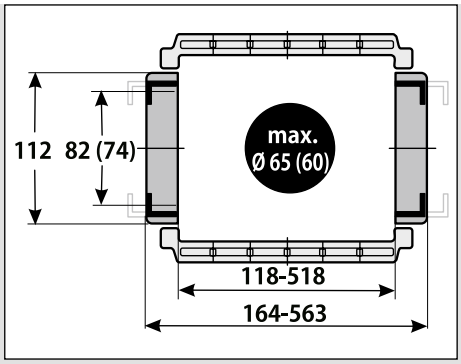
- Internal height: 62.0 mm
- Internal widths: 118.0 – 518.0 mm
- Radii: 150.0 – 500.0 mm
- Pitch: 100.0 mm
- Links per metre: 10 qty.
- Loading side: inside and outside flexure curve

MP Classic
MP 72
Page 286



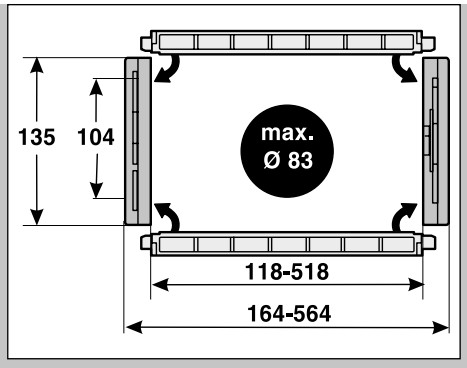
- Internal height: 72.0 mm
- Internal widths: 118.0 – 518.0 mm
- Radii: 150.0 – 500.0 mm
- Pitch: 100.0 mm
- Links per metre: 10 qty.
- Loading side: inside and outside flexure curve

HeavyLine
MP 82.2
MP 82.3
Page 216



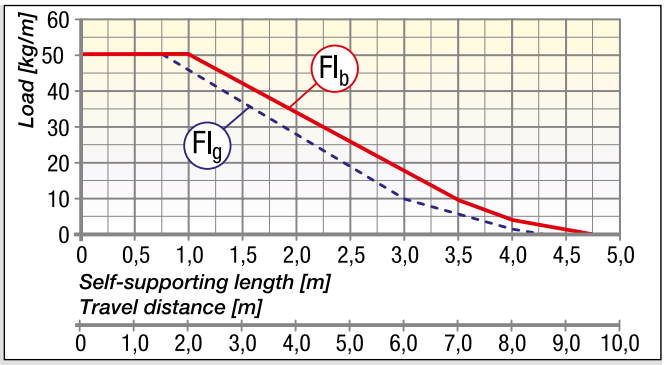
- Internal height: 82.0 mm
- Internal widths: 118.0 – 518.0 mm
- Radii: 150.0 – 650.0 mm
- Pitch: 118.0 mm
- Links per metre: 9 qty.
- Loading side: inside and outside flexure curve
- MP 82.3 inner widths 118–418 mm,
  radii 200–650 mm,
  lower inner height (values in brackets)

HeavyLine
MP 102.2
Page 228

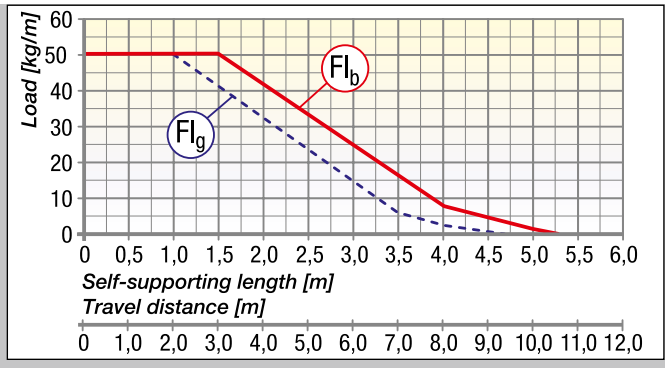


- Internal height: 104.0 mm
- Internal widths: 118.0 – 518.0 mm
- Radii: 250.0 – 500.0 mm
- Pitch: 141.0 mm
- Links per metre: 7 qty.
- Loading side: inside and outside flexure curve

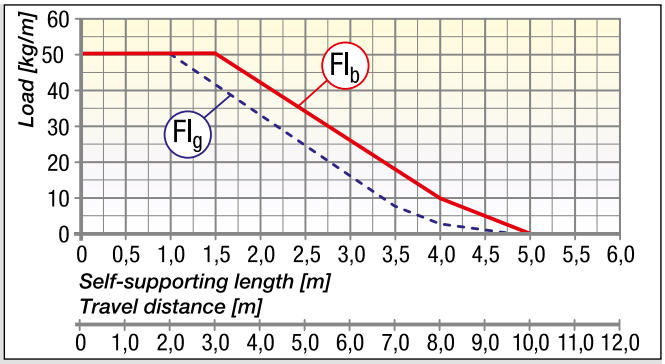
- Travel distance gliding L_g max.: 150.0 m
- Travel distance self-supporting L_f max.: see diagram
- Travel distance vertical, hanging L_{vh} max.: 65.0 m
- Travel distance vertical, upright L_{vs} max.: 6.0 m
- Rotated 90°, unsupported L_{90f} max.: 4.0 m
- Speed, gliding V_g max.: 5.0 m/s
- Speed, self-supporting V_f max.: 20.0 m/s
- Acceleration, gliding a_g max.: 25.0 m/s²
- Acceleration, self-supporting a_f max.: 40.0 m/s²



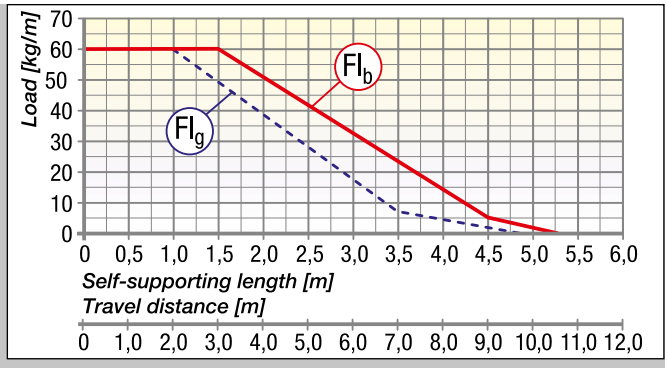
- Travel distance gliding L_g max.: 150.0 m
- Travel distance self-supporting L_f max.: see diagram
- Travel distance vertical, hanging L_{vh} max.: 80.0 m
- Travel distance vertical, upright L_{vs} max.: 6.0 m
- Rotated 90°, unsupported L_{90f} max.: 6.0 m
- Speed, gliding V_g max.: 5.0 m/s
- Speed, self-supporting V_f max.: 20.0 m/s
- Acceleration, gliding a_g max.: 25.0 m/s²
- Acceleration, self-supporting a_f max.: 40.0 m/s²



- 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.: 6.0 m
- Rotated 90°, unsupported L_{90f} max.: 3.0 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/s²
- Acceleration, self-supporting a_f max.: 40.0 m/s²



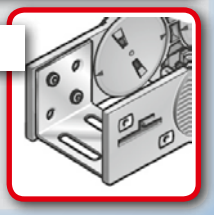
- Travel distance gliding L_g max.: 150.0 m
- Travel distance self-supporting L_f max.: see diagram
- Travel distance vertical, hanging L_{vh} max.: 80.0 m
- Travel distance vertical, upright L_{vs} max.: 8.0 m
- Rotated 90°, unsupported L_{90f} max.: 8.0 m
- Speed, gliding V_g max.: 5.0 m/s
- Speed, self-supporting V_f max.: 20.0 m/s
- Acceleration, gliding a_g max.: 25.0 m/s²
- Acceleration, self-supporting a_f max.: 40.0 m/s²

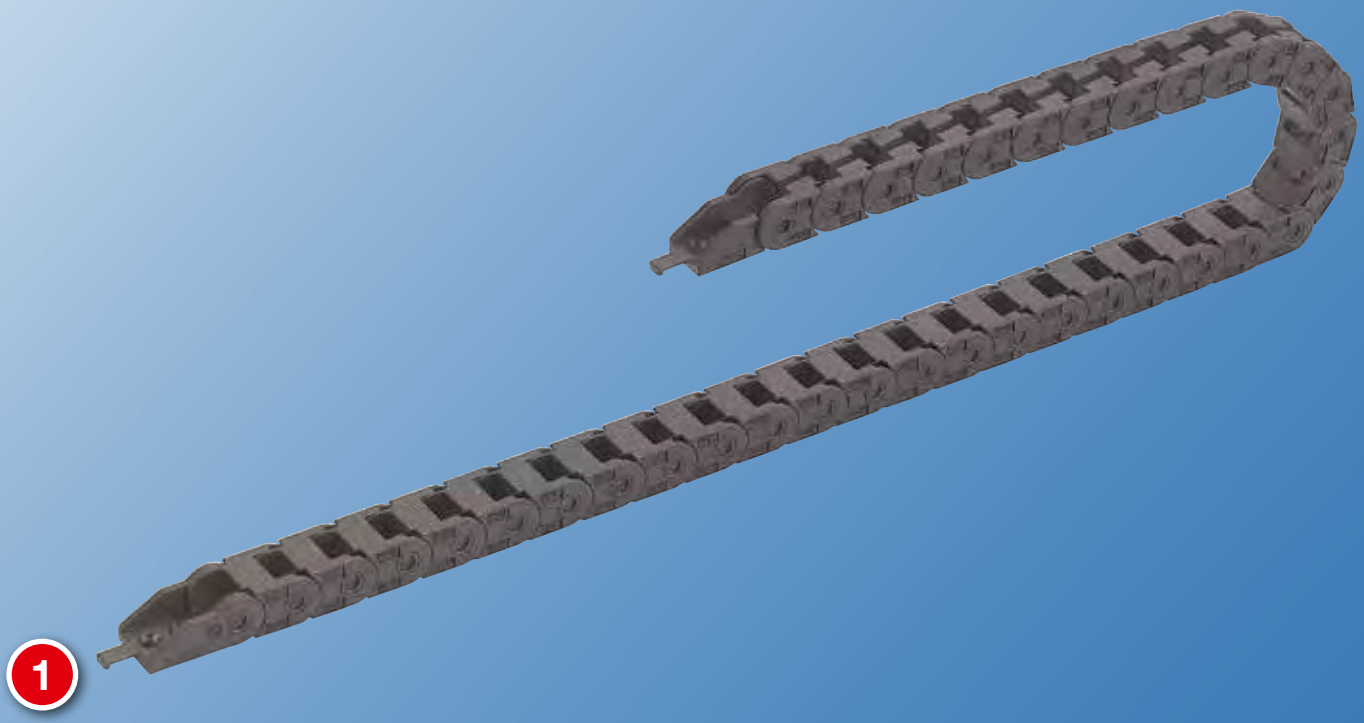


System overview

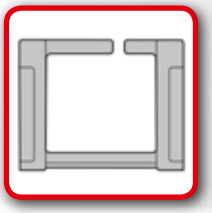
1 Chain bracket

Chain bracket U-part



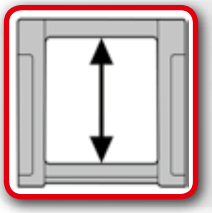


Technical data



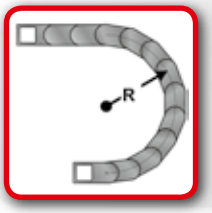
Loading side

outside flexure curve slitted



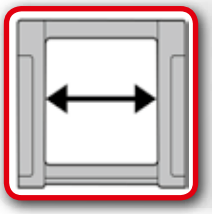
Available interior heights

10.0 mm



Available radii

18.0 – 58.0 mm



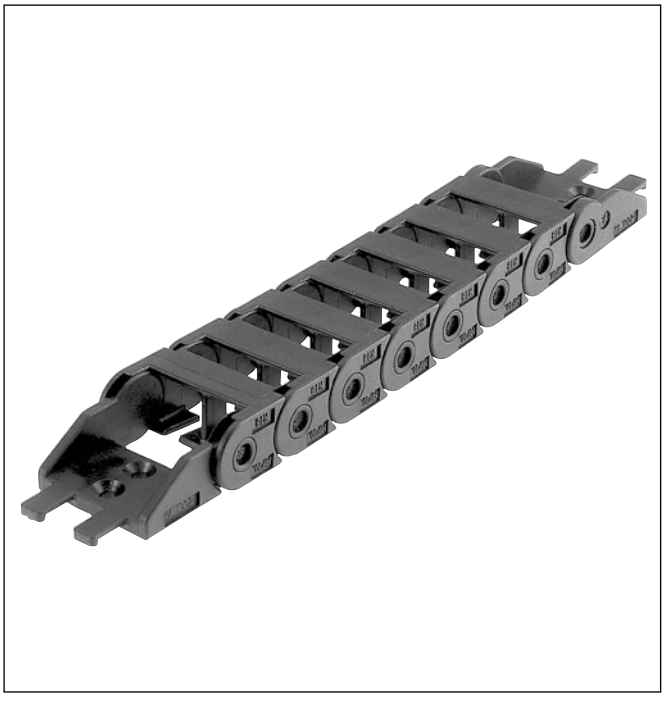
Available interior widths

6.0 – 41.0 mm

Ordering key

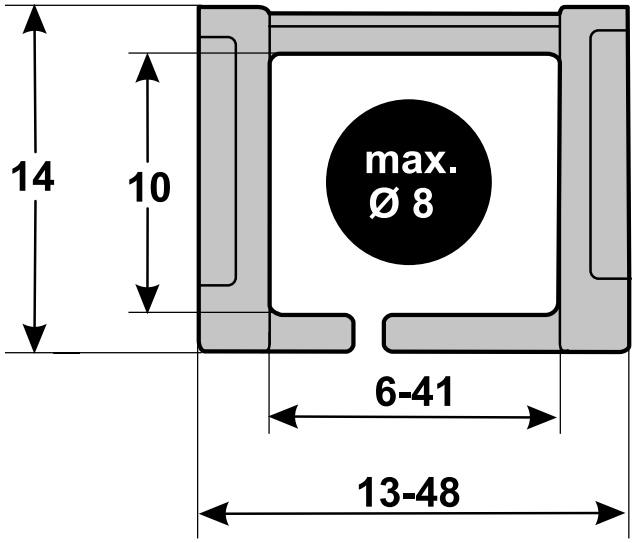
Type	Variation	Inside width mm	Outside width mm	Radius mm	Ridge version	Material	Chain length mm
0101	22	6 9 15 21 31 41	13 16 22 28 38 48	18 28 38 48 58	0	0 1 7 9	

Ordering key _



Chain link

Loading side: outside flexure curve slitted



Dimensions in mm

0	Standard (PA/black)
1	UL94/V0 (PA/oxide red)
7	ESD (PA/light grey)
9	Special version

0	PA full-ridged with bias

22	Frame bridge on outside of radius Frame bridge on inside of radius Slotted on outside of radius

Order sample: 0101 22 006 018 0 0 1065
Frame bridge in outside bend, frame bridge in inside bend, slitted in outside bend
Inside width 6 mm; radius 18 mm
Plastic bridge, full-ridged with bias, material black-coloured polyamide
Chain length 1065 mm (71 links)

Technical specifications

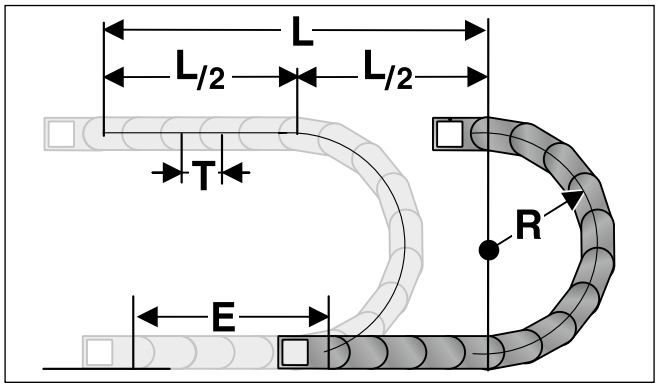
Travel distance gliding L_g max.:	10.0 m
Travel distance self-supporting L_f max.:	see diagram
Travel distance vertical, hanging L_{vh} max.:	2.0 m
Travel distance vertical, upright L_{vs} max.:	1.0 m
Rotated 90°, unsupported L_{90f} max.:	not recommended
Speed, gliding V_g max.:	2.0 m/s
Speed, self-supporting V_f max.:	4.0 m/s
Acceleration, gliding a_g max.:	2.0 m/s²
Acceleration, self-supporting a_f max.:	2.0 m/s²

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

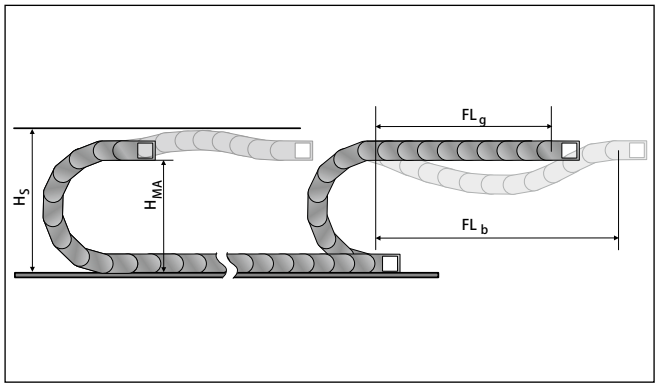


The fixed point of the cable drag chain should be connected in the middle of the travel distance.
This arrangement gives the shortest connection between the fixed point and the moving consumer and thus the most efficient chain length.

Chain length calculation = L/2 + π * R + 2 * T + E
≈ 1 m chain = x 15.0 mm links.

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

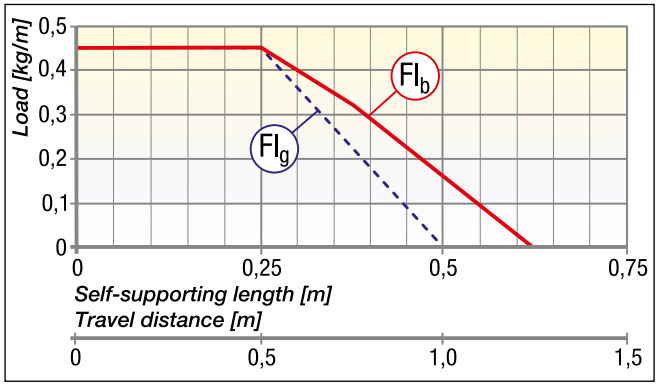
Self-supporting length



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

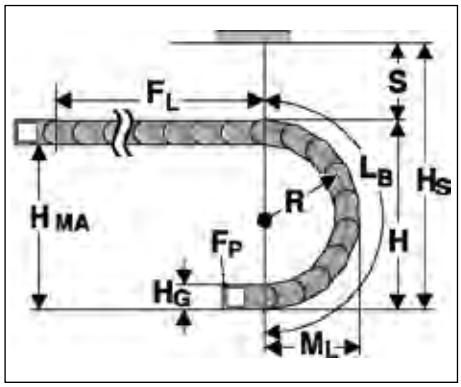
Load diagram for self-supporting applications



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

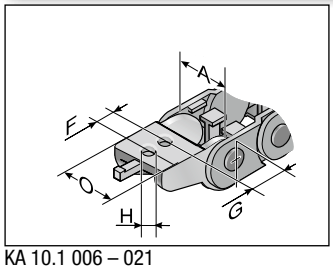
FL_b Self-supporting Length, upper run bent
In the FL_b range, the chain upper run has a sag of more than , but this is still less than the maximum sag.
Where the sag is greater than that permitted in the FL_b range, the application is critical and should be avoided. The self-supporting length can be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

Installation dimensions

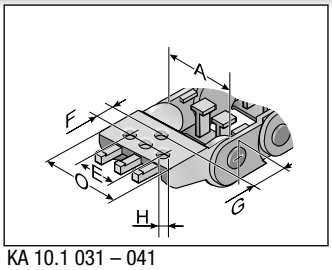


Radius R	18	28	38	48	58
Outside height of chain link (H_G)	14	14	14	14	14
Height of bend (H)	50	70	90	110	130
Height of moving end connection (H_{MA})	36	56	76	96	116
Safety margin (S)	10	10	10	10	10
Installation height (H_S)	60	80	100	120	140
Arc projection (M_L)	40	50	60	70	80
Bend length (L_B)	94	125	156	188	219

Chain bracket U-part



KA 10.1 006 – 021

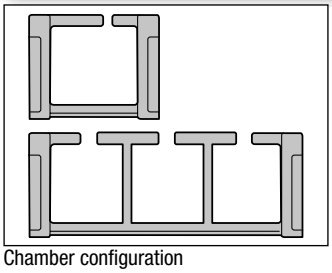


KA 10.1 031 – 041

The chain bracket is a fully plastic part. The bracket is precisely adjusted to the respective chain width and only needs to be snapped in at the chain link. Please order one male and one female end bracket for each chain. The brackets should be fastened with M3 screws. The cables or conduits may be fastened with cable ties on the integrated strain relief of the chain bracket.

Type	Order no.	Material	Inside width A mm	E mm	F mm	G mm	HØ mm	Outside width KA O mm
KA 10.1 006 male	010100005000	Plastic	6.0		8.0	11.0	3.2	A+7.0
KA 10.1 006 female	010100005100	Plastic	6.0		8.0	11.0	3.2	A+7.0
KA 10.1 009 male	010100005200	Plastic	9.0		8.0	11.0	3.2	A+7.0
KA 10.1 009 female	010100005300	Plastic	9.0		8.0	11.0	3.2	A+7.0
KA 10.1 015 male	010100005400	Plastic	15.0		8.0	11.0	3.2	A+7.0
KA 10.1 015 female	010100005500	Plastic	15.0		8.0	11.0	3.2	A+7.0
KA 10.1 021 male	010100005600	Plastic	21.0		8.0	11.0	3.2	A+7.0
KA 10.1 021 female	010100005700	Plastic	21.0		8.0	11.0	3.2	A+7.0
KA 10.1 031 male	010100005800	Plastic	31.0	A-9.0	8.0	11.0	3.2	A+7.0
KA 10.1 031 female	010100005900	Plastic	31.0	A-9.0	8.0	11.0	3.2	A+7.0
KA 10.1 041 male	010100006000	Plastic	41.0	A-9.0	8.0	11.0	3.2	A+7.0
KA 10.1 041 female	010100006100	Plastic	41.0	A-9.0	8.0	11.0	3.2	A+7.0

Chamber size

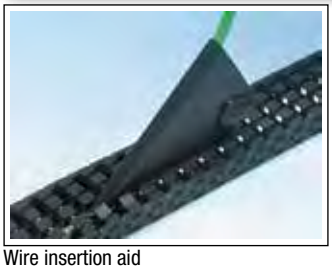


Chamber configuration

Depending on chain width, the MP10.1 is fitted with one, two, three or four chambers. This system of chambers enables cabling to be laid separately.

Type	Number of chambers qty.	Chamber width mm
10.1 006	1	6.5
10.1 009	1	9.5
10.1 015	1	15.5
10.1 021	2	9.5
10.1 031	3	9.5
10.1 041	4	9.0

Wire insertion aid

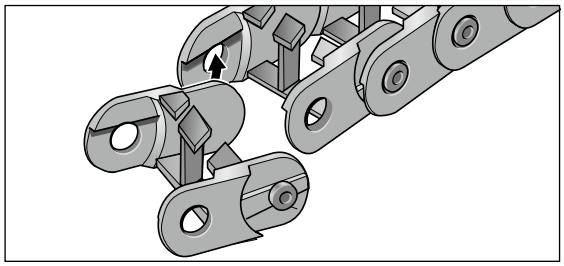


Wire insertion aid

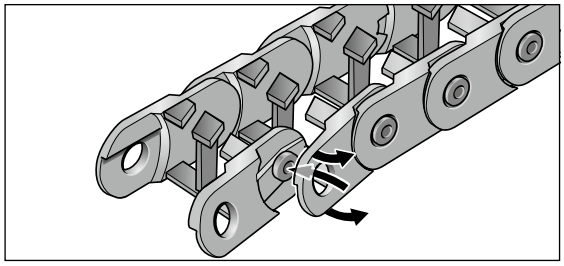
The wire insertion tool allows for quick and simple installation of cables and hoses into the cable drag chain.

Type	Order no.
KE	83729010

Assembly

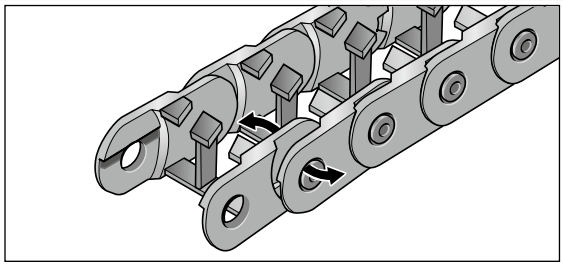


Step 1

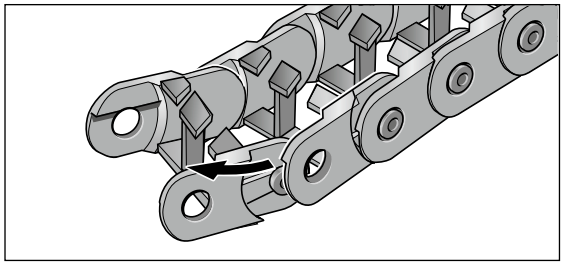


Step 2

Disassembly



Step 1

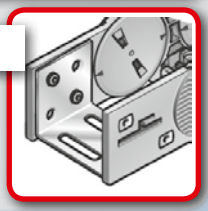


Step 2

System overview

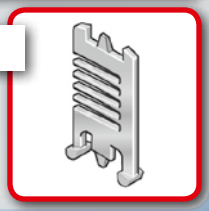
1 Chain bracket

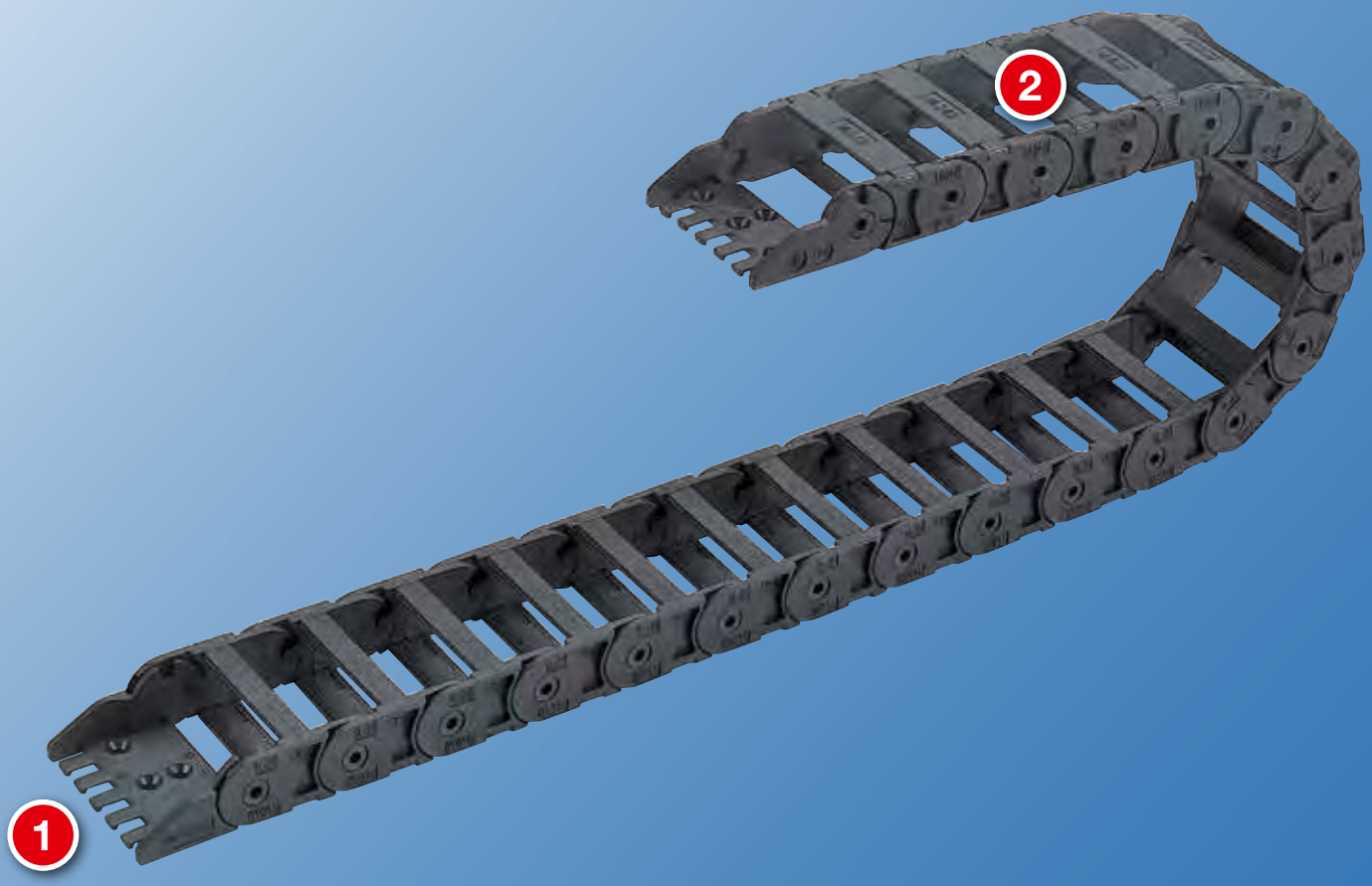
Chain bracket U-part



2 Shelving system

Separator TR

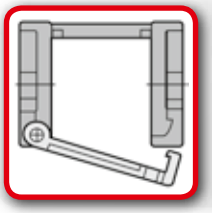




Guide channels

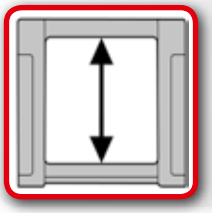
Aluminium VAW

Technical data



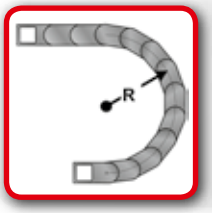
Loading side

outside flexure curve



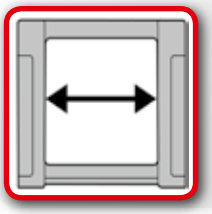
Available interior heights

14.0 mm



Available radii

25.0 – 75.0 mm



Available interior widths

16.0 – 40.0 mm

MultiLine
MP 14

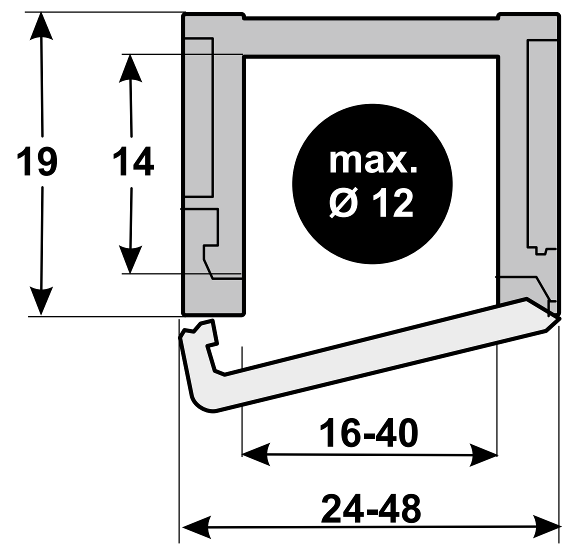
Ordering key

Type	Variation	Inside width mm	Outside width mm	Radius mm	Ridge version	Material	Chain length mm
0140	01	16 20 30 40	24 28 38 48	25 38 48 75	0	0 9	

Ordering key _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

Chain link

Loading side: outside flexure curve



Dimensions in mm

0 Standard (PA/black)
9 Special version

0 PA full-ridged
with bias

01 Frame bridge on outside of radius
Frame bridge on inside of radius
Opens on outside of radius

Order sample: 0140 01 020 048 0 0 988
Frame bridge in inside and outside bend; can be opened in outside bend
Inside width 20 mm; radius 48 mm
Full-ridged with bias, material black-coloured polyamide
Chain length 988 mm (38 links)

Technical specifications

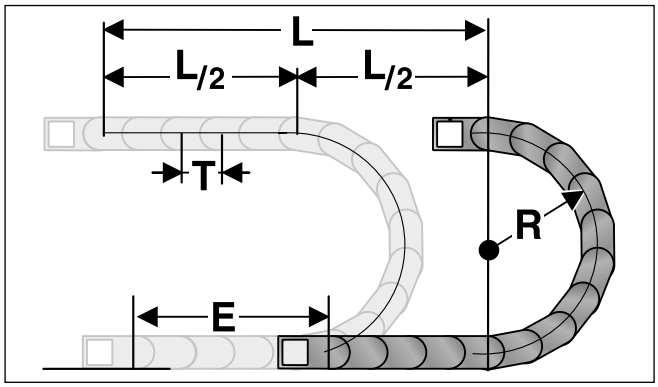
Travel distance gliding L_g max.:	12.0 m
Travel distance self-supporting L_f max.:	see diagram
Travel distance vertical, hanging L_{vh} max.:	3.0 m
Travel distance vertical, upright L_{vs} max.:	2.0 m
Rotated 90°, unsupported L_{90f} max.:	not recommended
Speed, gliding V_g max.:	2.0 m/s
Speed, self-supporting V_f max.:	4.0 m/s
Acceleration, gliding a_g max.:	2.0 m/s²
Acceleration, self-supporting a_f max.:	2.0 m/s²

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

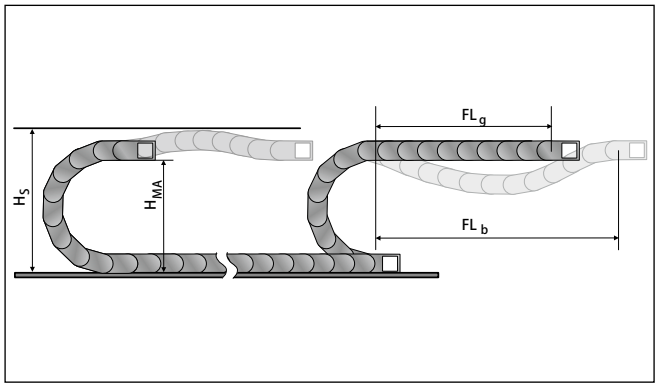


The fixed point of the cable drag chain should be connected in the middle of the travel distance.
This arrangement gives the shortest connection between the fixed point and the moving consumer and thus the most efficient chain length.

Chain length calculation = L/2 + π * R + 2 * T + E
≈ 1 m chain = x 26.0 mm links.

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

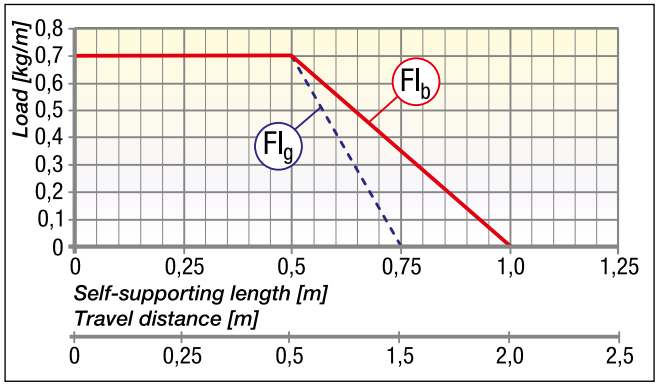
Self-supporting length



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

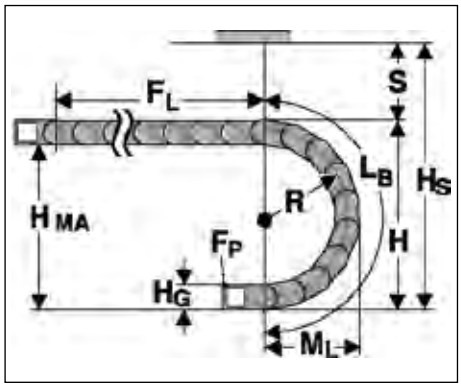
Load diagram for self-supporting applications



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

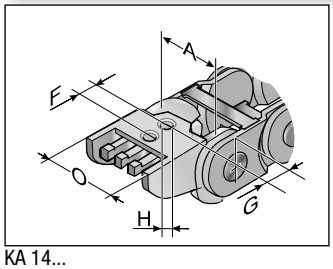
FL_b Self-supporting Length, upper run bent
In the FL_b range, the chain upper run has a sag of more than , but this is still less than the maximum sag.
Where the sag is greater than that permitted in the FL_b range, the application is critical and should be avoided. The self-supporting length can be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

Installation dimensions

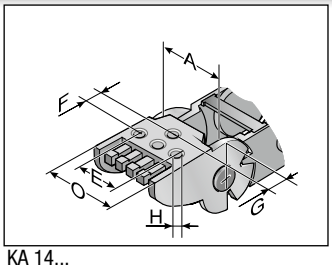


Radius R	25	38	48	75
Outside height of chain link (H_G)	19	19	19	19
Height of bend (H)	69	95	115	169
Height of moving end connection (H_{MA})	50	76	96	150
Safety margin (S)	20	20	20	20
Installation height (H_S)	89	115	135	189
Arc projection (M_L)	61	74	84	111
Bend length (L_B)	134	175	207	291

Chain bracket U-part



KA 14...

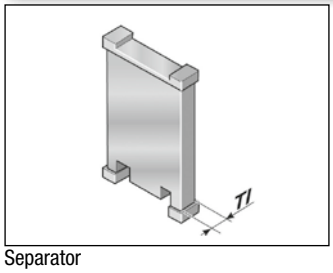


KA 14...

The chain bracket is a fully plastic part. The bracket is precisely adjusted to the respective chain width and only needs to be snapped in at the chain link. Please order one male and one female end bracket for each chain. The brackets should be fastened with M3 screws. The cables or conduits may be fastened with cable ties on the integrated strain relief of the chain bracket.

Type	Order no.	Material	Inside width A mm	E mm	F mm	G mm	HØ mm	Outside width KA O mm
KA 14016 male	014000005000	Plastic	16.0		8.0	11.0	3.2	A+8.0
KA 14016 female	014000005100	Plastic	16.0		8.0	7.5	3.2	A+8.0
KA 14020 male	014000005200	Plastic	20.0		8.0	11.0	3.2	A+8.0
KA 14020 female	014000005300	Plastic	20.0		8.0	7.5	3.2	A+8.0
KA 14030 male	014000005400	Plastic	30.0	A-8.0	8.0	11.0	3.2	A+8.0
KA 14030 female	014000005500	Plastic	30.0	A-8.0	8.0	7.5	3.2	A+8.0
KA 14040 male	014000005600	Plastic	40.0	A-8.0	8.0	11.0	3.2	A+8.0
KA 14040 female	014000005700	Plastic	40.0	A-8.0	8.0	7.5	3.2	A+8.0

Separator

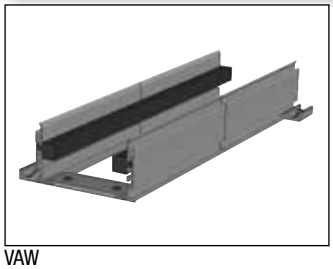


Separator

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	Tl mm
TR 14	014000009200	Separator	1.5

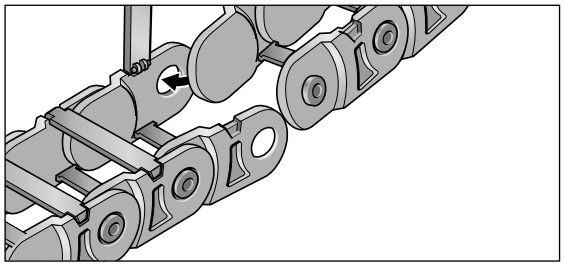
Guide channels (VAW)



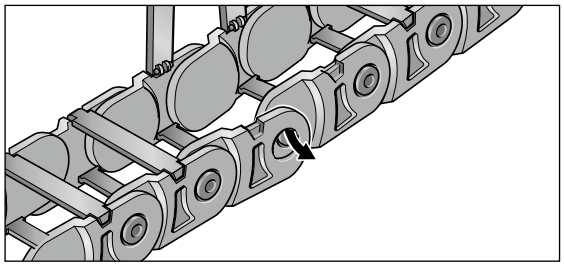
VAW

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“.

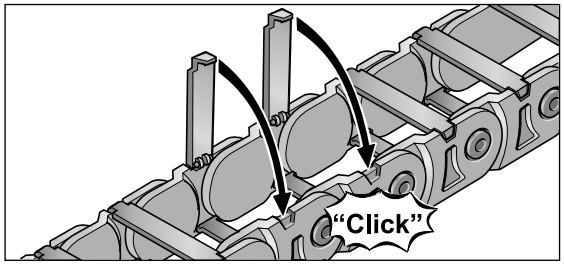
Assembly



Step 1

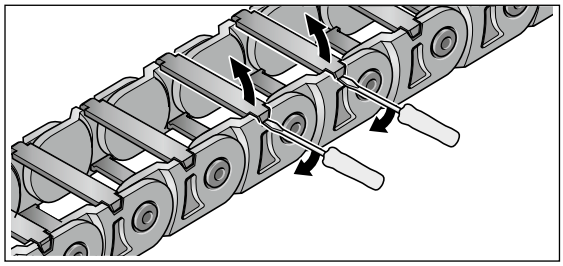


Step 2

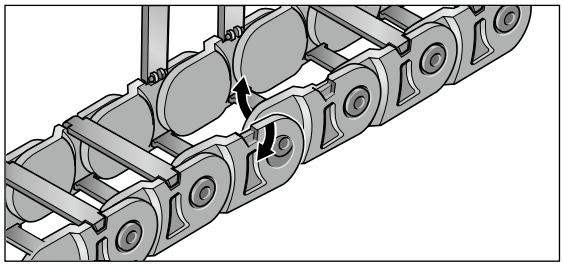


Step 3

Disassembly



Step 1

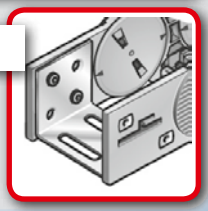


Step 2

System overview

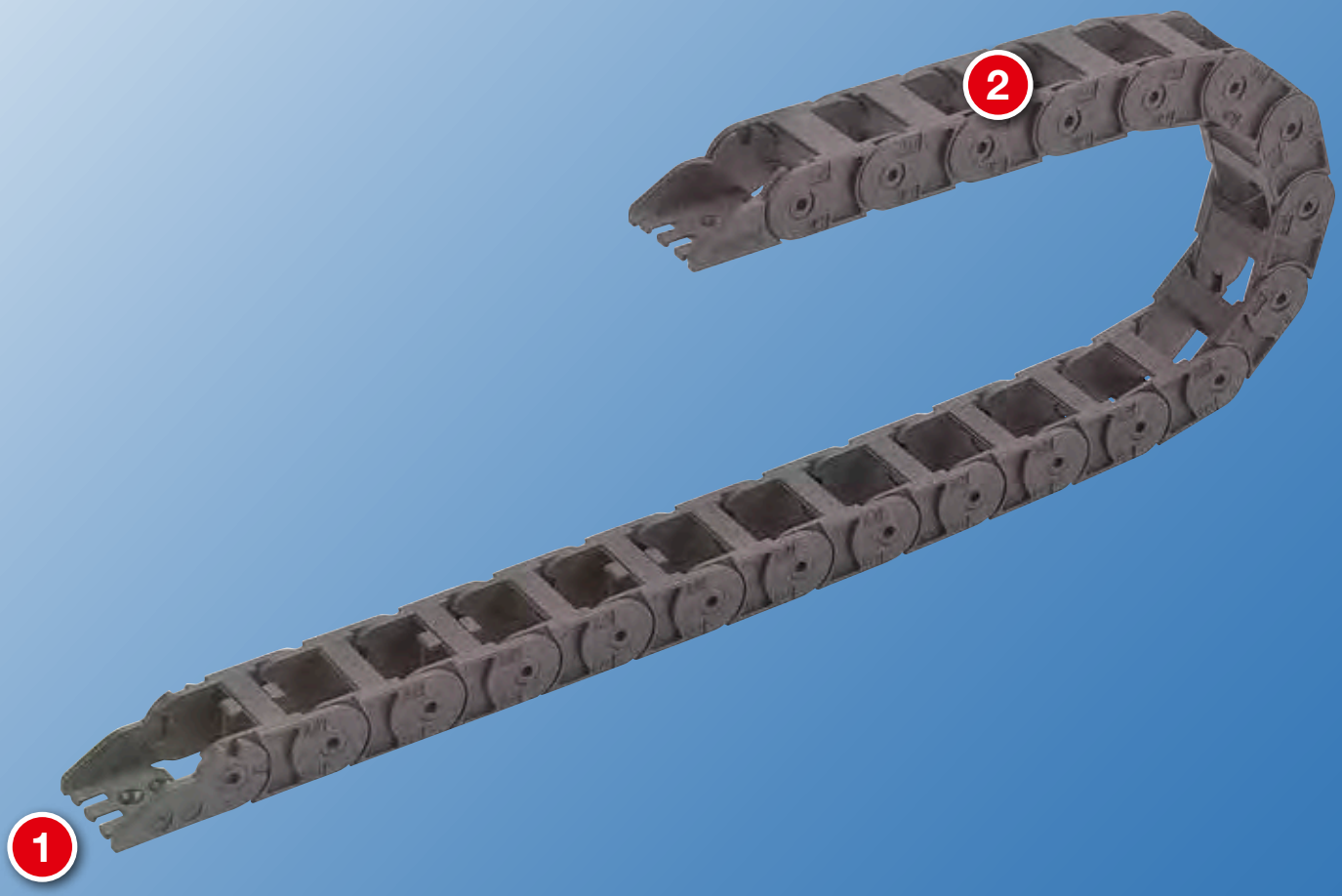
1 Chain bracket

Chain bracket U-part

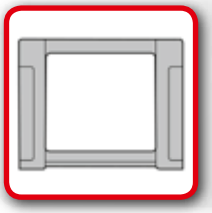


Guide channels

Aluminium VAW

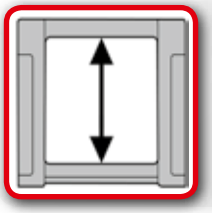


Technical data



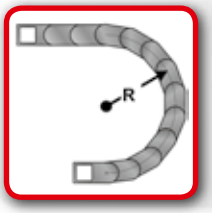
Loading side

Non-opening



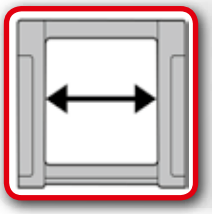
Available interior heights

14.0 mm



Available radii

25.0 – 75.0 mm



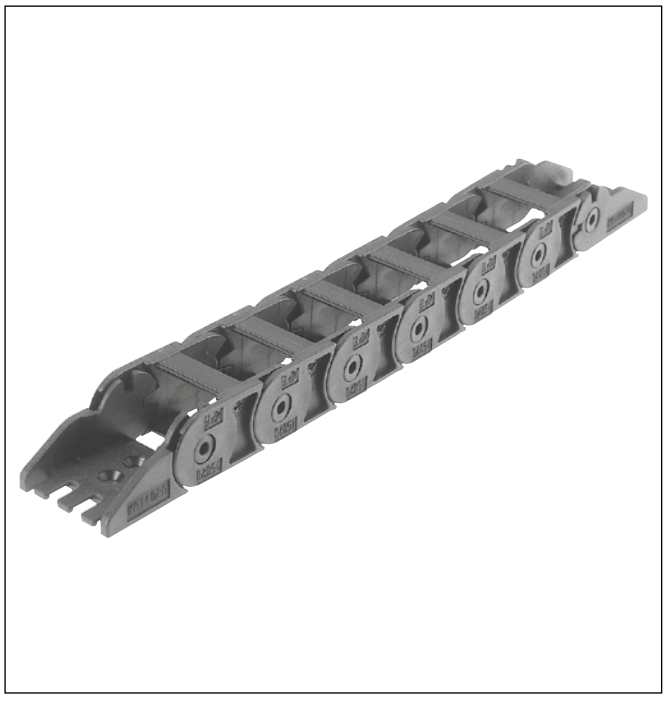
Available interior widths

16.0 – 40.0 mm

Ordering key

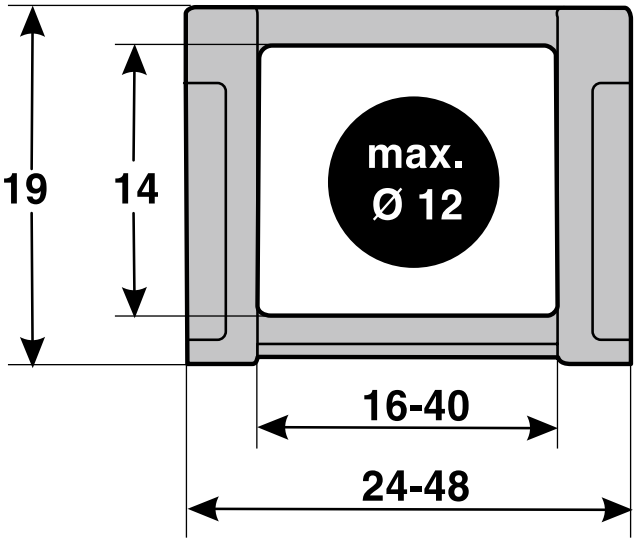
Type	Variation	Inside width mm	Outside width mm	Radius mm	Ridge version	Material	Chain length mm
0150	34	16 20 30 40	24 28 38 48	25 38 48 75	0	0 1 7 9	

Ordering key _



Chain link

Loading side: Non-opening



Dimensions in mm

0	Standard (PA/black)
1	UL94/V0 (PA/oxide red)
7	ESD (PA/light grey)
9	Special version

0	PA full-ridged with bias

34	Frame bridge on outside of radius Frame bridge on inside of radius Non-opening

Order sample: 0150 34 016 025 0 0 1092
Frame bridge in outside bend, frame bridge in inside bend, cannot be opened
Inside width 16 mm; radius 25 mm
Plastic bridge, full-ridged with bias, material black-coloured polyamide
Chain length 1092 mm (42 links)

Technical specifications

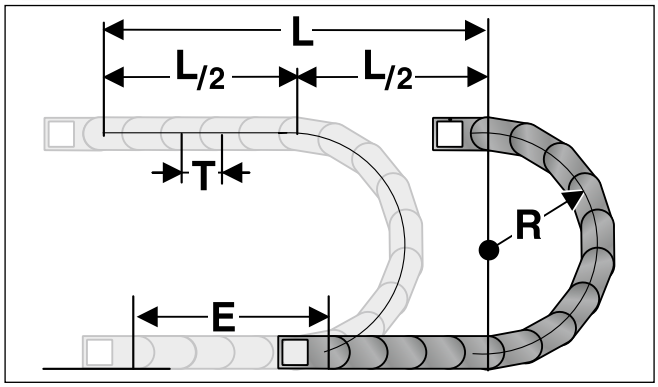
Travel distance gliding L_g max.:	12.0 m
Travel distance self-supporting L_f max.:	see diagram
Travel distance vertical, hanging L_{vh} max.:	3.0 m
Travel distance vertical, upright L_{vs} max.:	2.0 m
Rotated 90°, unsupported L_{90f} max.:	not recommended
Speed, gliding V_g max.:	2.0 m/s
Speed, self-supporting V_f max.:	4.0 m/s
Acceleration, gliding a_g max.:	2.0 m/s²
Acceleration, self-supporting a_f max.:	2.0 m/s²

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

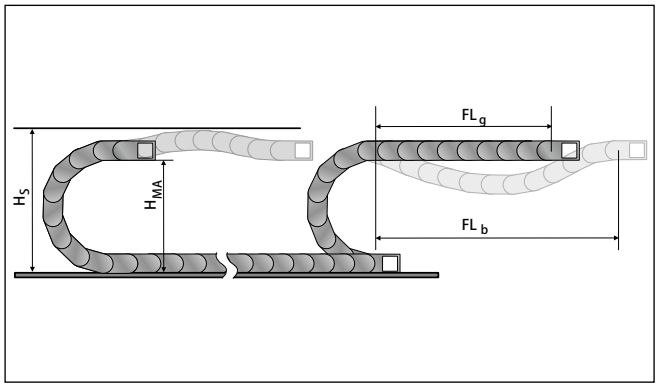


The fixed point of the cable drag chain should be connected in the middle of the travel distance.
This arrangement gives the shortest connection between the fixed point and the moving consumer and thus the most efficient chain length.

Chain length calculation = L/2 + π * R + 2 * T + E
≈ 1 m chain = x 26.0 mm links.

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

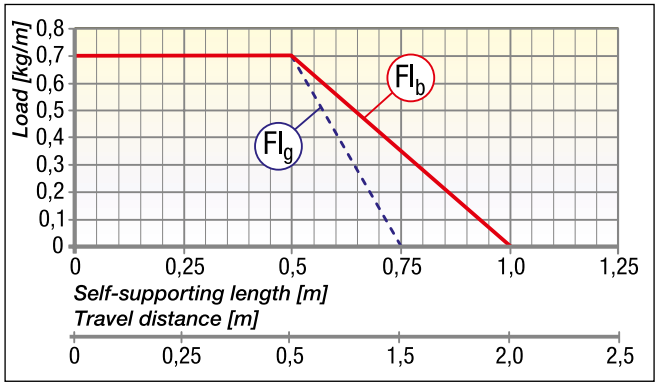
Self-supporting length



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

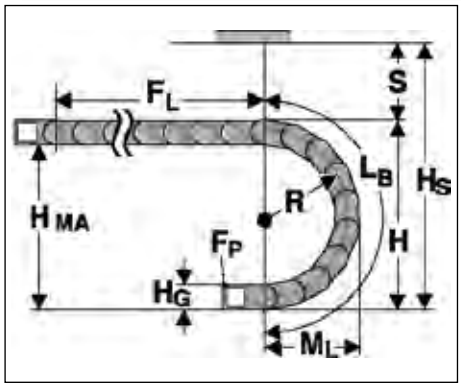
Load diagram for self-supporting applications



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

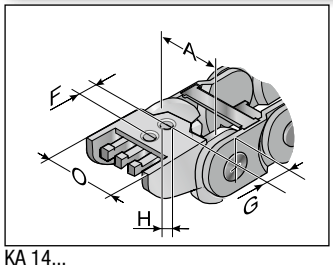
FL_b Self-supporting Length, upper run bent
In the FL_b range, the chain upper run has a sag of more than , but this is still less than the maximum sag.
Where the sag is greater than that permitted in the FL_b range, the application is critical and should be avoided. The self-supporting length can be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

Installation dimensions

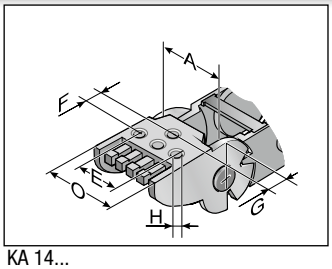


Radius R	25	38	48	75
Outside height of chain link (H_G)	19	19	19	19
Height of bend (H)	69	95	115	169
Height of moving end connection (H_{MA})	50	76	96	150
Safety margin (S)	20	20	20	20
Installation height (H_S)	89	115	135	189
Arc projection (M_L)	61	74	84	111
Bend length (L_B)	134	175	207	291

Chain bracket U-part



KA 14...

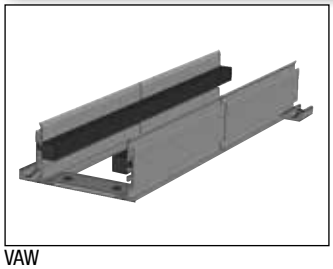


KA 14...

The chain bracket is a fully plastic part. The bracket is precisely adjusted to the respective chain width and only needs to be snapped in at the chain link. Please order one male and one female end bracket for each chain. The brackets should be fastened with M3 screws. The cables or conduits may be fastened with cable ties on the integrated strain relief of the chain bracket.

Type	Order no.	Material	Inside width A mm	E mm	F mm	G mm	HØ mm	Outside width KA O mm
KA 14016 male	014000005000	Plastic	16.0		8.0	11.0	3.2	A+8.0
KA 14016 female	014000005100	Plastic	16.0		8.0	7.5	3.2	A+8.0
KA 14020 male	014000005200	Plastic	20.0		8.0	11.0	3.2	A+8.0
KA 14020 female	014000005300	Plastic	20.0		8.0	7.5	3.2	A+8.0
KA 14030 male	014000005400	Plastic	30.0	A-8.0	8.0	11.0	3.2	A+8.0
KA 14030 female	014000005500	Plastic	30.0	A-8.0	8.0	7.5	3.2	A+8.0
KA 14040 male	014000005600	Plastic	40.0	A-8.0	8.0	11.0	3.2	A+8.0
KA 14040 female	014000005700	Plastic	40.0	A-8.0	8.0	7.5	3.2	A+8.0

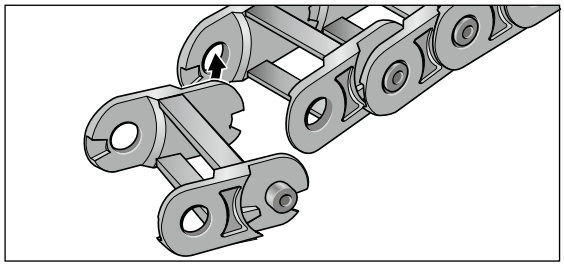
Guide channels (VAW)



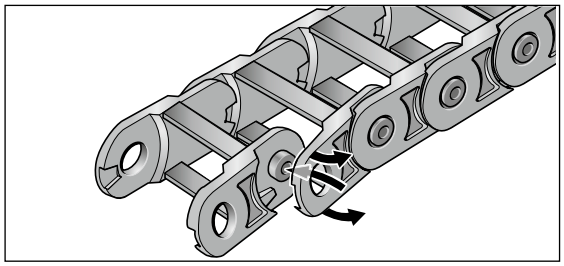
VAW

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

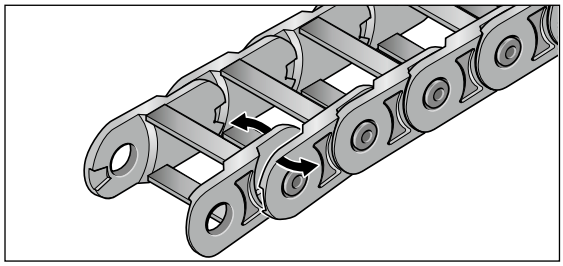


Step 1

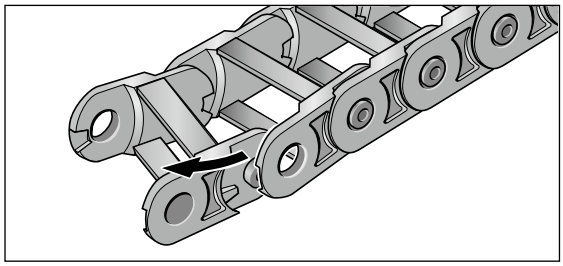


Step 2

Disassembly



Step 1

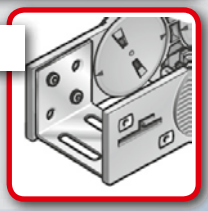


Step 2

System overview

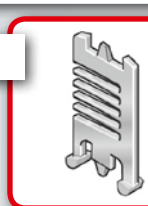
1 Chain bracket

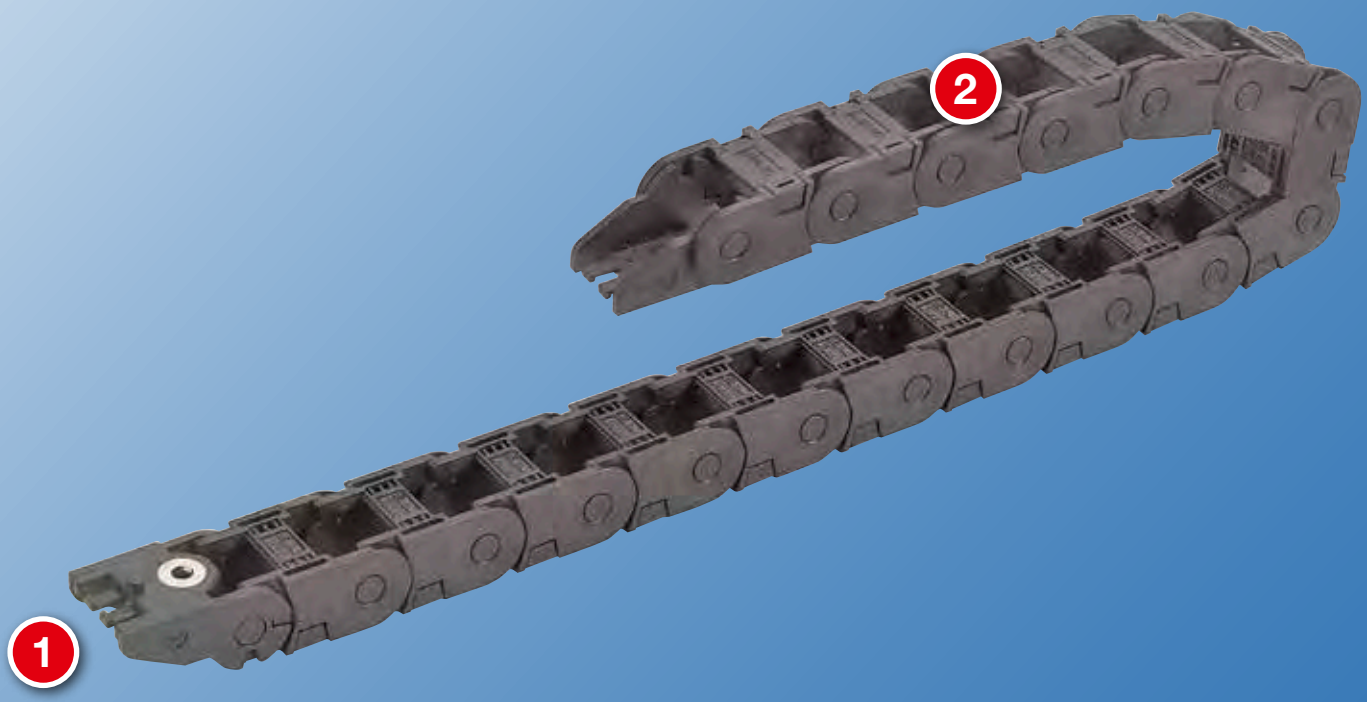
Chain bracket U-part



2 Shelving system

Separator TR

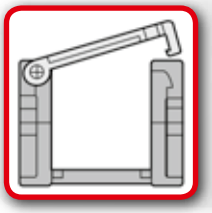




Guide channels

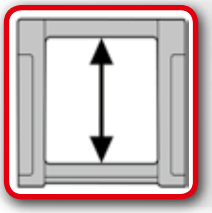
Aluminium VAW

Technical data



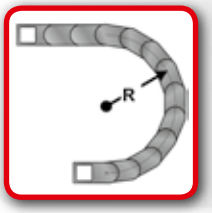
Loading side

Inside or outside flexure curve



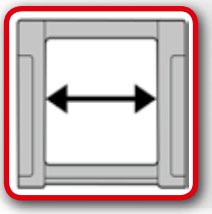
Available interior heights

18.0 mm



Available radii

28.0 – 78.0 mm



Available interior widths

15.0 – 70.0 mm

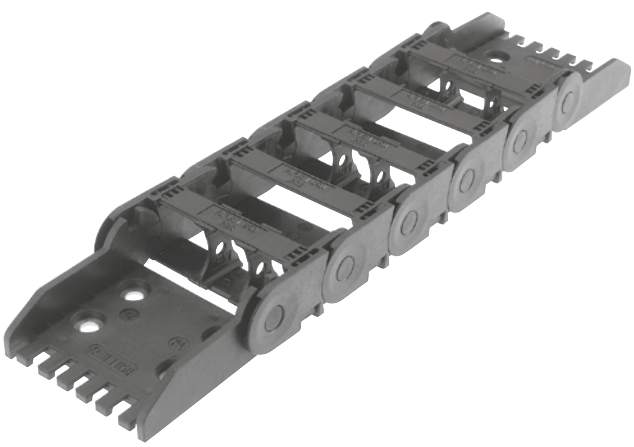
MultiLine
MP 18.1
MP 18.2

Ordering key

Type	Variation	Inside width mm	Outside width mm	Radius mm	Ridge version	Material	Chain length mm
0181 0182	01[1)] 02[2)]	15 18 25 37 50 70	28 31 38 50 63 83	28 38 48 78	0	0 1 5 7 9	

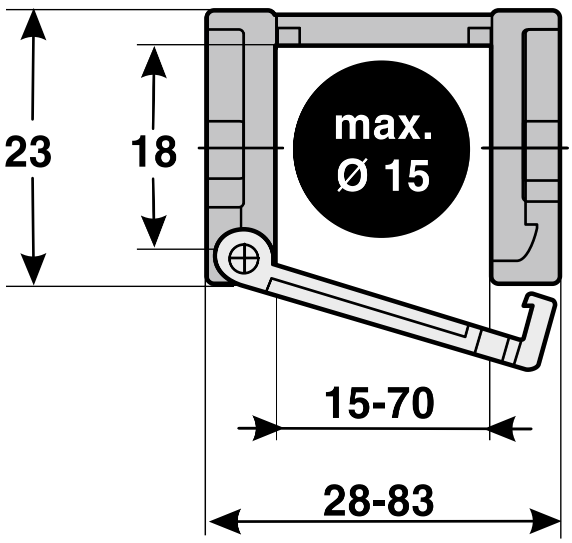
[1)] for Type 0181 only
[2)] for Type 0182 only

Ordering key _ _ _ _   _ _   _ _ _   _ _ _   _   _   _ _ _ _ _ _



Chain link

Loading side: Inside or outside flexure curve



Dimensions in mm

0 Standard (PA/black)
1 UL94/V0 (PA/oxide red)
5 Polypropylene (PP/blue)
7 ESD (PA/light grey)
9 Special version

0 PA full-ridged with bias

01 Frame bridge on outside of radius
Frame bridge on inside of radius
Opens on outside of radius
02 Frame bridge on outside of radius
Frame bridge on inside of radius
Opens on inside of radius

Order sample: 0181 01 015 028 0 0 1122
Frame bridge in outside bend, frame bridge in inside bend, can be opened from outside bend
Inside width 15 mm; radius 28 mm
Plastic bridge, full-ridged with bias, material black-coloured polyamide
Chain length 1122 mm (34 links)

Technical specifications

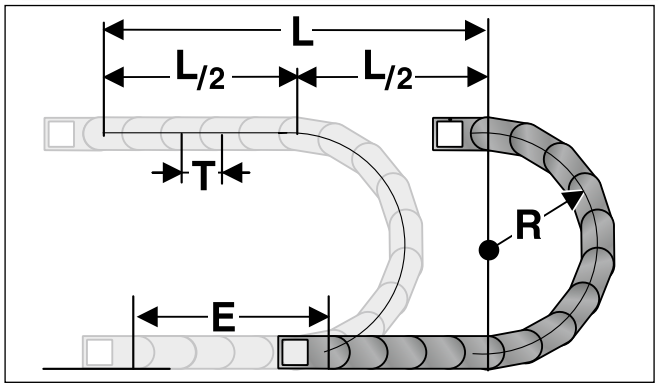
Travel distance gliding L_g max.:	20.0 m
Travel distance self-supporting L_f max.:	see diagram
Travel distance vertical, hanging L_{vh} max.:	8.0 m
Travel distance vertical, upright L_{vs} max.:	3.0 m
Rotated 90°, unsupported L_{90f} max.:	0.5 m
Speed, gliding V_g max.:	2.0 m/s
Speed, self-supporting V_f max.:	5.0 m/s
Acceleration, gliding a_g max.:	5.0 m/s²
Acceleration, self-supporting a_f max.:	5.0 m/s²

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:	UL 94 HB

Other material properties on request.

Determining the chain length

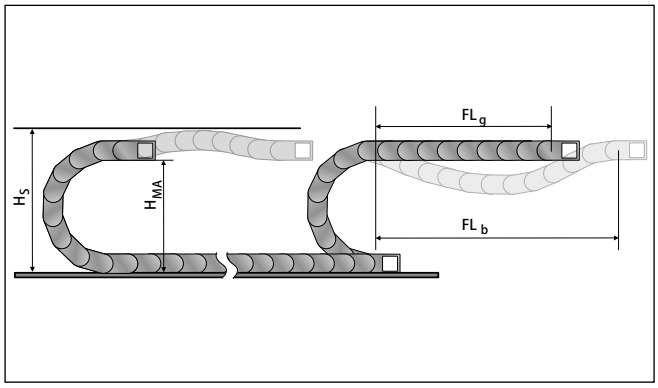


The fixed point of the cable drag chain should be connected in the middle of the travel distance.
This arrangement gives the shortest connection between the fixed point and the moving consumer and thus the most efficient chain length.

Chain length calculation = L/2 + π * R + 2 * T + E
≈ 1 m chain = x 33.0 mm links.

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

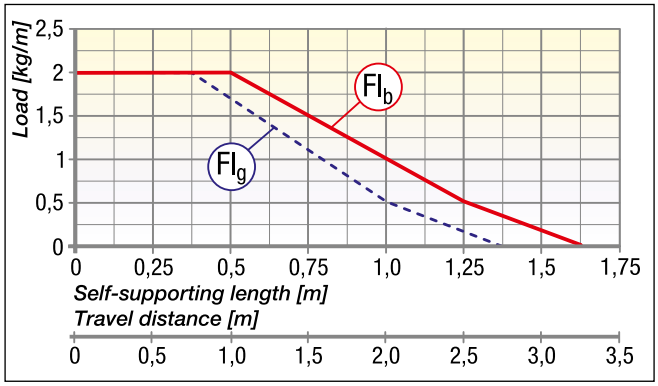
Self-supporting length



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

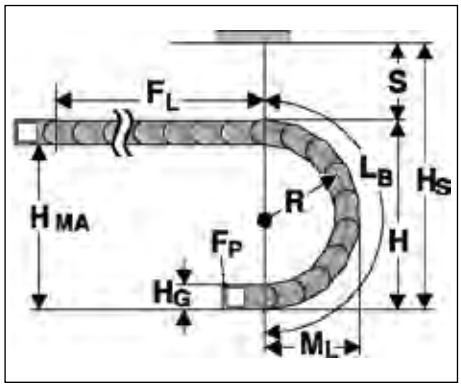
Load diagram for self-supporting applications



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

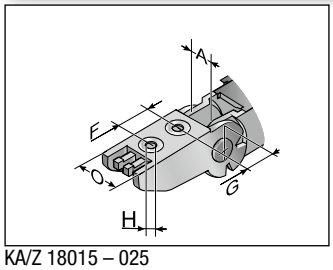
FL_b Self-supporting Length, upper run bent
In the FL_b range, the chain upper run has a sag of more than , but this is still less than the maximum sag.
Where the sag is greater than that permitted in the FL_b range, the application is critical and should be avoided. The self-supporting length can be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

Installation dimensions

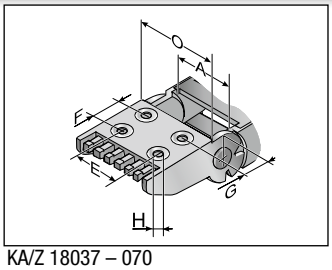


Radius R	28	38	48	78
Outside height of chain link (H_G)				
Height of bend (H)	79	99	119	179
Height of moving end connection (H_{MA})	56	76	96	156
Safety margin (S)	30	30	30	30
Installation height (H_S)	109	129	149	209
Arc projection (M_L)	73	83	93	123
Bend length (L_B)	157	188	220	314

Chain bracket U-part



KA/Z 18015 – 025

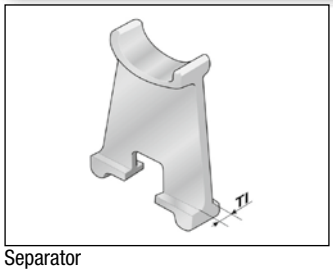


KA/Z 18037 – 070

The chain bracket is an all-plastic part with an extrusion-coated metal insert. The bracket is precisely adjusted to the respective chain width and only needs to be snapped in at the chain link. Please order one male and one female end bracket for each chain. The brackets should be fastened with M5 screws. The cables or conduits may be fastened with cable ties on the integrated strain relief of the chain bracket.

Type	Order no.	Material	Inside width A mm	E mm	F mm	G mm	HØ mm	Outside width KA O mm
KA/Z 18015 male	018100004800	Plastic	15.4		19.0	10.5	5.5	A+13.0
KA/Z 18015 female	018100004900	Plastic	15.4		19.0	8.5	5.5	A+13.0
KA/Z 18018 male	018100005000	Plastic	18.4		19.0	10.5	5.5	A+13.0
KA/Z 18018 female	018100005100	Plastic	18.4		19.0	8.5	5.5	A+13.0
KA/Z 18025 male	018100005200	Plastic	25.4		19.0	10.5	5.5	A+13.0
KA/Z 18025 female	018100005300	Plastic	25.4		19.0	8.5	5.5	A+13.0
KA/Z 18037 male	018100005400	Plastic	37.4	A-17.4	19.0	10.5	5.5	A+13.0
KA/Z 18037 female	018100005500	Plastic	37.4	A-17.4	19.0	8.5	5.5	A+13.0
KA/Z 18050 male	018100005600	Plastic	50.4	A-16.4	19.0	10.5	5.5	A+13.0
KA/Z 18050 female	018100005700	Plastic	50.4	A-16.4	19.0	8.5	5.5	A+13.0
KA/Z 18070 male	018100005800	Plastic	70.4	A-22.4	19.0	10.5	5.5	A+13.0
KA/Z 18070 female	018100005900	Plastic	70.4	A-22.4	19.0	8.5	5.5	A+13.0

Separator

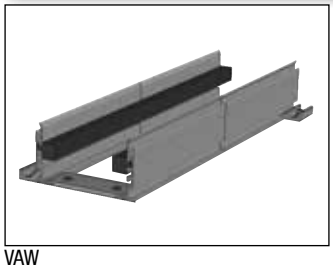


Separator

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	TI mm
TR 14/18	018200009000	Separator	1.5

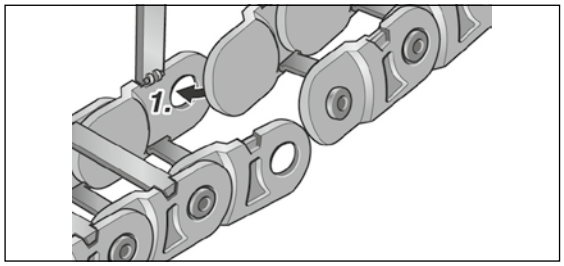
Guide channels (VAW)



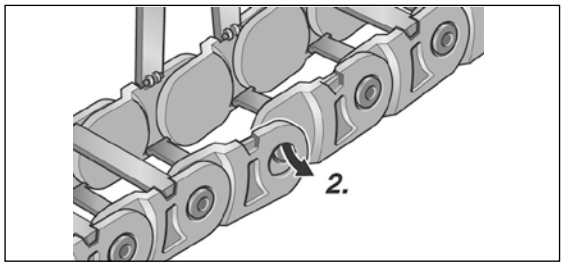
VAW

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“.

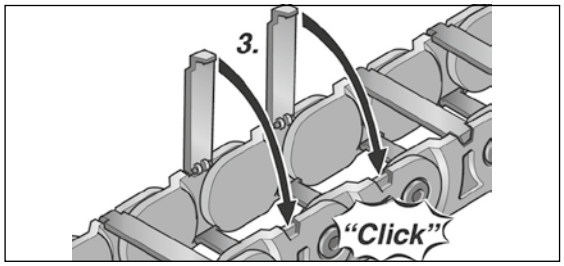
Assembly



Step 1

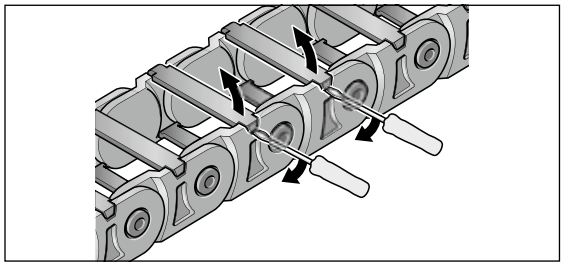


Step 2

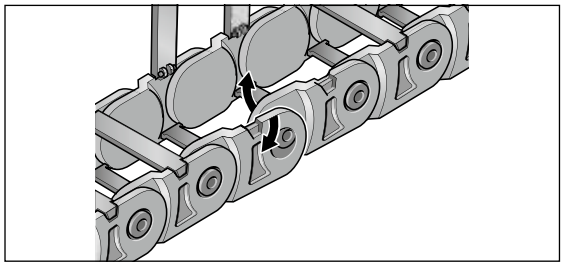


Step 3

Disassembly



Step 1

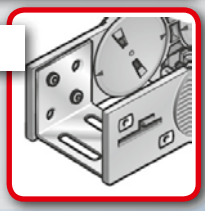


Step 2

System overview

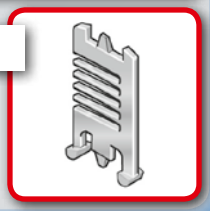
1 Chain bracket

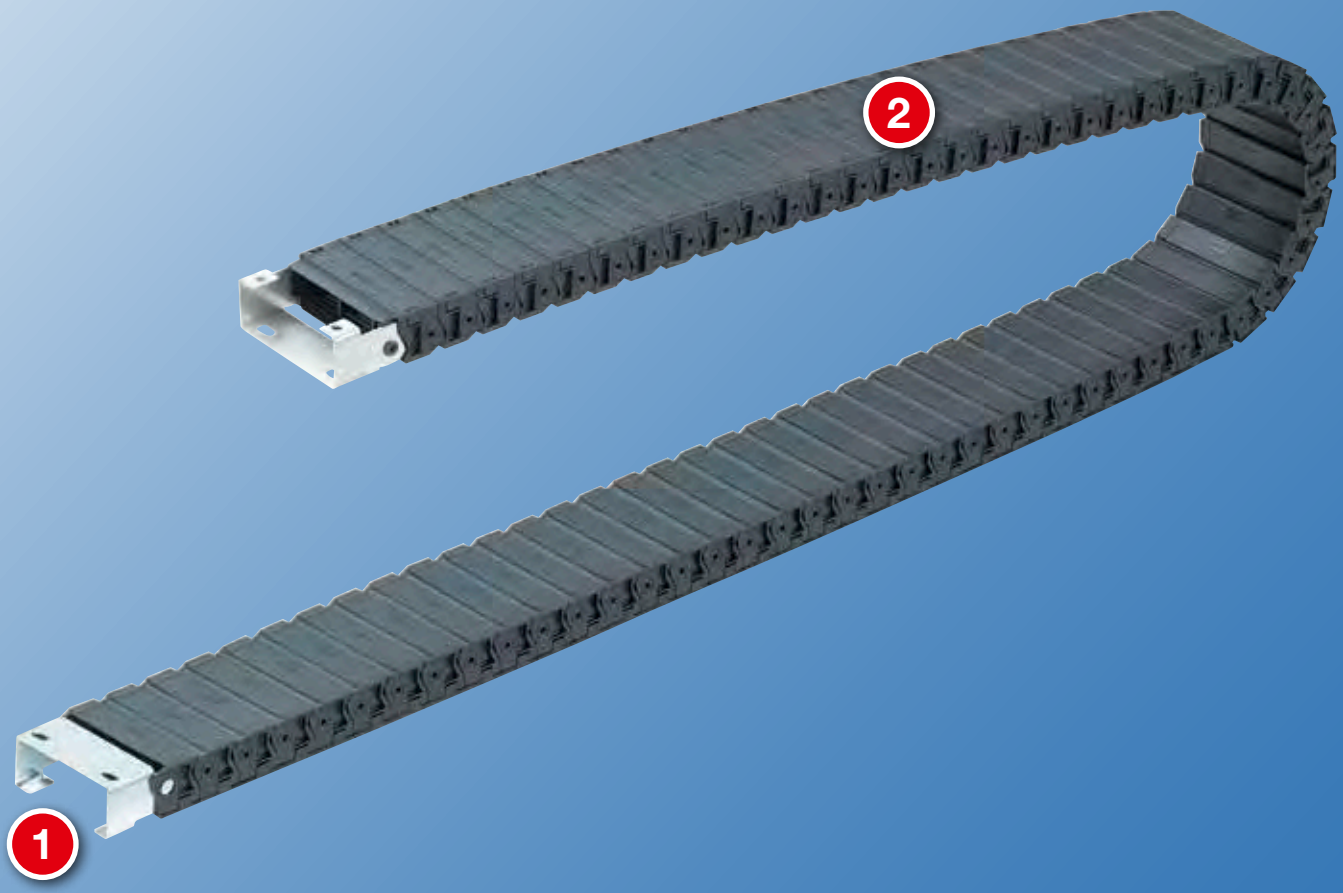
Chain bracket U-part



2 Shelving system

Separator TR



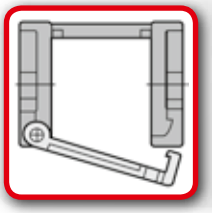


Guide channels

Aluminium VAW

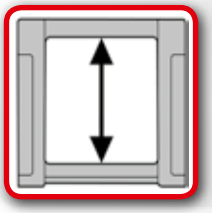
Stainless steel VAW-E

Technical data



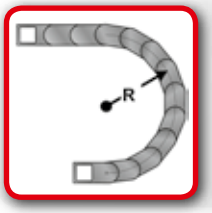
Loading side

outside flexure curve



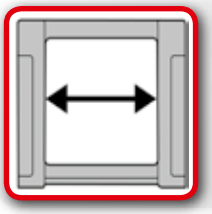
Available interior heights

25.0 mm



Available radii

60.0 – 250.0 mm



Available interior widths

26.0 – 125.0 mm

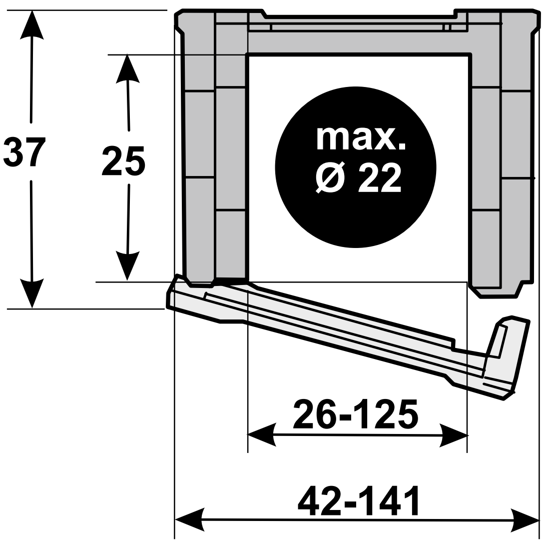
Ordering key

Type	Variation	Inside width mm	Outside width mm	Radius mm	Ridge version	Material	Chain length mm
0250	03	26 37 62 87 101 125	42 53 78 103 117 141	60 75 100 125 150 200 250	0	0 7 9	

Ordering key _ _ _ _ | _ _ | _ _ _ | _ _ _ | _ | _ | _ _ _ _ _ _

Chain link

Loading side: outside flexure curve



Dimensions in mm

0 Standard (PA/black)
7 ESD (PA/light grey)
9 Special version

0 PA full-ridged with bias

03 Cover on outside of radius
Cover on inside of radius
Opens on outside of radius

Order sample: 0250 03 026 060 0 0 1230
Cover in outside bend, cover in inside bend, can be opened from outside bend
Inside width 26 mm; radius 60 mm
Plastic bridge, full-ridged with bias, material black-coloured polyamide
Chain length 1230 mm (41 links)

Technical specifications

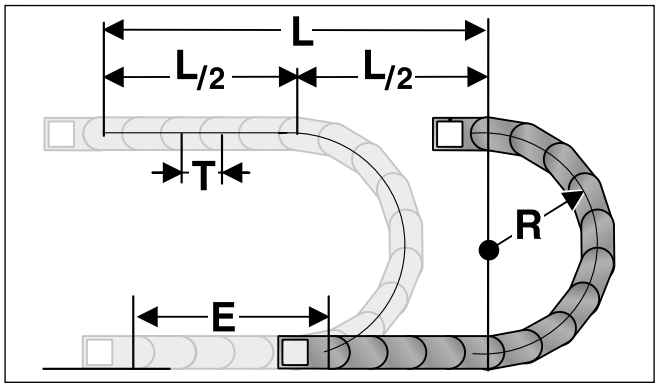
Travel distance gliding L_g max.:	40.0 m
Travel distance self-supporting L_f max.:	see diagram
Travel distance vertical, hanging L_{vh} max.:	25.0 m
Travel distance vertical, upright L_{vs} max.:	3.0 m
Rotated 90°, unsupported L_{90f} max.:	1.0 m
Speed, gliding V_g max.:	3.0 m/s
Speed, self-supporting V_f max.:	6.0 m/s
Acceleration, gliding a_g max.:	10.0 m/s²
Acceleration, self-supporting a_f max.:	15.0 m/s²

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

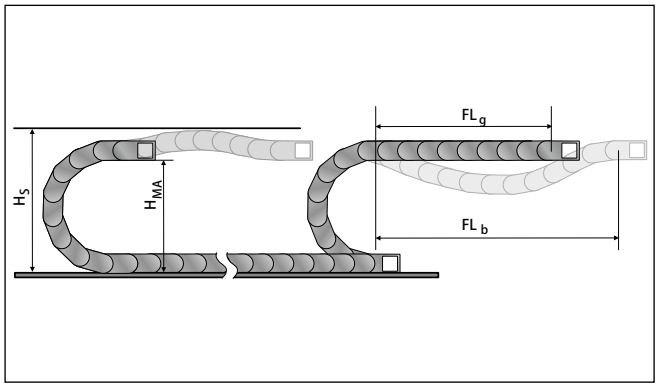


The fixed point of the cable drag chain should be connected in the middle of the travel distance.
This arrangement gives the shortest connection between the fixed point and the moving consumer and thus the most efficient chain length.

Chain length calculation = L/2 + π * R + 2 * T + E
≈ 1 m chain = x 30.0 mm links.

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

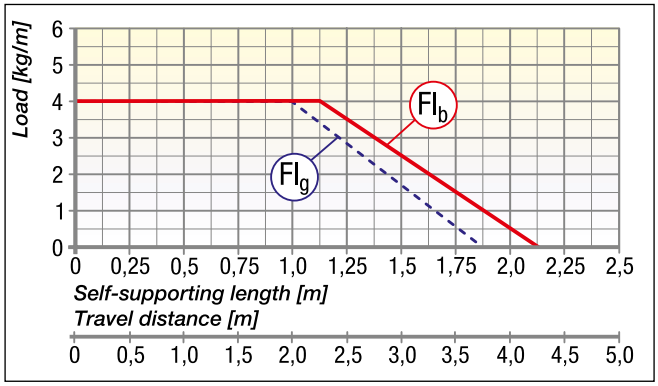
Self-supporting length



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

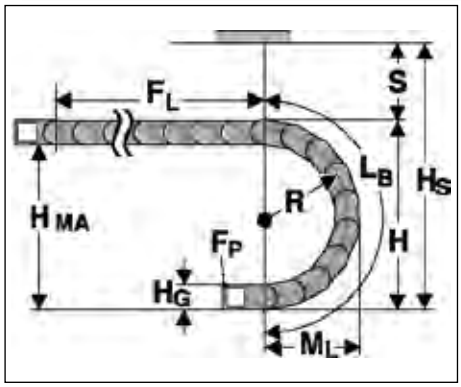
Load diagram for self-supporting applications



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

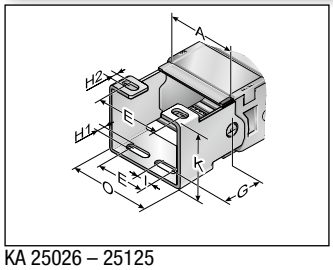
FL_b Self-supporting Length, upper run bent
In the FL_b range, the chain upper run has a sag of more than , but this is still less than the maximum sag.
Where the sag is greater than that permitted in the FL_b range, the application is critical and should be avoided. The self-supporting length can be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

Installation dimensions



Radius R	60	75	100	125	150	200	250
Outside height of chain link (H_G)	37	37	37	37	37	37	37
Height of bend (H)	157	187	237	287	337	437	537
Height of moving end connection (H_{MA})	120	150	200	250	300	400	500
Safety margin (S)	33	33	33	33	33	33	33
Installation height (H_S)	190	220	270	320	370	470	570
Arc projection (M_L)	109	124	149	174	199	249	299
Bend length (L_B)	276	324	402	481	559	716	873

Chain bracket U-part

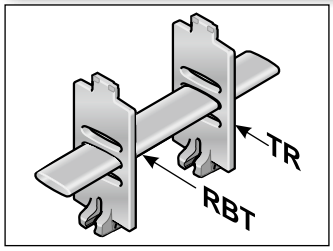


KA 25026 – 25125

The chain bracket can be supplied either in galvanised sheet steel or stainless steel. To secure one cable drag chain, you will need a bracket with a drilled hole and a bracket with a bolt.

Type	Order no.	Material	Inside width A mm	E mm	G mm	H1 mm	H2 mm	I mm	K mm	Outside width KA O mm
KA 25026 C male	025000001000	Sheet steel	26.0	A-10.0	42.0	6.6	6.6	6.6	36.0	A+11.0
KA 25026 C female	025000001100	Sheet steel	26.0	A-10.0	42.0	6.6	6.6	6.6	36.0	A+8.0
KA 25037 C male	025000001200	Sheet steel	37.0	A-10.0	42.0	6.6	6.6	6.6	36.0	A+11.0
KA 25037 C female	025000001300	Sheet steel	37.0	A-10.0	42.0	6.6	6.6	6.6	36.0	A+8.0
KA 25062 C male	025000001400	Sheet steel	62.0	A-10.0	42.0	6.6	6.6	6.6	36.0	A+11.0
KA 25062 C female	025000001500	Sheet steel	62.0	A-10.0	42.0	6.6	6.6	6.6	36.0	A+8.0
KA 25087 C male	025000001600	Sheet steel	87.0	A-10.0	42.0	6.6	6.6	6.6	36.0	A+11.0
KA 25087 C female	025000001700	Sheet steel	87.0	A-10.0	42.0	6.6	6.6	6.6	36.0	A+8.0
KA 25101 C male	025000001800	Sheet steel	101.0	A-10.0	42.0	6.6	6.6	6.6	36.0	A+11.0
KA 25101 C female	025000001900	Sheet steel	101.0	A-10.0	42.0	6.6	6.6	6.6	36.0	A+8.0
KA 25125 C male	025000002000	Sheet steel	125.0	A-10.0	42.0	6.6	6.6	6.6	36.0	A+11.0
KA 25125 C female	025000002100	Sheet steel	125.0	A-10.0	42.0	6.6	6.6	6.6	36.0	A+8.0
KA 25026 C male	025000003000	Stainless steel 1.4301	26.0	A-10.0	42.0	6.6	6.6	6.6	36.0	A+11.0
KA 25026 C female	025000003100	Stainless steel 1.4301	26.0	A-10.0	42.0	6.6	6.6	6.6	36.0	A+8.0
KA 25037 C male	025000003200	Stainless steel 1.4301	37.0	A-10.0	42.0	6.6	6.6	6.6	36.0	A+11.0
KA 25037 C female	025000003300	Stainless steel 1.4301	37.0	A-10.0	42.0	6.6	6.6	6.6	36.0	A+8.0
KA 25062 C male	025000003400	Stainless steel 1.4301	62.0	A-10.0	42.0	6.6	6.6	6.6	36.0	A+11.0
KA 25062 C female	025000003500	Stainless steel 1.4301	62.0	A-10.0	42.0	6.6	6.6	6.6	36.0	A+8.0
KA 25087 C male	025000003600	Stainless steel 1.4301	87.0	A-10.0	42.0	6.6	6.6	6.6	36.0	A+11.0
KA 25087 C female	025000003700	Stainless steel 1.4301	87.0	A-10.0	42.0	6.6	6.6	6.6	36.0	A+8.0
KA 25101 C male	025000003800	Stainless steel 1.4301	101.0	A-10.0	42.0	6.6	6.6	6.6	36.0	A+11.0
KA 25101 C female	025000003900	Stainless steel 1.4301	101.0	A-10.0	42.0	6.6	6.6	6.6	36.0	A+8.0
KA 25125 C male	025000004000	Stainless steel 1.4301	125.0	A-10.0	42.0	6.6	6.6	6.6	36.0	A+11.0
KA 25125 C female	025000004100	Stainless steel 1.4301	125.0	A-10.0	42.0	6.6	6.6	6.6	36.0	A+8.0

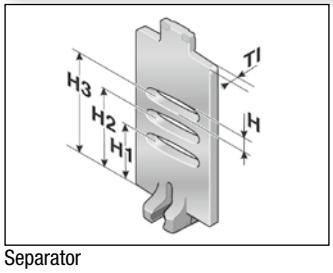
Shelving system



The shelf must be used with a minimum of two separators to create a shelving system. The additional levels prevent cables from criss-crossing and therefore destroying each other, while also avoiding excessive friction. The shelves are matched to the available chain widths.

Type	Order no.	Designation	Width mm	Pitch mm
RBT 037	100000003700	Shelf	37.0	2.5
RBT 062	100000006200	Shelf	62.0	2.5
RBT 086	100000008600	Shelf	86.0	2.5
RBT 101	100000010100	Shelf	101.0	2.5
RBT 125	100000012500	Shelf	125.0	2.5

Separator

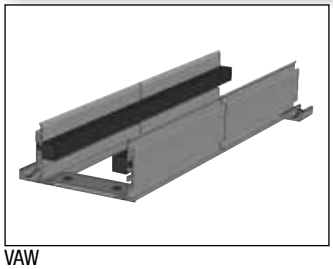


Separator

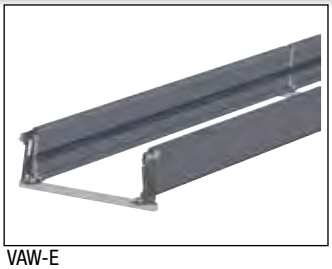
We recommend that separators be used if multiple round cables or conduits with differing diameters are to be installed. An offset configuration of the separators is advisable.

Type	Order no.	Designation	Pitch mm	TI mm	H mm	H1 mm	H2 mm	H3 mm
TR 25G	025000009200	Separator	2.5	2.0	2.5	8.3	12.8	17.3

Guide channels (VAW)



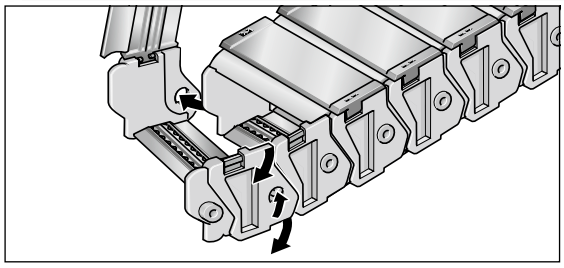
VAW



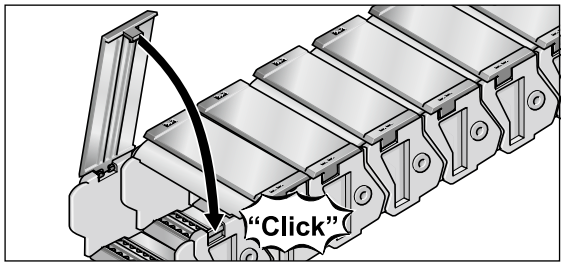
VAW-E

For this cable drag chain, a range of variable guide channel systems are available, constructed from aluminium or stainless steel 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

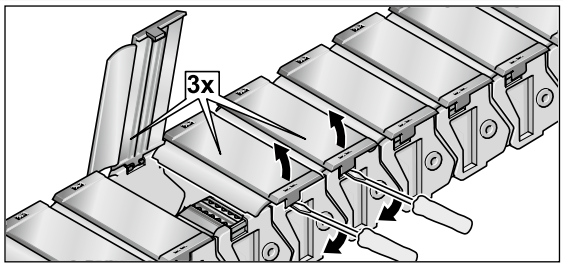


Step 1

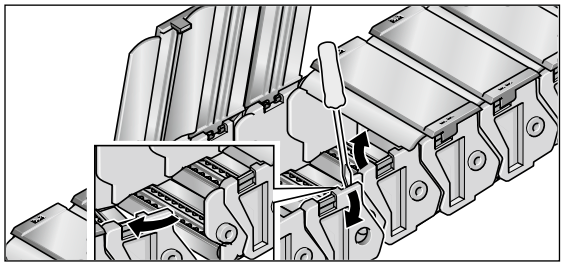


Step 2

Disassembly



Step 1

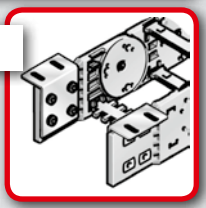


Step 2

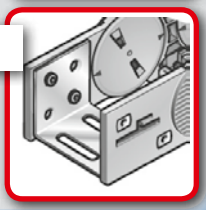
System overview

1 Chain bracket

Chain bracket angle



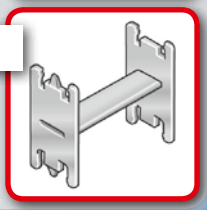
Chain bracket U-part

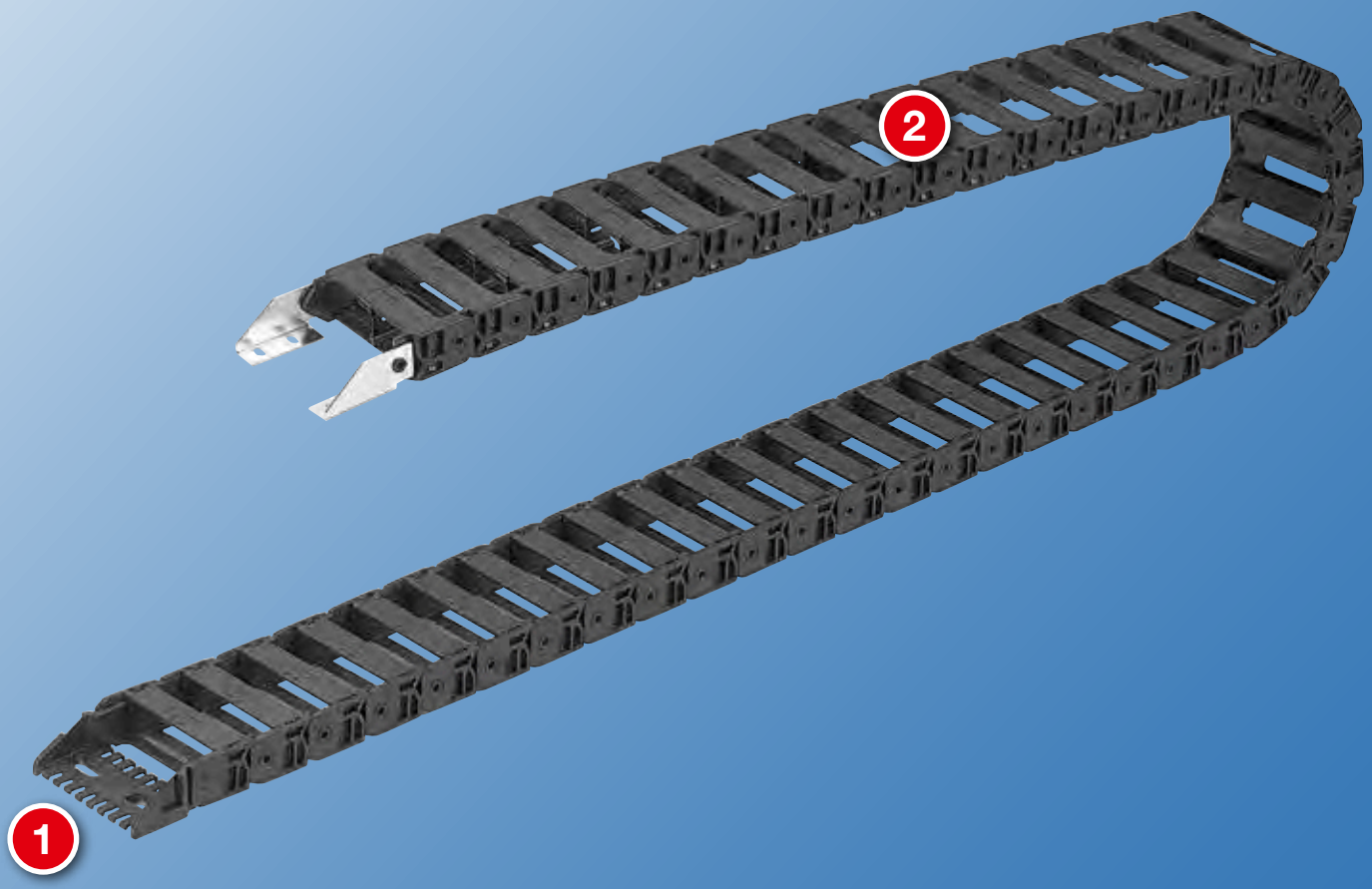


2 Shelving system

Separator TR

H-shaped shelf unit RE





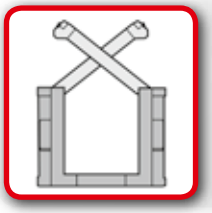
Guide channels

Aluminium VAW

Plastic VWAK

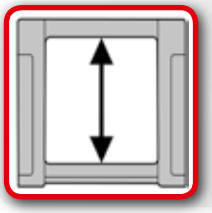
Stainless steel VAW-E

Technical data



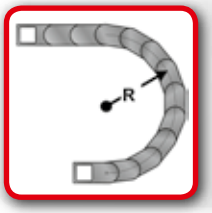
Loading side

Inside bend



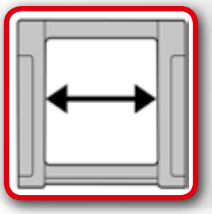
Available interior heights

26.0 mm



Available radii

50.0 – 300.0 mm



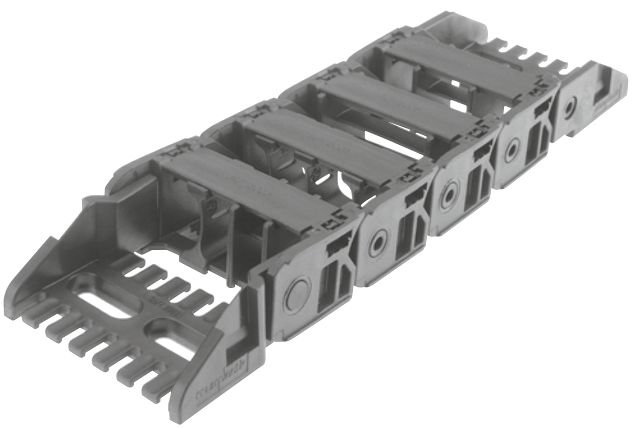
Available interior widths

26.0 – 125.0 mm

Ordering key

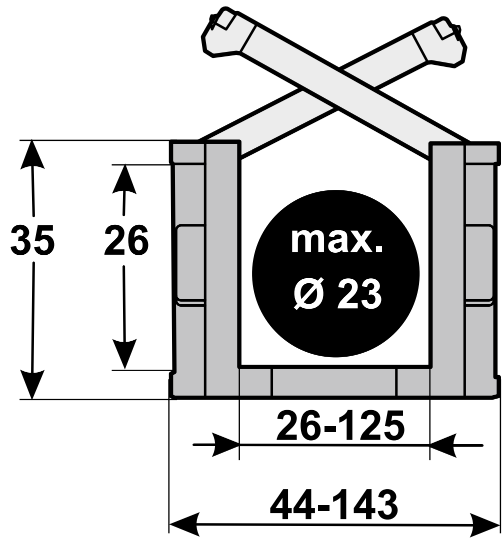
Type	Variation	Inside width mm	Outside width mm	Radius mm	Ridge version	Material	Chain length mm
		26	44				
		37	55	50			
		56	74	70			
		62	80	95		0	
		76	94	120		1	
		87	105	150		5	
		101	119	200	0	7	
0300	02	125	143	300	1	9	

Ordering key ____ __ ___ ___ _ _ ______



Chain link

Loading side: Inside bend



Dimensions in mm

0	Standard (PA/black)
1	UL94/V0 (PA/oxide red)
5	Polypropylene (PP/blue)
7	ESD (PA/light grey)
9	Special version

0	PA full-ridged with bias
1	PA full-ridged without bias

02	Frame bridge on outside of radius Frame bridge on inside of radius Opens on inside of radius

Order sample: 0300 02 026 050 0 0 1215
Frame bridge in outside bend, frame bridge in inside bend, can be opened from inside bend
Inside width 26 mm; radius 50 mm
Plastic bridge, full-ridged with bias, material black-coloured polyamide
Chain length 1215 mm (27 links)

Technical specifications

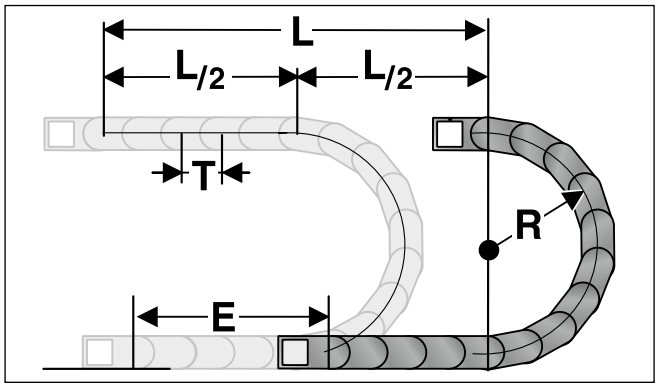
Travel distance gliding L_g max.:	60.0 m
Travel distance self-supporting L_f max.:	see diagram
Travel distance vertical, hanging L_{vh} max.:	40.0 m
Travel distance vertical, upright L_{vs} max.:	3.0 m
Rotated 90°, unsupported L_{90f} max.:	0.7 m
Speed, gliding V_g max.:	3.0 m/s
Speed, self-supporting V_f max.:	6.0 m/s
Acceleration, gliding a_g max.:	10.0 m/s²
Acceleration, self-supporting a_f max.:	15.0 m/s²

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:	UL 94 HB

Other material properties on request.

Determining the chain length

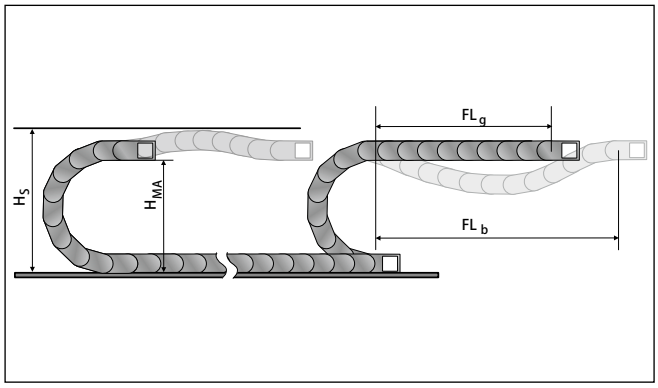


The fixed point of the cable drag chain should be connected in the middle of the travel distance.
This arrangement gives the shortest connection between the fixed point and the moving consumer and thus the most efficient chain length.

Chain length calculation = L/2 + π * R + 2 * T + E
≈ 1 m chain = x 45.0 mm links.

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

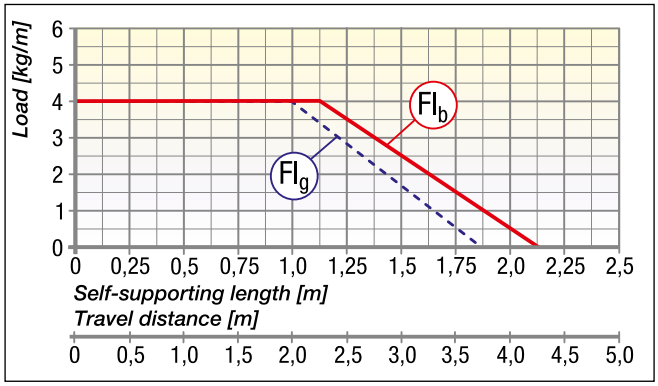
Self-supporting length



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

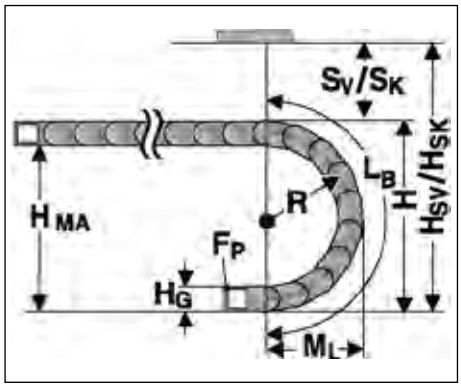
Load diagram for self-supporting applications



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

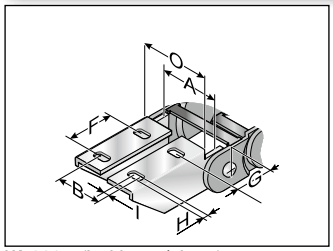
FL_b Self-supporting Length, upper run bent
In the FL_b range, the chain upper run has a sag of more than , but this is still less than the maximum sag.
Where the sag is greater than that permitted in the FL_b range, the application is critical and should be avoided. The self-supporting length can be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

Installation dimensions

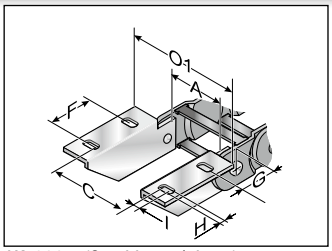


Radius R	50	70	95	120	150	200	300
Outside height of chain link (H_G)	35	35	35	35	35	35	35
Height of bend (H)	135	175	225	275	335	435	635
Height of moving end connection (H_{MA})	100	140	190	240	300	400	600
Safety margin with bias (S_V)	45	45	45	45	45	45	45
Installation height with bias (H_{SV})	180	220	270	320	380	480	680
Safety margin without bias (S_K)	10	10	10	10	10	10	10
Installation height without bias (H_{SK})	145	185	235	285	345	445	645
Arc projection (M_L)	113	133	158	183	213	263	363
Bend length (L_B)	257	320	398	477	571	728	1042

Chain bracket angle



KA 300... (Inside up / down)

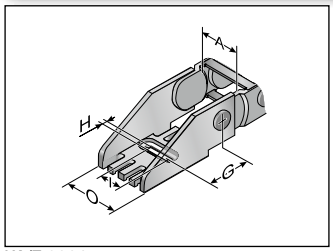


KA 300... (Outside up / down)

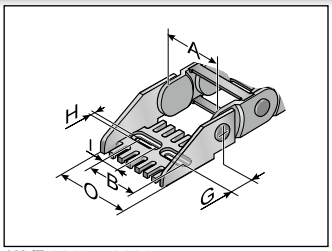
The chain bracket can be supplied either in galvanised sheet steel or stainless steel. To secure one cable drag chain, you will need two angle brackets (left and right) with a drilled hole and two angle brackets (left and right) with a bolt. The order numbers given below each comprise a left and right angle bracket.

Type	Order no.	Material	Inside width A mm	B mm	C mm	F mm	G mm	HØ mm	I mm	Outside width KA O mm	Outside width KA O1 mm
KA 3008 male	0300000052	Sheet steel	26.0 – 125.0	A-8.5	A+22.5	25.0	21.0	6.5	45.0	A+18.0	A+40.0
KA 3008 female	0300000053	Sheet steel	26.0 – 125.0	A-3.5	A+31.0	25.0	21.0	6.5	45.0	A+9.0	A+40.0
KA 3009 male	0300000054	Stainless steel 1.4301	26.0 – 125.0	A-8.5	A+22.5	25.0	21.0	6.5	45.0	A+18.0	A+40.0
KA 3009 female	0300000055	Stainless steel 1.4301	26.0 – 125.0	A-3.5	A+31.0	25.0	21.0	6.5	45.0	A+9.0	A+40.0

Chain bracket U-part



KA/Z 3001



KA/Z 3002 – 3006

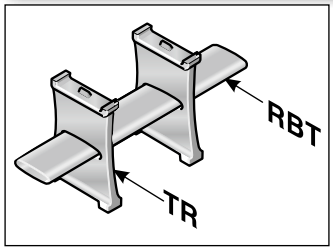
The type KA/Z 3001 – 3006 chain bracket is a plastic part with an extrusion-coated metal insert. The bracket is precisely adjusted to the respective chain width and only needs to be snapped in at the chain link. Please order one male and one female end bracket for each chain. The brackets should be fastened with M6 screws. The cables or tubes may be fastened with cable ties at the integrated strain relief of the chain bracket.

Type	Order no.	Material	Inside width A mm	B mm	G mm	HØ mm	I mm	Outside width KA O mm
KA/Z 3001 male	030000008000	Plastic with metal insert	26.0		31.5	6.5	18.5	A+18.0
KA/Z 3001 female	030000008100	Plastic with metal insert	26.0		31.5	6.5	18.5	A+18.0
KA/Z 3002 male	030000008200	Plastic with metal insert	37.0	A-7.0	31.5	6.5	7.5	A+18.0
KA/Z 3002 female	030000008300	Plastic with metal insert	37.0	A-7.0	31.5	6.5	7.5	A+18.0
KA/Z 3002.5 male	030000007600	Plastic with metal insert	56.0	A-8.0	31.5	6.5	7.5	A+18.0
KA/Z 3002.5 female	030000007700	Plastic with metal insert	56.0	A-8.0	31.5	6.5	7.5	A+18.0
KA/Z 3003 male	030000008400	Plastic with metal insert	62.0	A-7.0	31.5	6.5	18.5	A+18.0

Chain bracket U-part (Continued...)

Type	Order no.	Material	Inside width A mm	B mm	G mm	HØ mm	I mm	Outside width KA O mm
KA/Z 3003 female	030000008500	Plastic with metal insert	62.0	A-7.0	31.5	6.5	18.5	A+18.0
KA/Z 3003.5 male	030000007800	Plastic with metal insert	76.0	A-8.0	31.5	6.5	18.5	A+18.0
KA/Z 3003.5 female	030000007900	Plastic with metal insert	76.0	A-8.0	31.5	6.5	18.5	A+18.0
KA/Z 3004 male	030000008600	Plastic with metal insert	87.0	A-7.0	31.5	6.5	18.5	A+18.0
KA/Z 3004 female	030000008700	Plastic with metal insert	87.0	A-7.0	31.5	6.5	18.5	A+18.0
KA/Z 3005 male	030000008800	Plastic with metal insert	101.0	A-7.0	31.5	6.5	18.5	A+18.0
KA/Z 3005 female	030000008900	Plastic with metal insert	101.0	A-7.0	31.5	6.5	18.5	A+18.0
KA/Z 3006 male	030000009300	Plastic with metal insert	125.0	A-6.5	31.5	6.5	18.5	A+18.0
KA/Z 3006 female	030000009400	Plastic with metal insert	125.0	A-6.5	31.5	6.5	18.5	A+18.0

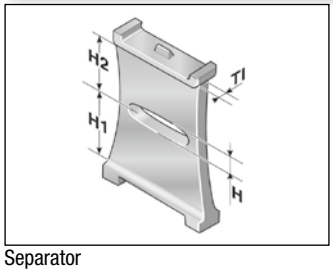
Shelving system



The shelf must be used with a minimum of two separators to create a shelving system. The additional levels prevent cables from criss-crossing and therefore destroying each other, while also avoiding excessive friction. The shelves are matched to the available chain widths.

Type	Order no.	Designation	Width mm	Pitch mm
RBT 037	100000003700	Shelf	37.0	3.0
RBT 062	100000006200	Shelf	62.0	3.0
RBT 086	100000008600	Shelf	86.0	3.0
RBT 101	100000010100	Shelf	101.0	3.0
RBT 125	100000012500	Shelf	125.0	3.0

Separator

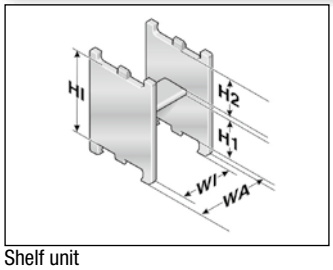


Separator

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. The lockable separator must be used for side-mounted cable drag chains to prevent the separator from slipping down.

Type	Order no.	Designation	Version	Pitch mm	TI mm	H mm	H1 mm	H2 mm
TR 3000	030000009000	Separator	moveable	3.0	1.5	2.5	12.9	12.9
TR 3001	030000009200	Separator	moveable / lockable	3.0	1.5	2.5	12.9	12.9
TR 3002	030000009500	Separator, closed	moveable / lockable	3.0	1.5	2.5	12.9	12.9

Shelf unit

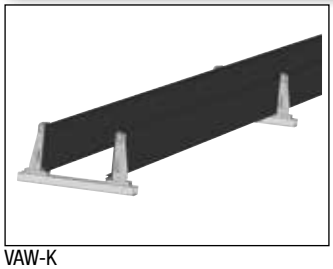


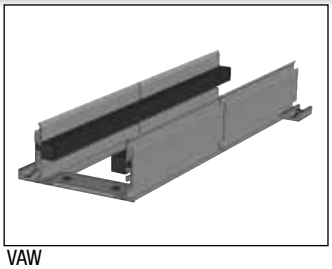
Shelf unit

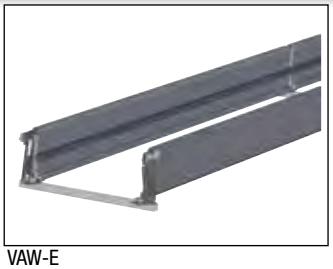
Insert to obtain additional levels in pre-defined window distances.

Type	Order no.	Designation	Pitch mm	WA mm	WI mm	H1 mm	H2 mm	HI mm
RE 26/15	100000261510	H-shaped shelf unit	3.0	17.5	12.5	13.7	9.6	26.0
RE 26/27	100000262710	H-shaped shelf unit	3.0	29.5	24.5	13.7	9.6	26.0
RE 26/32	100000263210	H-shaped shelf unit	3.0	34.5	29.5	13.7	9.6	26.0
RE 26/51	100000265110	H-shaped shelf unit	3.0	53.5	48.5	13.7	9.6	26.0

Guide channels (VAW)

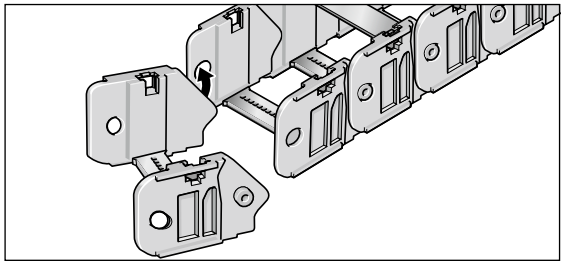

VAW-K

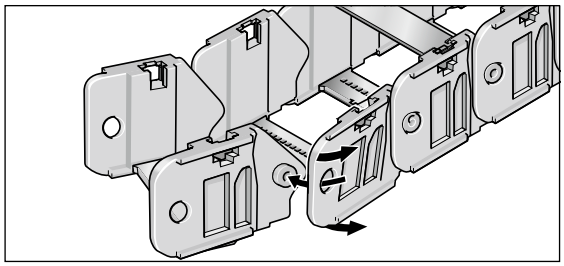

VAW

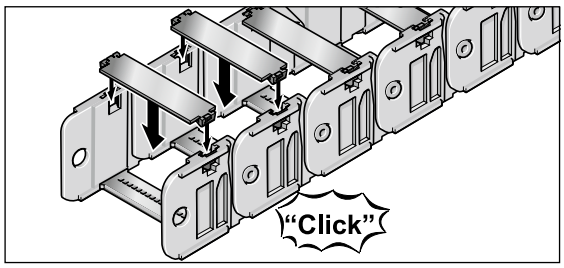

VAW-E

For this cable drag chain, a range of variable guide channel systems are available, constructed from aluminium, plastic or stainless steel 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

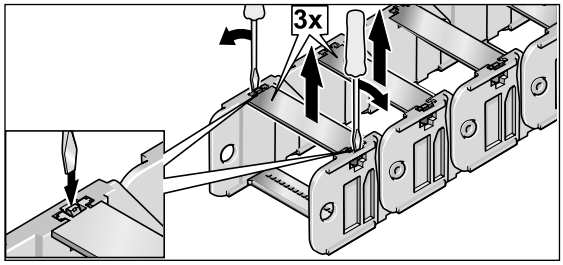

Step 1


Step 2

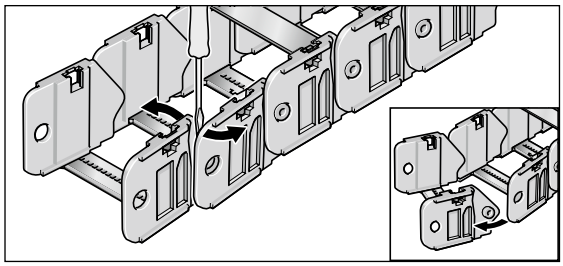


Step 3

Disassembly



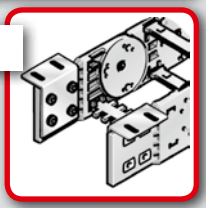
Step 1


Step 2

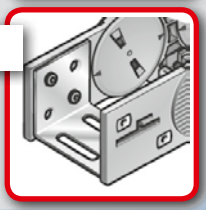
System overview

1 Chain bracket

Chain bracket angle



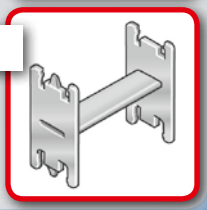
Chain bracket U-part

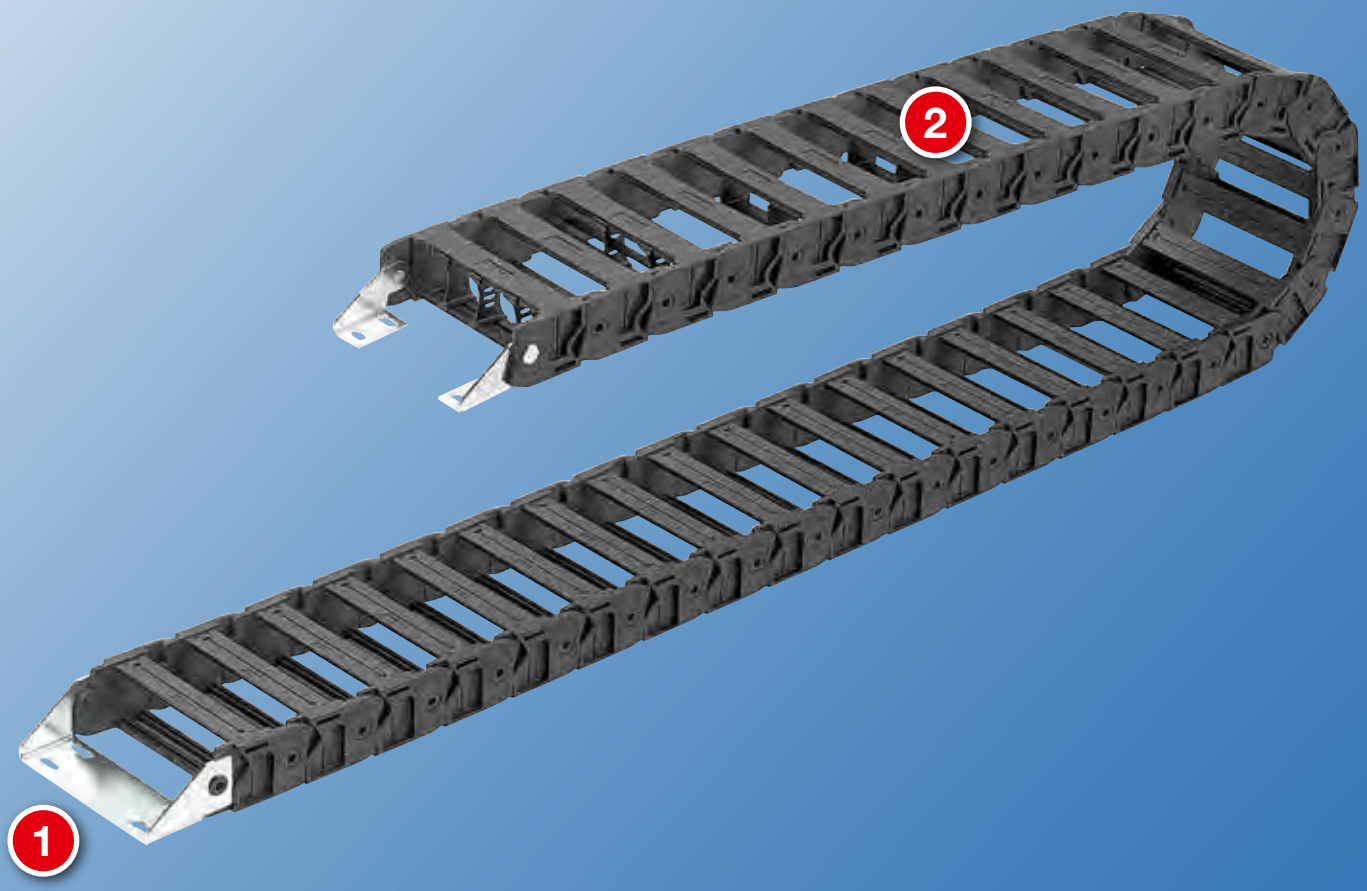


2 Shelving system

Separator TR

H-shaped shelf unit RE



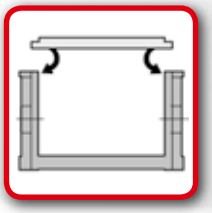


Guide channels

Aluminium VAW

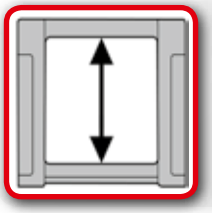
Stainless steel VAW-E

Technical data



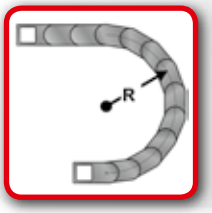
Loading side

Inside bend



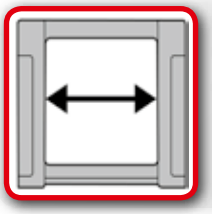
Available interior heights

34.0 mm



Available radii

70.0 – 300.0 mm



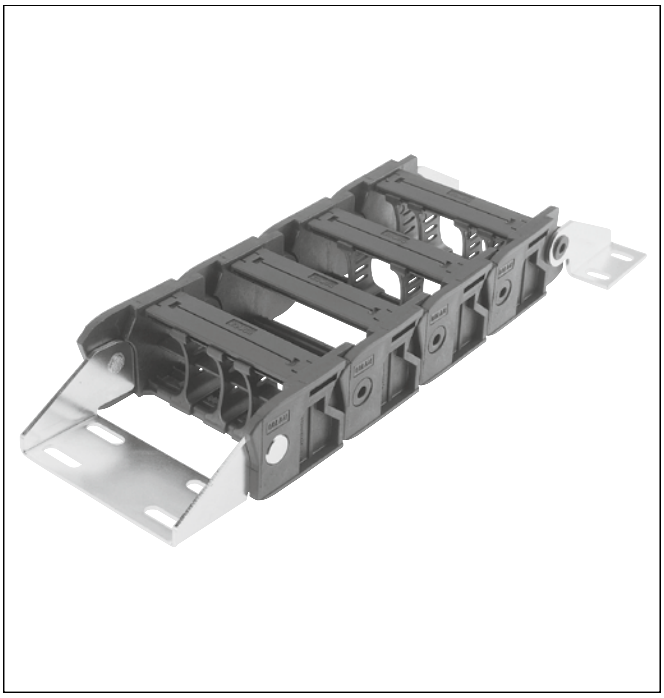
Available interior widths

62.0 – 150.0 mm

Ordering key

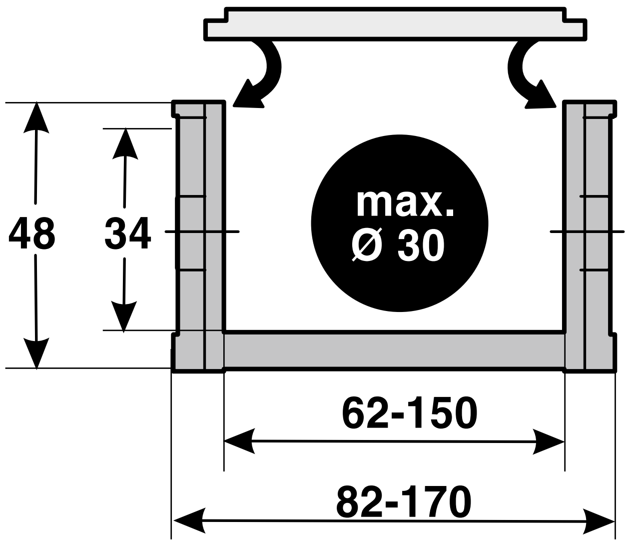
Type	Variation	Inside width mm	Outside width mm	Radius mm	Ridge version	Material	Chain length mm
0350	02	62 86 102 125 150	82 106 122 145 170	70 100 150 200 300	0 1	0 9	

Ordering key _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _



Chain link

Loading side: Inside bend



Dimensions in mm

0 Standard (PA/black)
9 Special version

0 PA full-ridged with bias
1 PA full-ridged without bias

02 Frame bridge on outside of radius
Frame bridge on inside of radius
Opens on inside of radius

Order sample: 0350 02 062 070 0 0 1276
Frame bridge in outside bend, frame bridge in inside bend, can be opened from inside bend
Inside width 62 mm; radius 70 mm
Plastic bridge, full-ridged with bias, material black-coloured polyamide
Chain length 1276 mm (22 links)

Technical specifications

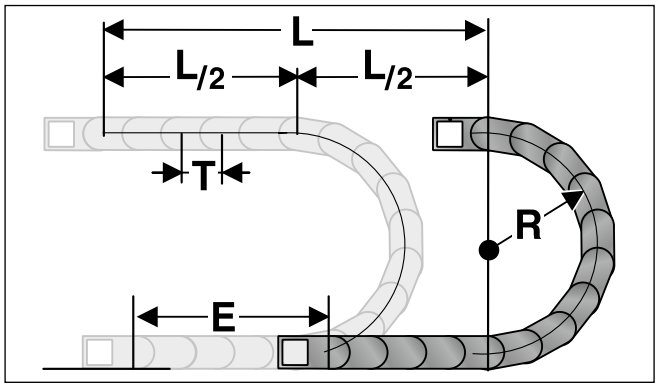
Travel distance gliding L_g max.:	80.0 m
Travel distance self-supporting L_f max.:	see diagram
Travel distance vertical, hanging L_{vh} max.:	40.0 m
Travel distance vertical, upright L_{vs} max.:	3.0 m
Rotated 90°, unsupported L_{90f} max.:	1.0 m
Speed, gliding V_g max.:	3.0 m/s
Speed, self-supporting V_f max.:	10.0 m/s
Acceleration, gliding a_g max.:	15.0 m/s²
Acceleration, self-supporting a_f max.:	20.0 m/s²

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

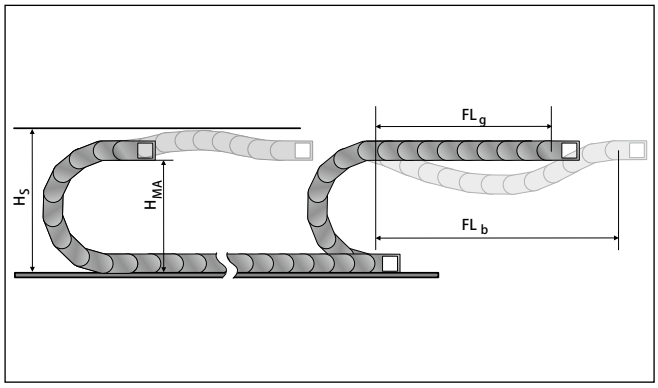


The fixed point of the cable drag chain should be connected in the middle of the travel distance.
This arrangement gives the shortest connection between the fixed point and the moving consumer and thus the most efficient chain length.

Chain length calculation = L/2 + π * R + 2 * T + E
≈ 1 m chain = x 58.0 mm links.

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

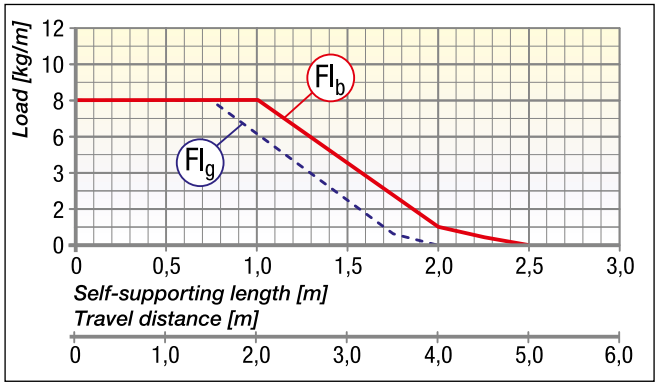
Self-supporting length



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

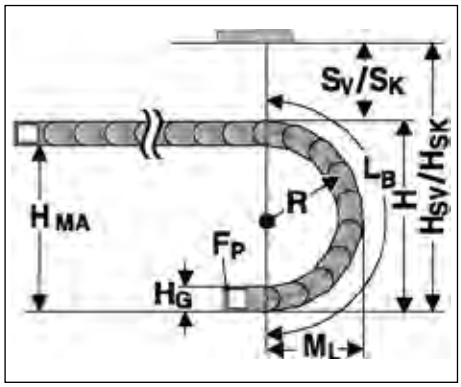
Load diagram for self-supporting applications



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

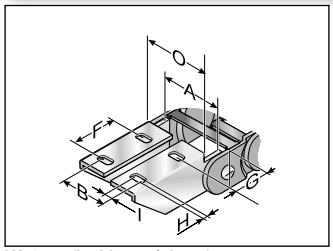
FL_b Self-supporting Length, upper run bent
In the FL_b range, the chain upper run has a sag of more than , but this is still less than the maximum sag.
Where the sag is greater than that permitted in the FL_b range, the application is critical and should be avoided. The self-supporting length can be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

Installation dimensions

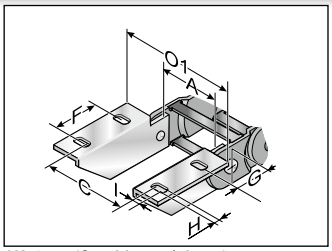


Radius R	70	100	150	200	300
Outside height of chain link (H_G)	48	48	48	48	48
Height of bend (H)	188	248	348	448	648
Height of moving end connection (H_{MA})	140	200	300	400	600
Safety margin with bias (S_V)	40	40	40	40	40
Installation height with bias (H_{SV})	228	288	388	488	688
Safety margin without bias (S_K)	15	15	15	15	15
Installation height without bias (H_{SK})	203	263	363	463	663
Arc projection (M_L)	152	182	232	282	382
Bend length (L_B)	353	447	604	761	1075

Chain bracket angle



KA 35... (Inside up / down)

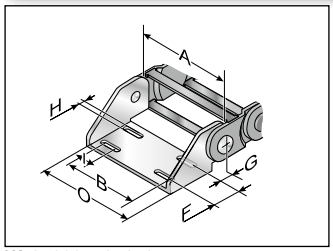


KA 35... (Outside up / down)

The chain bracket can be supplied either in galvanised sheet steel or stainless steel. To secure one cable drag chain, you will need two angle brackets (left and right) with a drilled hole and two angle brackets (left and right) with a bolt. The order numbers given below each comprise a left and right angle bracket.

Type	Order no.	Material	Inside width A mm	B mm	C mm	F mm	G mm	HØ mm	I mm	Outside width KA O mm	Outside width KA O1 mm
KA 3508 male	0350000054	Sheet steel	62.0 – 150.0	A-7.0	A+28.0	25.0	20.0	7.0	8.0	A+20.0	A+52.0
KA 3508 female	0350000055	Sheet steel	62.0 – 150.0	A-12.0	A+38.5	25.0	20.0	7.0	8.0	A+10.0	A+52.0
KA 3509 male	0350000056	Stainless steel 1.4301	62.0 – 150.0	A-7.0	A+28.0	25.0	20.0	7.0	8.0	A+20.0	A+52.0
KA 3509 female	0350000057	Stainless steel 1.4301	62.0 – 150.0	A-12.0	A+38.5	25.0	20.0	7.0	8.0	A+10.0	A+52.0

Chain bracket U-part



KA 35062 – 35150

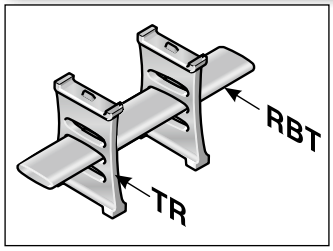
The metal connection (U-section) is precisely adjusted to the respective chain width. It only needs to be snapped in the chain link. Please order one male and one female end bracket for each chain. The brackets should be fastened with M6 screws.

Type	Order no.	Material	Inside width A mm	B mm	F mm	G mm	HØ mm	I mm	Outside width KA O mm
KA 35062 male	035000007000	Sheet steel	62.0	A-7.0	25.0	20.0	7.0	15.0	A+20.0
KA 35062 female	035000007100	Sheet steel	62.0	A-12.0	25.0	20.0	7.0	15.0	A+20.0
KA 35086 male	035000007200	Sheet steel	86.0	A-7.0	25.0	20.0	7.0	15.0	A+20.0
KA 35086 female	035000007300	Sheet steel	86.0	A-12.0	25.0	20.0	7.0	15.0	A+20.0
KA 35102 male	035000007400	Sheet steel	102.0	A-7.0	25.0	20.0	7.0	15.0	A+20.0
KA 35102 female	035000007500	Sheet steel	102.0	A-12.0	25.0	20.0	7.0	15.0	A+20.0

Chain bracket U-part (Continued...)

Type	Order no.	Material	Inside width A mm	B mm	F mm	G mm	HØ mm	I mm	Outside width KA O mm
KA 35125 male	035000007600	Sheet steel	125.0	A-7.0	25.0	20.0	7.0	15.0	A+20.0
KA 35125 female	035000007700	Sheet steel	125.0	A-12.0	25.0	20.0	7.0	15.0	A+20.0
KA 35150 male	035000007800	Sheet steel	150.0	A-7.0	25.0	20.0	7.0	15.0	A+20.0
KA 35150 female	035000007900	Sheet steel	150.0	A-12.0	25.0	20.0	7.0	15.0	A+20.0
KA 35062 male	035000008000	Stainless steel 1.4301	62.0	A-7.0	25.0	20.0	7.0	15.0	A+20.0
KA 35062 female	035000008100	Stainless steel 1.4301	62.0	A-12.0	25.0	20.0	7.0	15.0	A+20.0
KA 35086 male	035000008200	Stainless steel 1.4301	86.0	A-7.0	25.0	20.0	7.0	15.0	A+20.0
KA 35086 female	035000008300	Stainless steel 1.4301	86.0	A-12.0	25.0	20.0	7.0	15.0	A+20.0
KA 35102 male	035000008400	Stainless steel 1.4301	102.0	A-7.0	25.0	20.0	7.0	15.0	A+20.0
KA 35102 female	035000008500	Stainless steel 1.4301	102.0	A-12.0	25.0	20.0	7.0	15.0	A+20.0
KA 35125 male	035000008600	Stainless steel 1.4301	125.0	A-7.0	25.0	20.0	7.0	15.0	A+20.0
KA 35125 female	035000008700	Stainless steel 1.4301	125.0	A-12.0	25.0	20.0	7.0	15.0	A+20.0
KA 35150 male	035000008800	Stainless steel 1.4301	150.0	A-7.0	25.0	20.0	7.0	15.0	A+20.0
KA 35150 female	035000008900	Stainless steel 1.4301	150.0	A-12.0	25.0	20.0	7.0	15.0	A+20.0

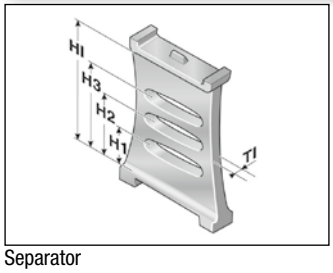
Shelving system



The shelf must be used with a minimum of two separators to create a shelving system. The additional levels prevent cables from criss-crossing and therefore destroying each other, while also avoiding excessive friction. The shelves are matched to the available chain widths.

Type	Order no.	Designation	Width mm	Pitch mm
RBT 062	100000006200	Shelf	62.0	3.0
RBT 086	100000008600	Shelf	86.0	3.0
RBT 101	100000010100	Shelf	101.0	3.0
RBT 125	100000012500	Shelf	125.0	3.0
RBT 150	100000015000	Shelf	150.0	3.0

Separator

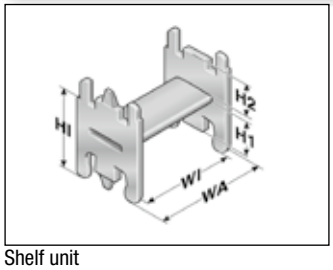


Separator

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	Version	Pitch mm	Tl mm	H mm	H1 mm	H2 mm	H3 mm	Hl mm
TR 35	035000009200	Separator	lockable	3.0	2.0	2.5	10.9	16.9	22.9	33.8

Shelf unit

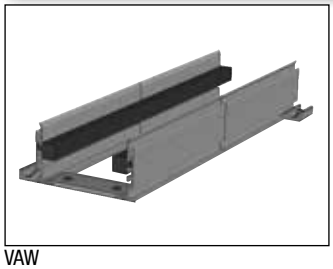


Shelf unit

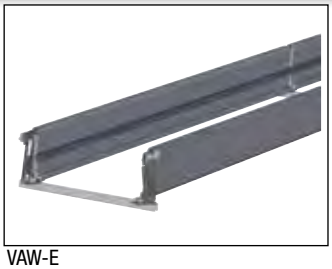
Insert to obtain additional levels in pre-defined window distances.

Type	Order no.	Designation	Pitch mm	WA mm	Wl mm	H1 mm	H2 mm	Hl mm
RE 35/33	100000353310	H-shaped shelf unit	3.0	35.5	30.5	18.0	12.0	33.0
RE 35/48	100000354810	H-shaped shelf unit	3.0	50.5	45.5	18.0	12.0	33.0
RE 35/57	100000355710	H-shaped shelf unit	3.0	59.5	54.5	18.0	12.0	33.0

Guide channels (VAW)



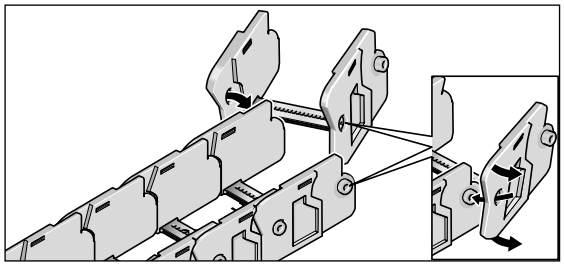
VAW



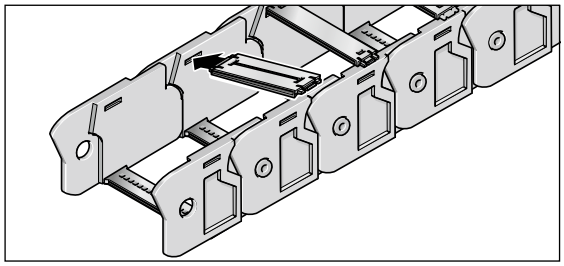
VAW-E

For this cable drag chain, a range of variable guide channel systems are available, constructed from aluminium or stainless steel 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“.

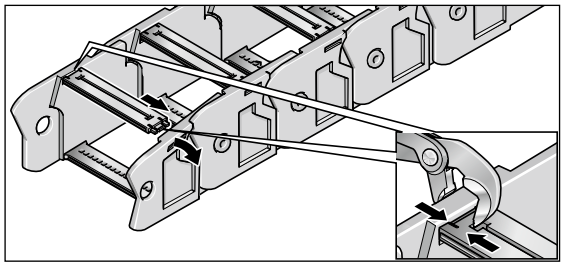
Assembly



Step 1

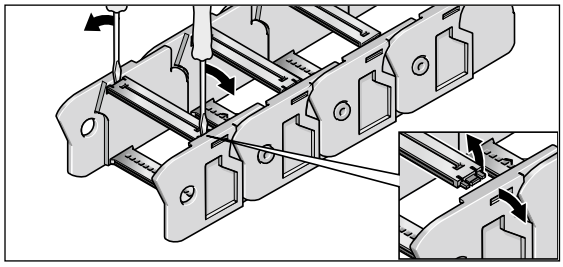


Step 2

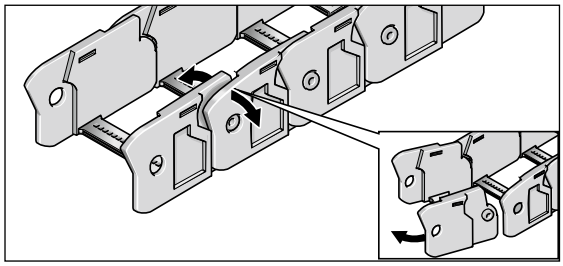


Step 3

Disassembly



Step 1

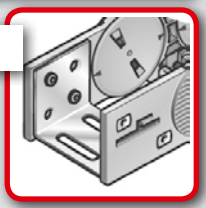


Step 2

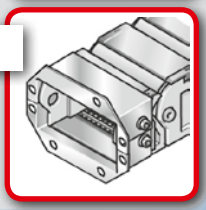
System overview

1 Chain bracket

Chain bracket U-part

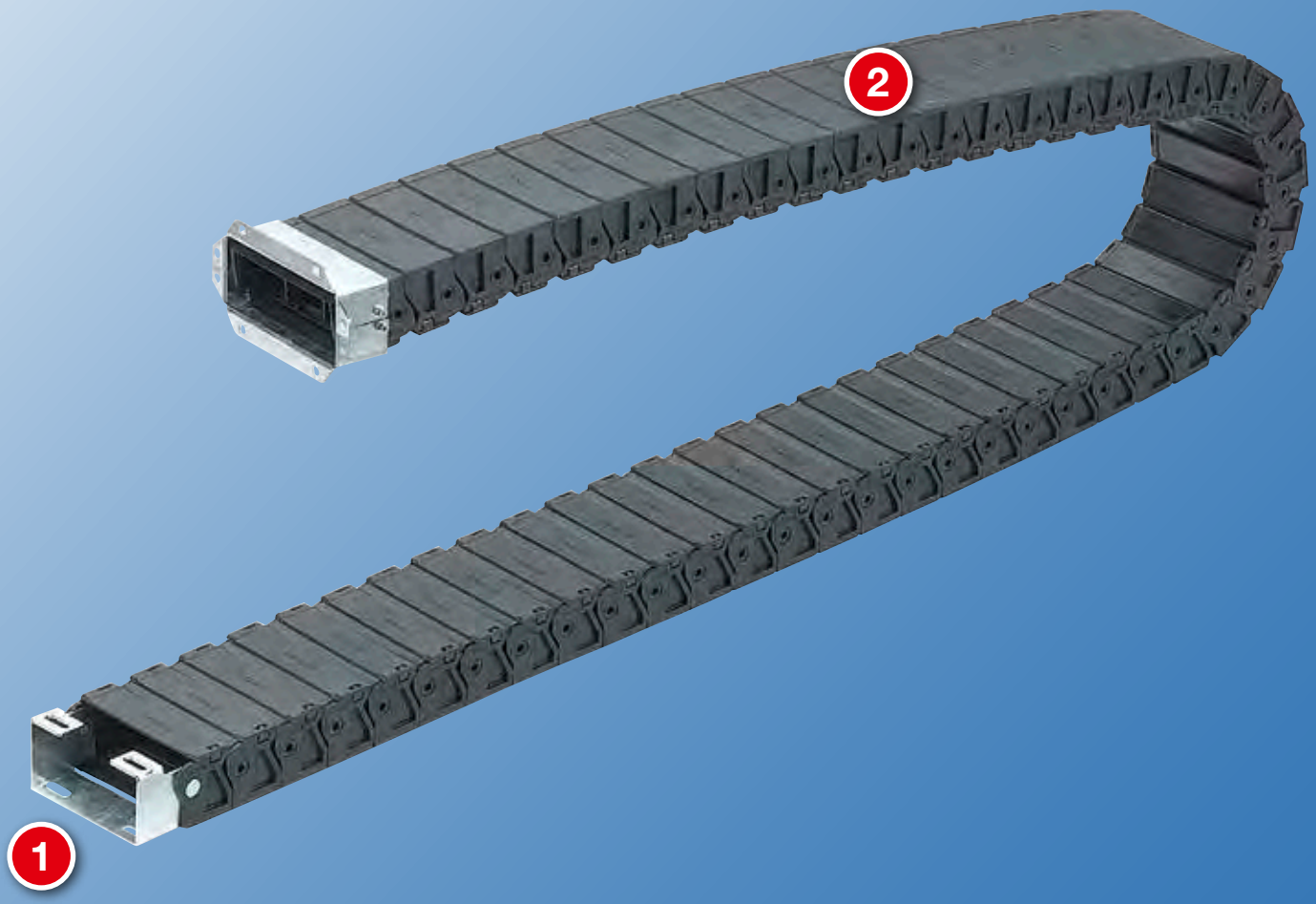


End brackets flange



2 Shelving system

Separator TR

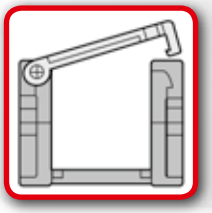


Guide channels

Aluminium VAW

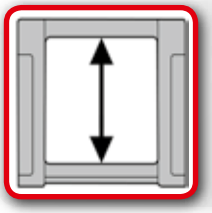
Stainless steel VAW-E

Technical data



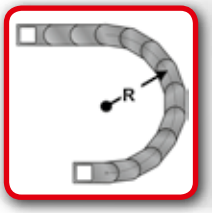
Loading side

Inside bend



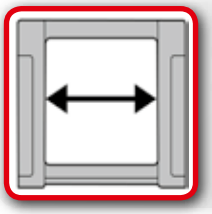
Available interior heights

36.0 mm



Available radii

80.0 – 200.0 mm



Available interior widths

62.0 – 125.0 mm

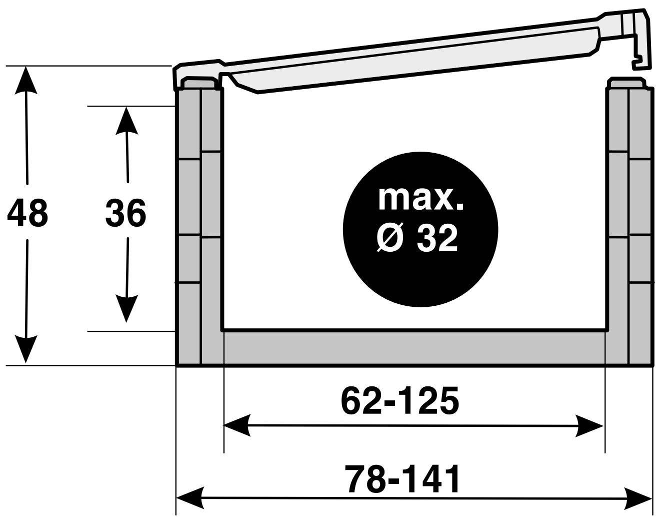
Ordering key

Type	Variation	Inside width mm	Outside width mm	Radius mm	Ridge version	Material	Chain length mm
0360	04	62 86 102 125	78 102 118 141	80 100 125 150 200	0	0 9	

Ordering key _ _ _ _   _ _   _ _ _   _ _ _   _   _   _ _ _ _ _ _

Chain link

Loading side: Inside bend



Dimensions in mm

0 Standard (PA/black)
9 Special version

0 PA full-ridged with bias

04 Cover on outside of radius
Cover on inside of radius
Opens on inside of radius

Order sample: 0360 04 062 080 0 0 1280
Cover in outside bend, cover in inside bend, openable from inside bend
Inside width 62 mm; radius 80 mm
Plastic bridge, full-ridged with bias, material black-coloured polyamide
Chain length 1280 mm (32 links)

Technical specifications

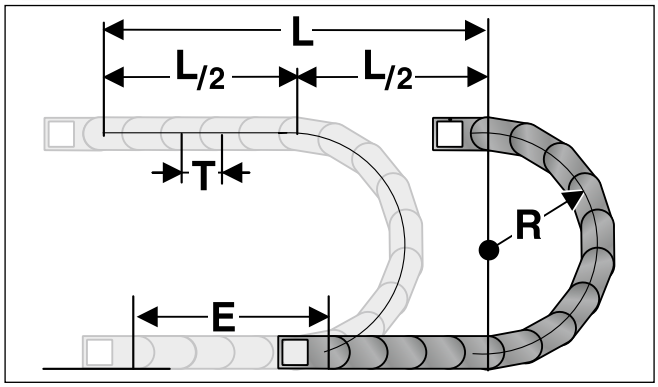
Travel distance gliding L_g max.:	60.0 m
Travel distance self-supporting L_f max.:	see diagram
Travel distance vertical, hanging L_{vh} max.:	30.0 m
Travel distance vertical, upright L_{vs} max.:	3.0 m
Rotated 90°, unsupported L_{90f} max.:	1.0 m
Speed, gliding V_g max.:	3.0 m/s
Speed, self-supporting V_f max.:	10.0 m/s
Acceleration, gliding a_g max.:	15.0 m/s²
Acceleration, self-supporting a_f max.:	20.0 m/s²

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

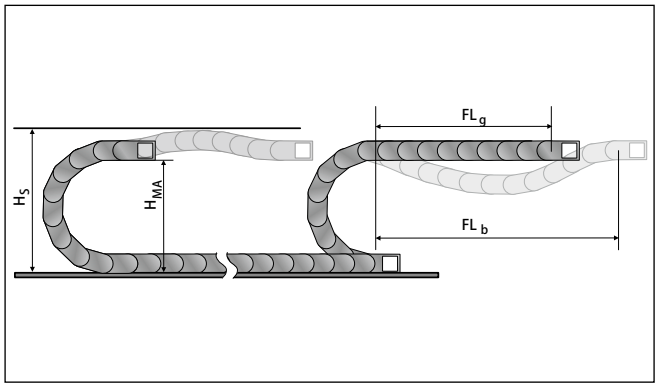


The fixed point of the cable drag chain should be connected in the middle of the travel distance.
This arrangement gives the shortest connection between the fixed point and the moving consumer and thus the most efficient chain length.

Chain length calculation = L/2 + π * R + 2 * T + E
≈ 1 m chain = x 40.0 mm links.

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

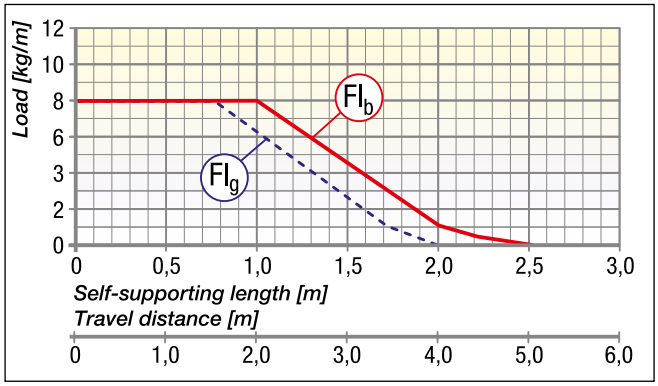
Self-supporting length



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

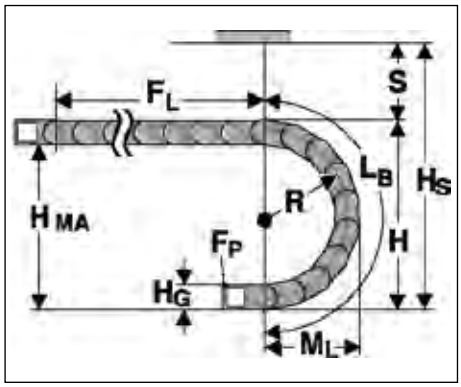
Load diagram for self-supporting applications



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

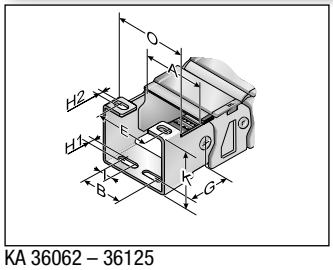
FL_b Self-supporting Length, upper run bent
In the FL_b range, the chain upper run has a sag of more than , but this is still less than the maximum sag.
Where the sag is greater than that permitted in the FL_b range, the application is critical and should be avoided. The self-supporting length can be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

Installation dimensions



Radius R	80	100	125	150	200
Outside height of chain link (H_G)	48	48	48	48	48
Height of bend (H)	208	248	298	348	448
Height of moving end connection (H_{MA})	160	200	250	300	400
Safety margin (S)	32	32	32	32	32
Installation height (H_S)	240	280	330	380	480
Arc projection (M_L)	144	164	189	214	264
Bend length (L_B)	367	429	508	586	743

Chain bracket U-part

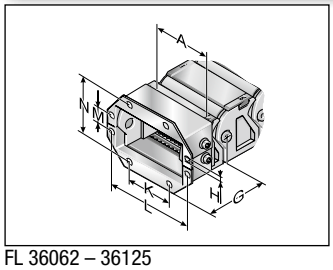


KA 36062 – 36125

The chain bracket can be supplied either in galvanised sheet steel or stainless steel. To secure one cable drag chain, you will need a bracket with a drilled hole and a bracket with a bolt.

Type	Order no.	Material	Inside width A mm	E mm	G mm	H1 mm	H2 mm	I mm	K mm	Outside width KA O mm
KA 36062 C male	036000001000	Sheet steel	62.0	A-7.5	42.0	6.6	6.6	6.0	48.8	A+12.0
KA 36062 C female	036000001100	Sheet steel	62.0	A-7.5	42.0	6.6	6.6	6.0	48.8	A+8.0
KA 36086 C male	036000001200	Sheet steel	86.0	A-7.5	42.0	6.6	6.6	15.5	48.8	A+12.0
KA 36086 C female	036000001300	Sheet steel	86.0	A-7.5	42.0	6.6	6.6	15.5	48.8	A+8.0
KA 36102 C male	036000001400	Sheet steel	102.0	A-7.5	42.0	6.6	6.6	15.5	48.8	A+12.0
KA 36102 C female	036000001500	Sheet steel	102.0	A-7.5	42.0	6.6	6.6	15.5	48.8	A+8.0
KA 36125 C male	036000001600	Sheet steel	125.0	A-7.5	42.0	6.6	6.6	15.5	48.8	A+12.0
KA 36125 C female	036000001700	Sheet steel	125.0	A-7.5	42.0	6.6	6.6	15.5	48.8	A+8.0
KA 36062 C male	036000002000	Stainless steel 1.4301	62.0	A-7.5	42.0	6.6	6.6	6.0	48.8	A+12.0
KA 36062 C female	036000002100	Stainless steel 1.4301	62.0	A-7.5	42.0	6.6	6.6	6.0	48.8	A+8.0
KA 36086 C male	036000002200	Stainless steel 1.4301	86.0	A-7.5	42.0	6.6	6.6	15.5	48.8	A+12.0
KA 36086 C female	036000002300	Stainless steel 1.4301	86.0	A-7.5	42.0	6.6	6.6	15.5	48.8	A+8.0
KA 36102 C male	036000002400	Stainless steel 1.4301	102.0	A-7.5	42.0	6.6	6.6	15.5	48.8	A+12.0
KA 36102 C female	036000002500	Stainless steel 1.4301	102.0	A-7.5	42.0	6.6	6.6	15.5	48.8	A+8.0
KA 36125 C male	036000002600	Stainless steel 1.4301	125.0	A-7.5	42.0	6.6	6.6	15.5	48.8	A+12.0
KA 36125 C female	036000002700	Stainless steel 1.4301	125.0	A-7.5	42.0	6.6	6.6	15.5	48.8	A+8.0

End brackets flange

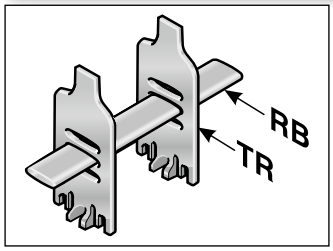


FL 36062 – 36125

A cable drag chain requires two chain brackets. The divisible flange connection has been specifically designed for commissioning and re-installation. This keeps the chain in the installed position.

Type	Order no.	Material	Inside width A mm	HØ mm	K mm	L mm	M mm	N mm
FL 36062	0360062054	Sheet steel	62.0	7.0	40.0	97.9	18.0	68.5
FL 36086	0360086054	Sheet steel	86.0	7.0	64.0	121.9	18.0	68.5
FL 36102	0360102054	Sheet steel	102.0	7.0	80.0	137.9	18.0	68.5
FL 36125	0360125054	Sheet steel	125.0	7.0	103.0	160.9	18.0	68.5
FL 36062	0360062056	Stainless steel 1.4301	62.0	7.0	40.0	97.9	18.0	68.5
FL 36086	0360086056	Stainless steel 1.4301	86.0	7.0	64.0	121.9	18.0	68.5
FL 36102	0360102056	Stainless steel 1.4301	102.0	7.0	80.0	137.9	18.0	68.5
FL 36125	0360125056	Stainless steel 1.4301	125.0	7.0	103.0	160.9	18.0	68.5

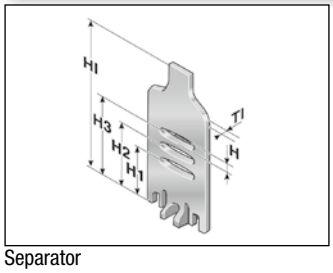
Shelving system



The shelf must be used with a minimum of two separators to create a shelving system. The additional levels prevent cables from criss-crossing and therefore destroying each other, while also avoiding excessive friction. The shelves are matched to the available chain widths.

Type	Order no.	Designation	Width mm	Pitch mm
RBT 062	100000006200	Shelf	62.0	2.5
RBT 086	100000008600	Shelf	86.0	2.5
RBT 101	100000010100	Shelf	101.0	2.5
RBT 125	100000012500	Shelf	125.0	2.5

Separator

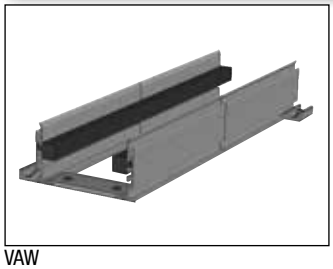


Separator

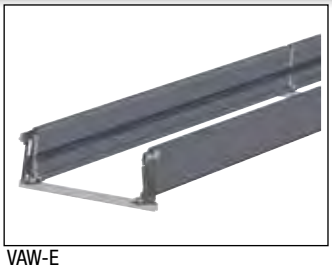
We recommend that separators be used if multiple round cables or conduits with differing diameters are to be installed. An offset configuration of the separators is advisable.

Type	Order no.	Designation	Pitch mm	TI mm	H mm	H1 mm	H2 mm	H3 mm	HI mm
TR 36G	036000009200	Separator	2.5	2.5	2.5	13.5	19.5	25.5	36.5

Guide channels (VAW)



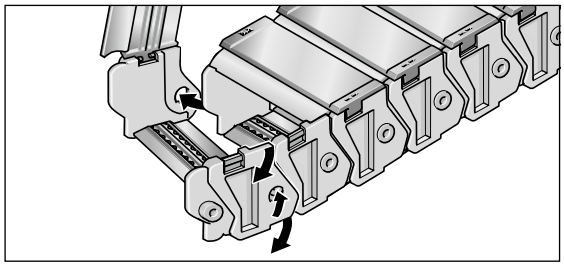
VAW



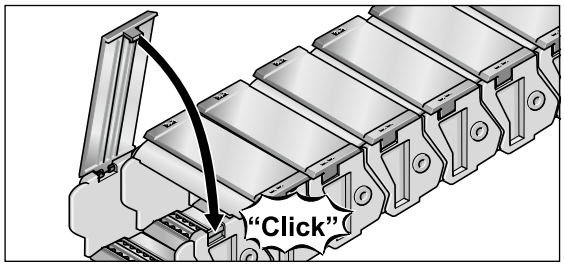
VAW-E

For this cable drag chain, a range of variable guide channel systems are available, constructed from aluminium or stainless steel 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

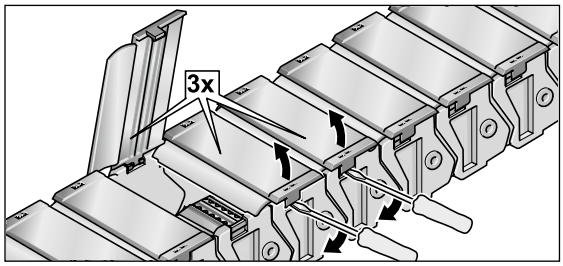


Step 1

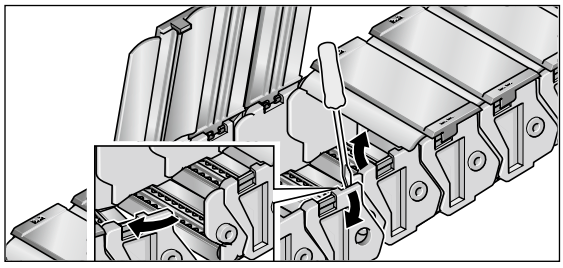


Step 2

Disassembly



Step 1

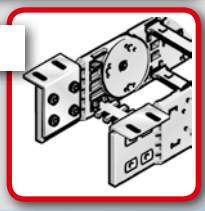


Step 2

System overview

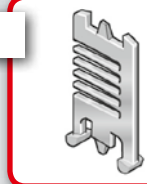
1 Chain bracket

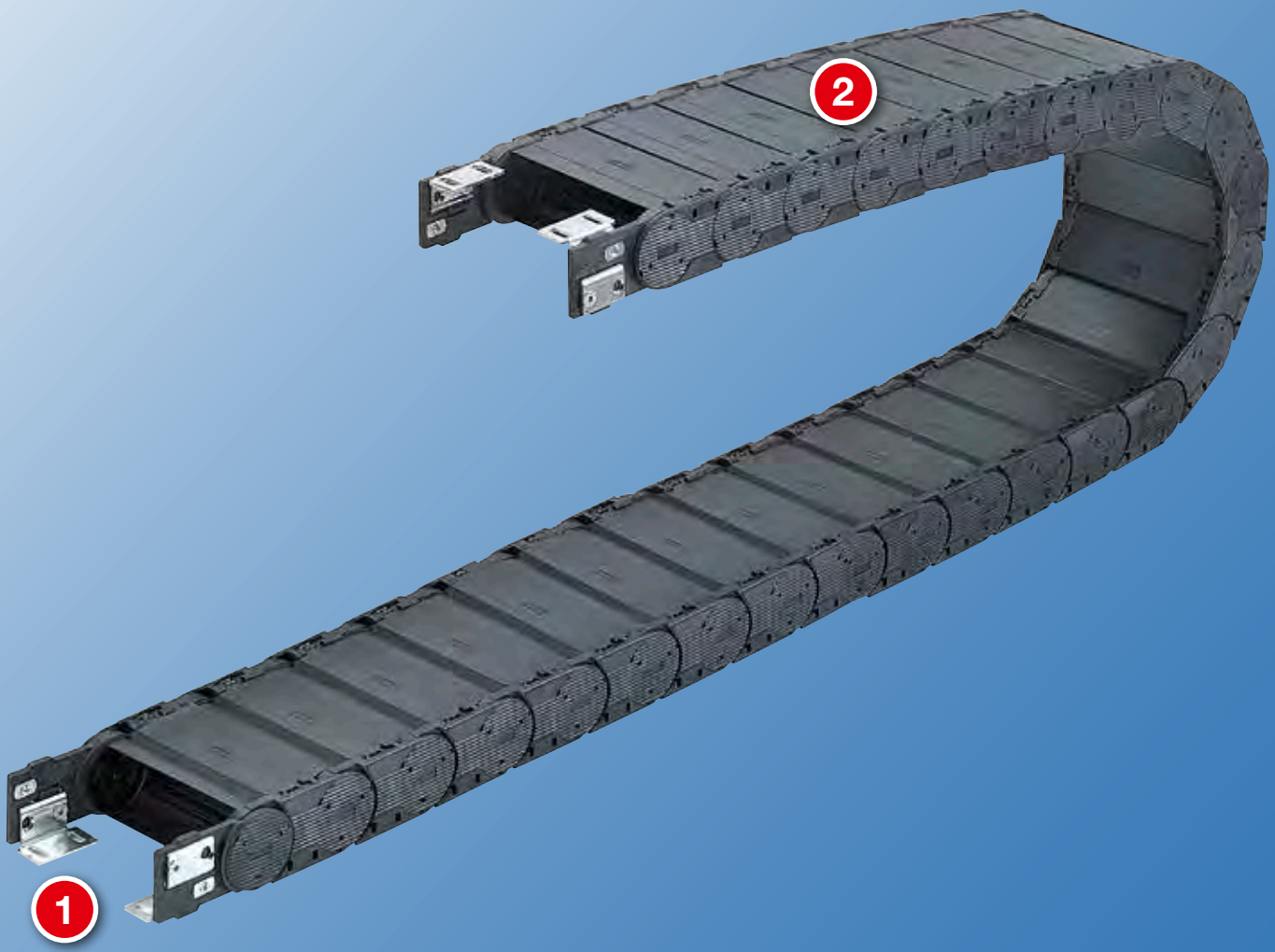
Chain bracket angle



2 Shelving system

Separator TR

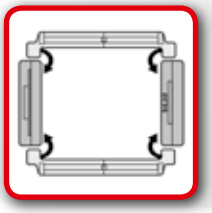




Guide channels

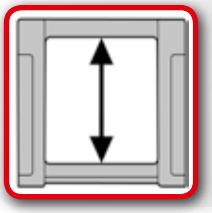
Aluminium VAW

Technical data



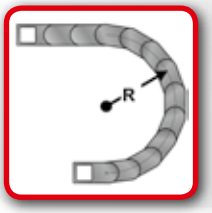
Loading side

inside and outside flexure curve



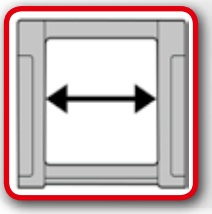
Available interior heights

38.0 mm



Available radii

125.0 – 250.0 mm



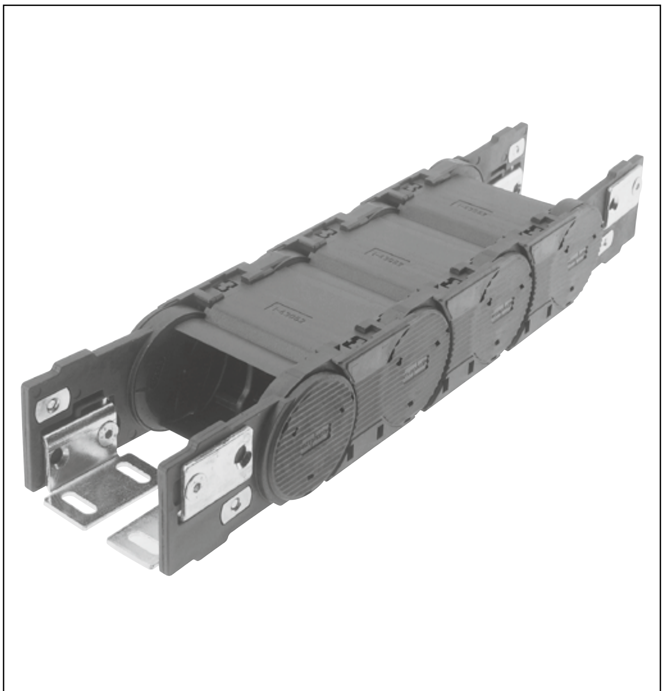
Available interior widths

62.0 – 182.0 mm

Ordering key

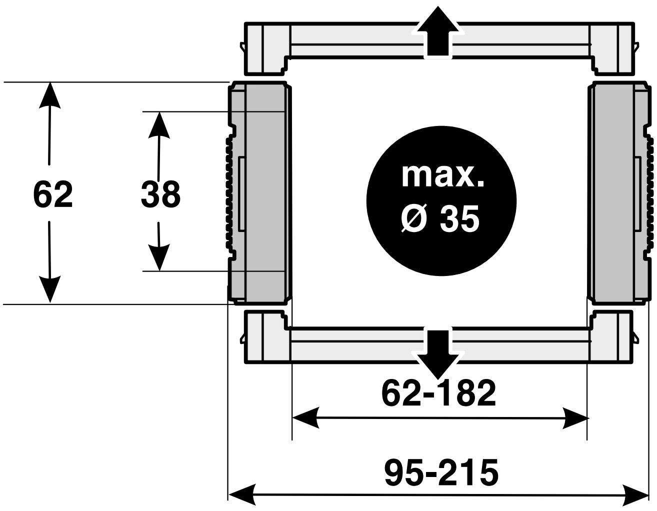
Type	Variation	Inside width mm	Outside width mm	Radius mm	Ridge version	Material	Chain length mm
0430	44	62 84 105 144 182	95 117 138 177 215	125 150 200 250	0 1 9	0 9	

Ordering key ____ __ ___ ___ _ _ ______



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
1	PA full-ridged without bias
9	Special version

44	Cover on outside of radius Cover on inside of radius Opens on inside and outside of radius

Order sample: 0430 44 062 125 0 0 1435
Cover in outside bend, cover in inside bend, openable from inside and outside bend
Inside width 62 mm; radius 125 mm
Plastic bridge, full-ridged with bias, material black-coloured polyamide
Chain length 1435 mm (19 links)

Technical specifications

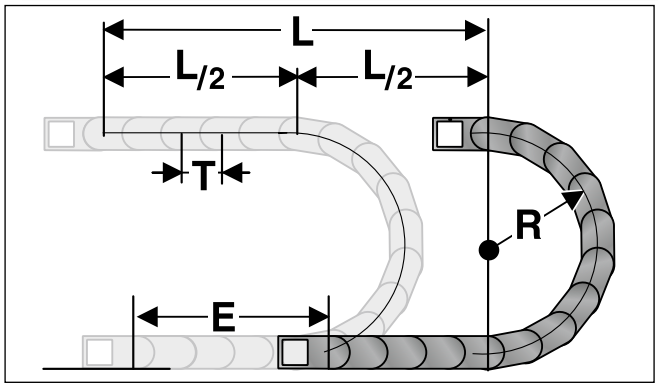
Travel distance gliding L_g max.:	50.0 m
Travel distance self-supporting L_f max.:	see diagram
Travel distance vertical, hanging L_{vh} max.:	40.0 m
Travel distance vertical, upright L_{vs} max.:	3.0 m
Rotated 90°, unsupported L_{90f} max.:	1.0 m
Speed, gliding V_g max.:	5.0 m/s
Speed, self-supporting V_f max.:	15.0 m/s
Acceleration, gliding a_g max.:	15.0 m/s²
Acceleration, self-supporting a_f max.:	20.0 m/s²

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

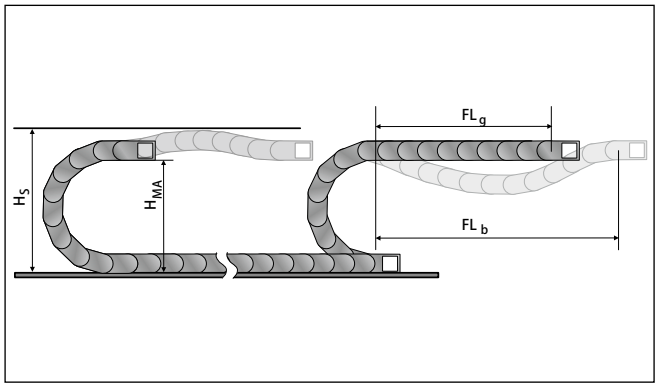


The fixed point of the cable drag chain should be connected in the middle of the travel distance.
This arrangement gives the shortest connection between the fixed point and the moving consumer and thus the most efficient chain length.

Chain length calculation = L/2 + π * R + E
≈ 1 m chain = 13 qty. x 75.5 mm links.

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

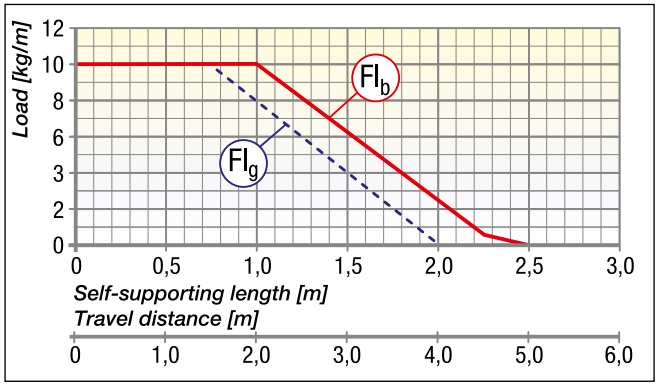
Self-supporting length



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

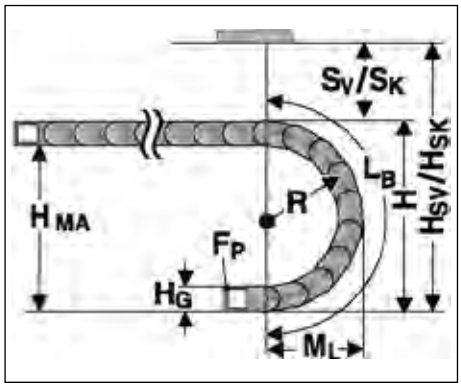
Load diagram for self-supporting applications



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

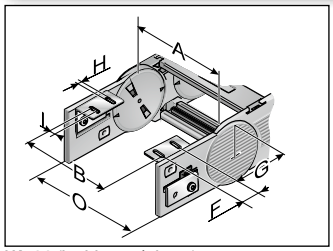
FL_b Self-supporting Length, upper run bent
In the FL_b range, the chain upper run has a sag of more than , but this is still less than the maximum sag.
Where the sag is greater than that permitted in the FL_b range, the application is critical and should be avoided. The self-supporting length can be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

Installation dimensions

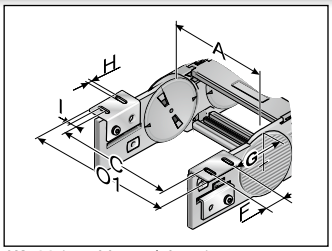


Radius R	125	150	200	250
Outside height of chain link (H_G)	62	62	62	62
Height of bend (H)	312	362	462	562
Height of moving end connection (H_{MA})	250	300	400	500
Safety margin with bias (S_V)	38	38	38	38
Installation height with bias (H_{SV})	350	400	500	600
Safety margin without bias (S_K)	13	13	13	13
Installation height without bias (H_{SK})	325	375	475	575
Arc projection (M_L)	232	257	307	357
Bend length (L_B)	565	644	801	958

Chain bracket angle



KA 44 (inside up / down)

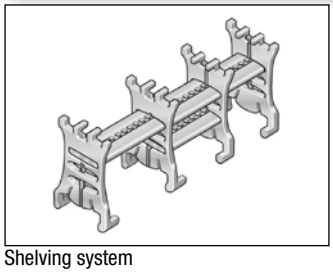


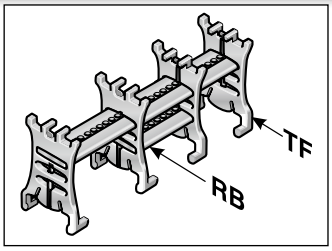
KA 44 (outside up / down)

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 two chain brackets. The brackets should be fastened with M6 screws.

Type	Order no.	Material	Inside width A mm	B mm	C mm	E mm	F mm	G mm	HØ mm	I mm	Outside width KA O mm	Outside width KA O1 mm
KA 44	0440000050	Sheet steel	62.0 – 182.0	A-14.5	A+38.5	A+32.0	32.0	43.2	6.5	12.5	A+33.0	A+64.0
KA 44	0440000052	Stainless steel 1.4301	62.0 – 182.0	A-14.5	A+38.5	A+32.0	32.0	43.2	6.5	12.5	A+33.0	A+64.0

Shelving system



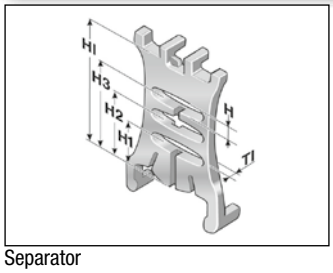


Shelving system

The shelf must be used with a minimum of two separators to create a shelving system. The additional levels prevent cables from criss-crossing and therefore destroying each other, while also avoiding excessive friction. The shelves are matched to the available chain widths.

Type	Order no.	Designation	Width mm	Pitch mm
RB 031	100000003100	Shelf	31.0	1.6
RB 048	100000004800	Shelf	48.0	1.6
RB 070	100000007000	Shelf	70.0	1.6
RB 092	100000009200	Shelf	92.0	1.6
RB 128	100000012800	Shelf	128.0	1.6
RB 167	100000016700	Shelf	167.0	1.6

Separator

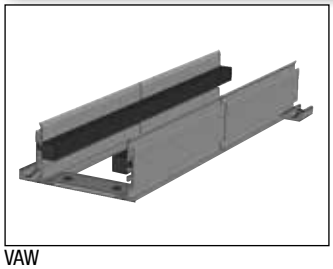


Separator

We recommend that moveable separators are used if multiple round cables or conduits with differing diameters are to be installed. An offset configuration of the separators is advisable. The separator will stay solidly assembled at one side when the frame bridge is opened.

Type	Order no.	Designation	Pitch mm	Tl mm	H mm	H1 mm	H2 mm	H3 mm	Hl mm
TF 43	0430000090	Separator	1.6	4.0	4.3	12.3	19.5	26.5	38.0

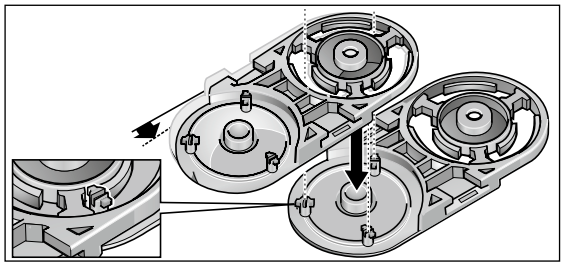
Guide channels (VAW)



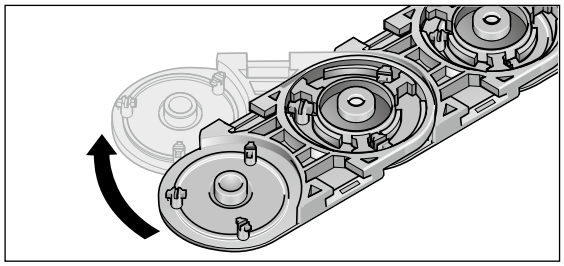
VAW

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“.

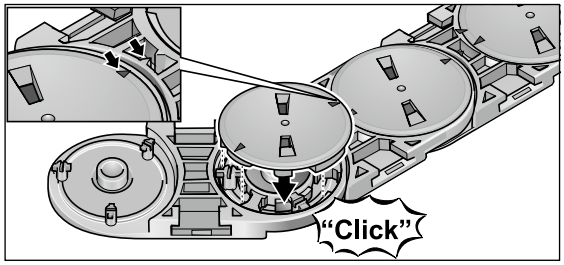
Assembly



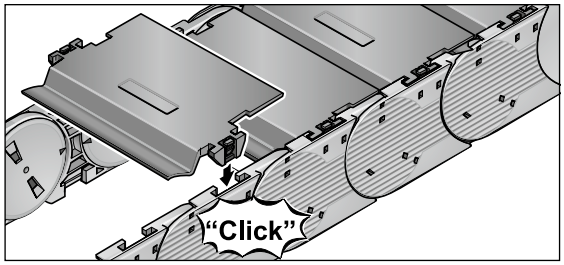
Step 1



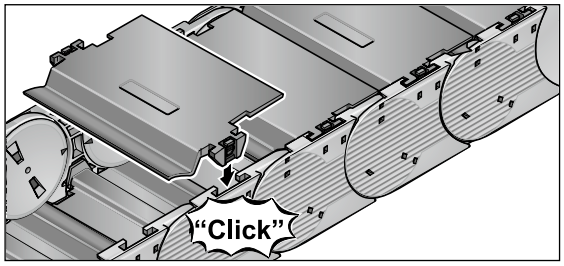
Step 2



Step 3

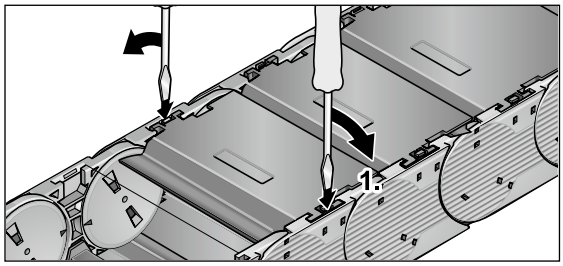


Step 4

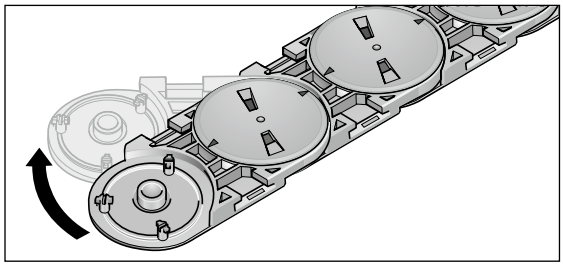


Step 5

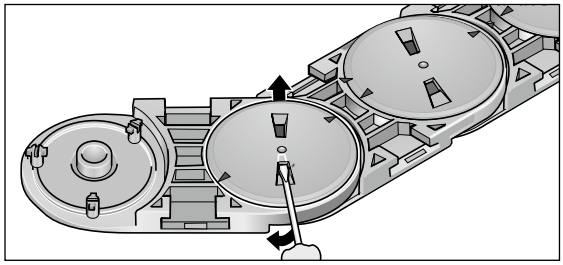
Disassembly



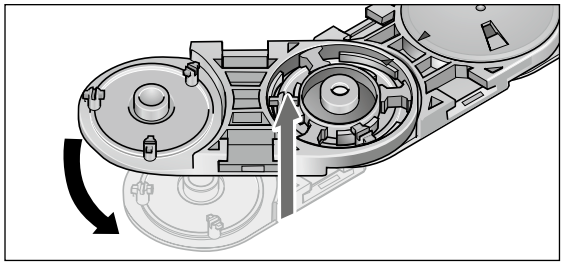
Step 1



Step 2



Step 3

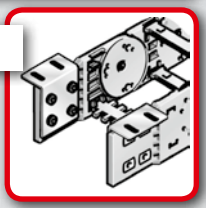


Step 4

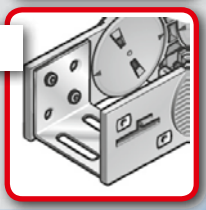
System overview

1 Chain bracket

Chain bracket angle

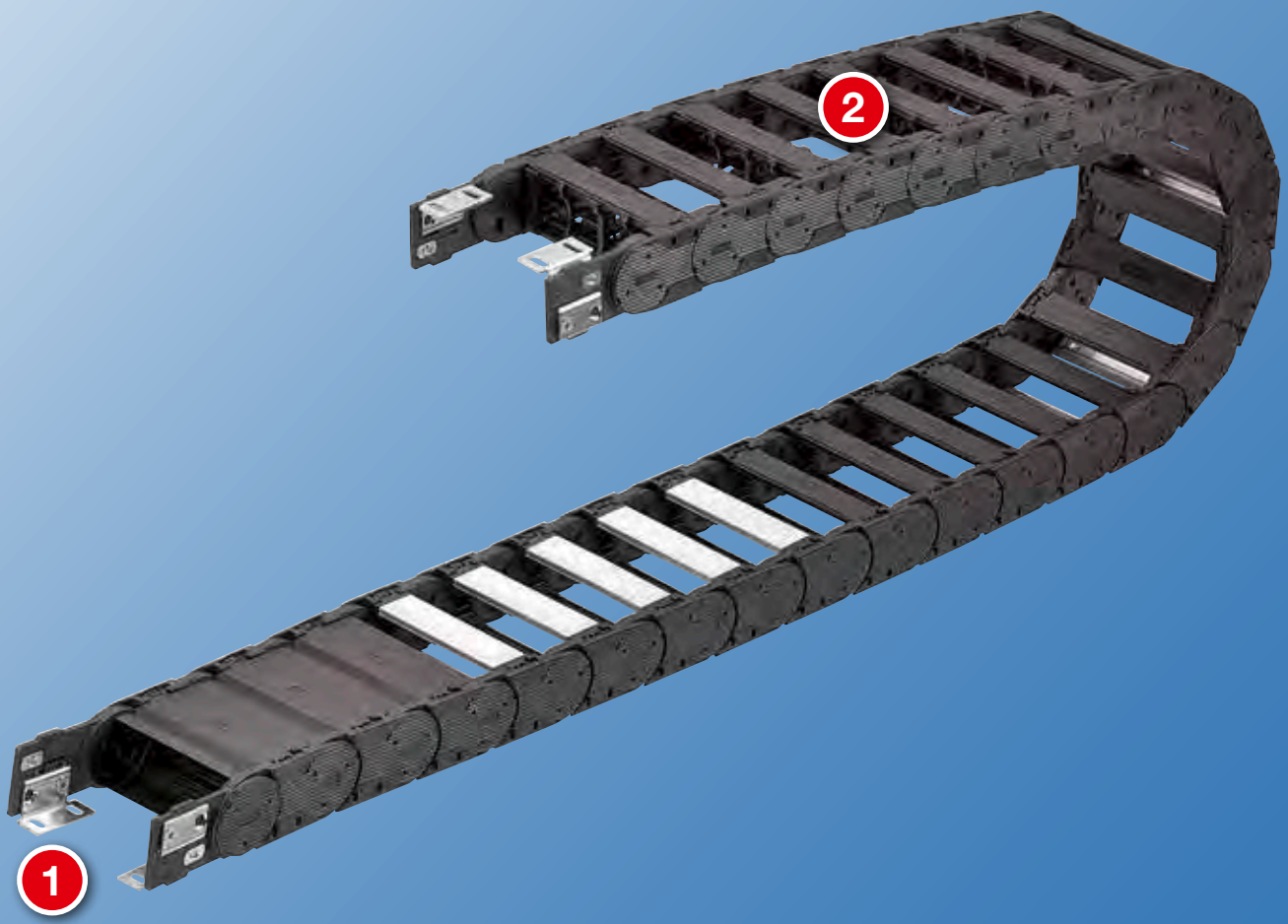


Chain bracket U-part



2 Shelving system

Separator TR

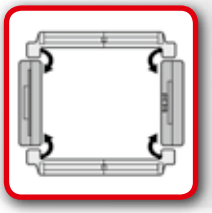


Guide channels

Aluminium VAW

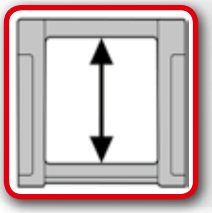
Stainless steel VAW-E

Technical data



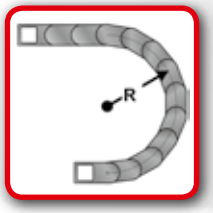
Loading side

inside and outside flexure curve



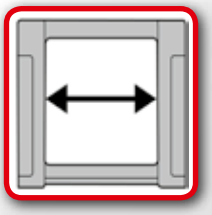
Available interior heights

40.0 mm



Available radii

90.0 – 250.0 mm



Available interior widths

45.0 – 182.0 mm

With aluminium frame bridge
70.0 – 600.0 mm

Ordering key

Type	Variation	Inside width mm	Outside width mm	Radius mm	Ridge version	Material	Chain length mm
0440	30	45	78	90	0	0	
		62	95	125	1	9	
		84	117	150	2		
		105	138	200	3		
		144	177	250	4		
		182	215		5		
					6		
					7		
					9		

Ordering key ____ __ ___ ___ _ _ ______

Note on configuration

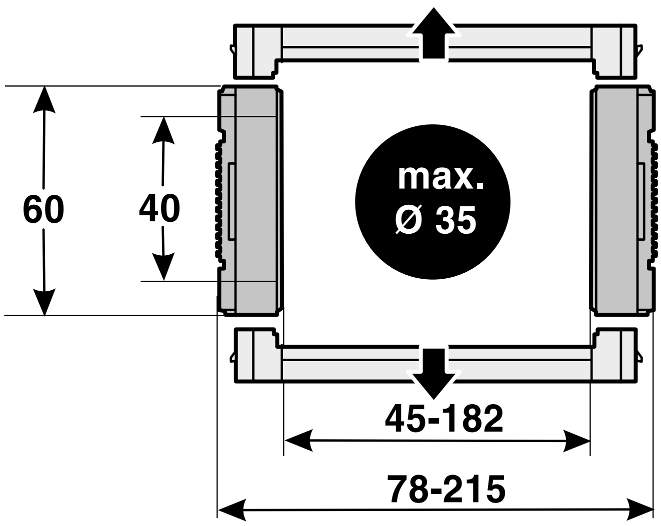
Frame bridges and cover from aluminium:
Aluminium frame bridges and covers can be supplied in 1 mm width sizes for inner widths from 70.0 mm – 600.0 mm.
If frame bridge strain relief plates (RS-ZL) are to be deployed, take standard widths into account.

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
1	PA full-ridged without bias
2	PA half-ridged with bias
3	PA half-ridged without bias
4	Aluminium full-ridged with bias
5	Aluminium full-ridged without bias
6	Aluminium half-ridged with bias
7	Aluminium half-ridged without 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: 0440 30 045 090 0 0 1359
Frame bridge in outside bend, frame bridge in inside bend, can be opened from inside and outside bend
Inside width 45 mm; radius 90 mm
Plastic bridge, full-ridged with bias, material black-coloured polyamide
Chain length 1359 mm (18 links)

Technical specifications

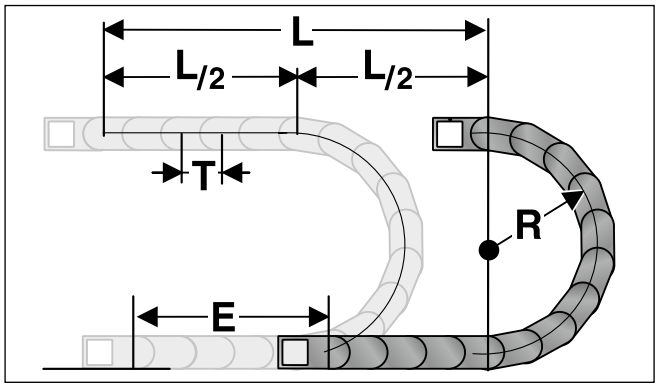
Travel distance gliding L_g max.:	50.0 m
Travel distance self-supporting L_f max.:	see diagram
Travel distance vertical, hanging L_{vh} max.:	40.0 m
Travel distance vertical, upright L_{vs} max.:	3.0 m
Rotated 90°, unsupported L_{90f} max.:	1.0 m
Speed, gliding V_g max.:	5.0 m/s
Speed, self-supporting V_f max.:	15.0 m/s
Acceleration, gliding a_g max.:	15.0 m/s²
Acceleration, self-supporting a_f max.:	20.0 m/s²

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

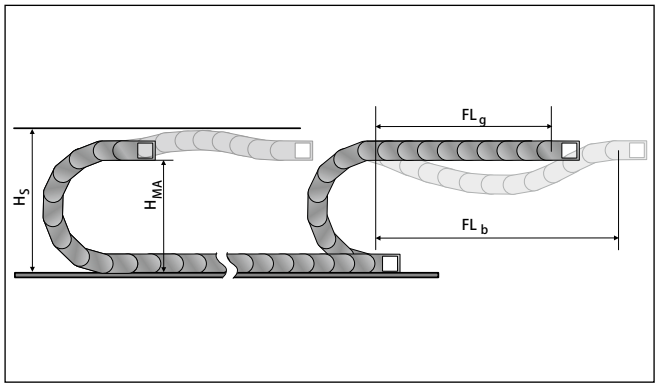


The fixed point of the cable drag chain should be connected in the middle of the travel distance.
This arrangement gives the shortest connection between the fixed point and the moving consumer and thus the most efficient chain length.

Chain length calculation = L/2 + π * R + E
≈ 1 m chain = 13 qty. x 75.5 mm links.

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

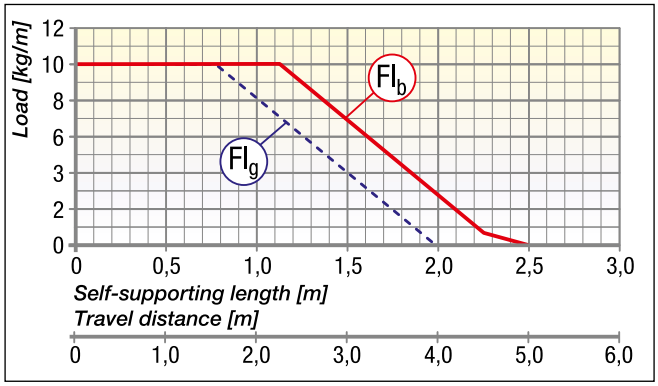
Self-supporting length



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

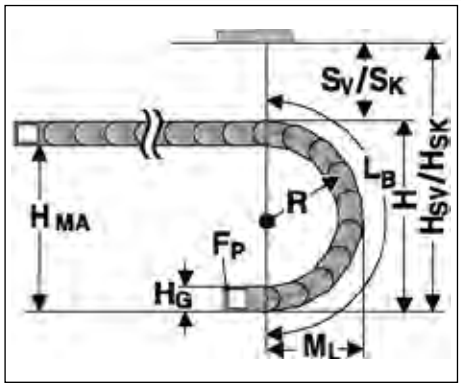
Load diagram for self-supporting applications



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

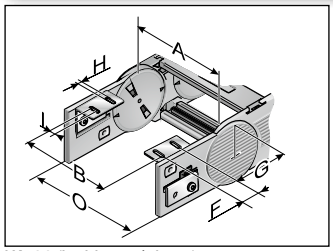
FL_b Self-supporting Length, upper run bent
In the FL_b range, the chain upper run has a sag of more than , but this is still less than the maximum sag.
Where the sag is greater than that permitted in the FL_b range, the application is critical and should be avoided. The self-supporting length can be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

Installation dimensions

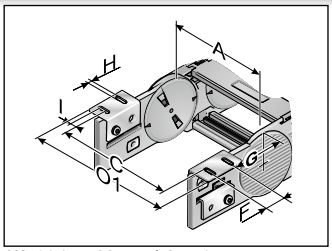


Radius R	90	125	150	200	250
Outside height of chain link (H_G)	60	60	60	60	60
Height of bend (H)	240	310	360	460	560
Height of moving end connection (H_{MA})	180	250	300	400	500
Safety margin with bias (S_V)	38	38	38	38	38
Installation height with bias (H_{SV})	278	348	398	498	598
Safety margin without bias (S_K)	13	13	13	13	13
Installation height without bias (H_{SK})	253	323	373	473	573
Arc projection (M_L)	196	231	256	306	356
Bend length (L_B)	452	562	641	798	955

Chain bracket angle



KA 44 (inside up / down)

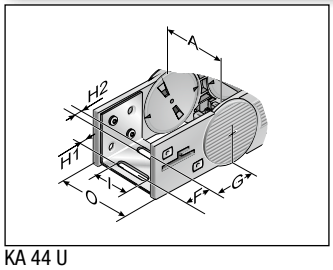


KA 44 (outside up / down)

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 two chain brackets. The brackets should be fastened with M6 screws.

Type	Order no.	Material	Inside width A mm	B mm	C mm	E mm	F mm	G mm	HØ mm	I mm	Outside width KA O mm	Outside width KA O1 mm
KA 44	0440000050	Sheet steel	62.0 – 182.0	A-14.5	A+38.5	A+32.0	32.0	43.2	6.5	12.5	A+33.0	A+64.0
KA 44	0440000052	Stainless steel 1.4301	62.0 – 182.0	A-14.5	A+38.5	A+32.0	32.0	43.2	6.5	12.5	A+33.0	A+64.0

Chain bracket U-part

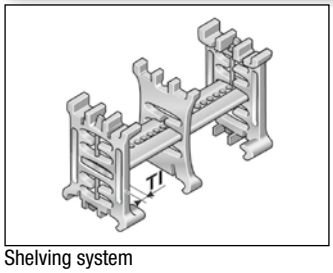


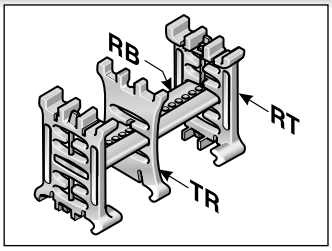
KA 44 U

As standard, this chain bracket is supplied in a width of 45 mm. Bracket can be mounted up or down.

Type	Order no.	Material	Inside width A mm	F mm	G mm	H1 mm	H2 mm	I mm	Outside width KA O mm
KA 44 U	0440000054	Sheet steel	45.0	28.0	45.0	6.5	8.5	33.0	A+33.0

Shelving system



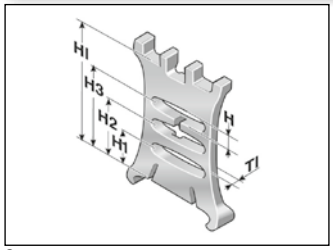


Shelving system

In connection with at least two shelf supports (RT) 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	TI mm
RB 031	100000003100	Shelf	31.0	1.6	
RB 048	100000004800	Shelf	48.0	1.6	
RB 070	100000007000	Shelf	70.0	1.6	
RB 092	100000009200	Shelf	92.0	1.6	
RB 100	100000010000	Shelf	100.0	1.6	
RB 128	100000012800	Shelf	128.0	1.6	
RB 167	100000016700	Shelf	167.0	1.6	
RT 44	1000902100	Shelf support		1.6	6.5

Separator

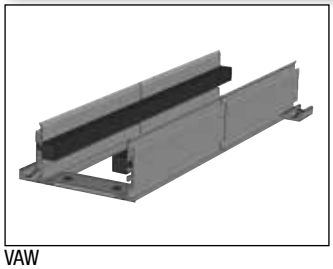


Separator

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. The TL 44 should be used for applications with aluminium frame bridges or movable separators.

Type	Order no.	Designation	Pitch mm	TI mm	H mm	H1 mm	H2 mm	H3 mm	HI mm
TF 44	044000009400	RSV 32 Crossbar connector	1.6	4.0	4.4	15.0	22.4	29.4	40.0
TL 44	044000009200	RSV 32 Crossbar connector for aluminium frame bridges	1.6	4.0	4.4	15.2	22.3	29.4	40.0

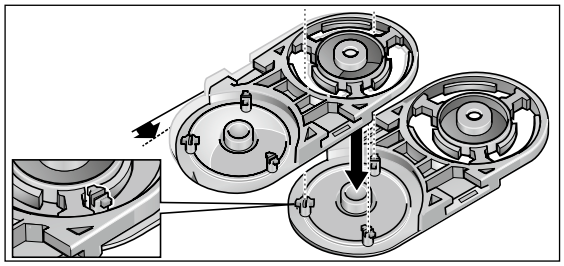
Guide channels (VAW)



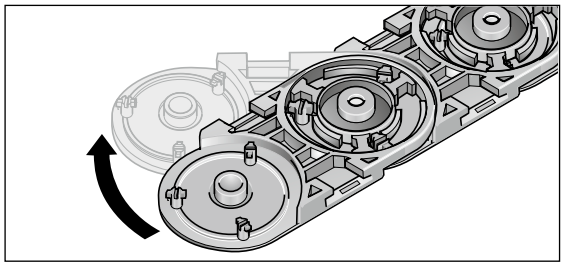
VAW

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“.

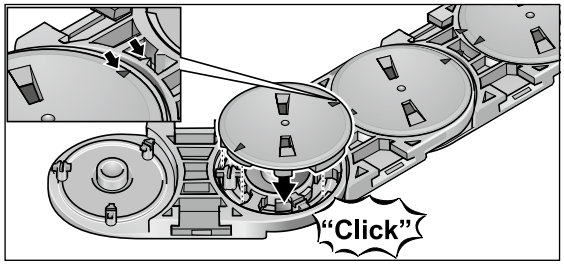
Assembly



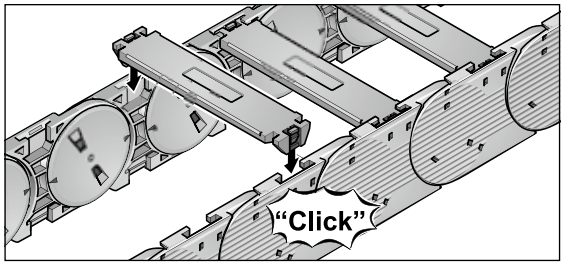
Step 1



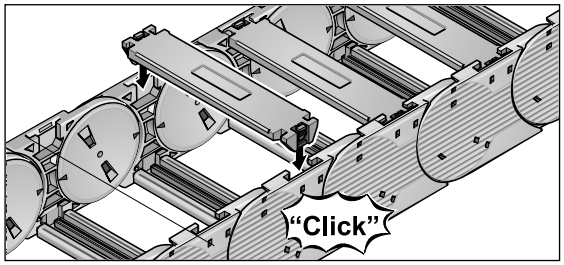
Step 2



Step 3

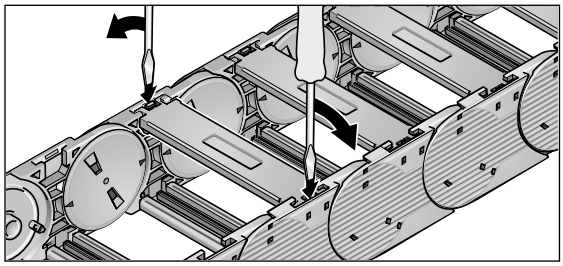


Step 4

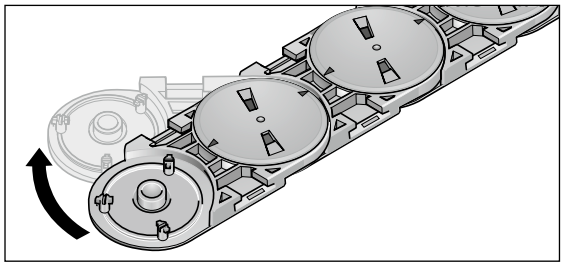


Step 5

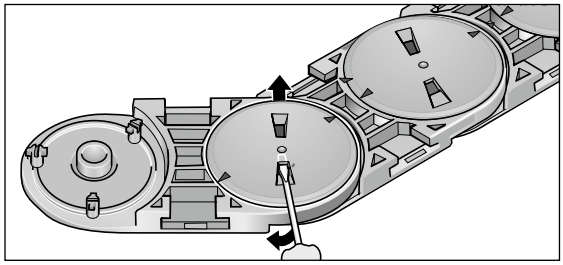
Disassembly



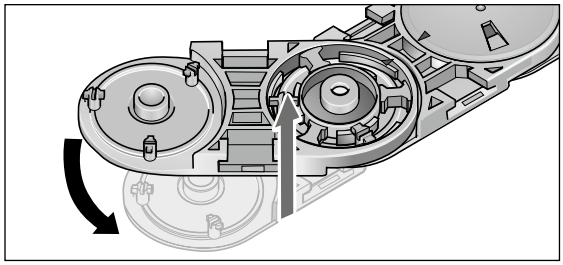
Step 1



Step 2



Step 3

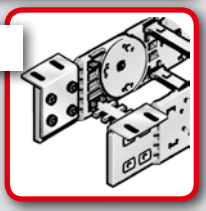


Step 4

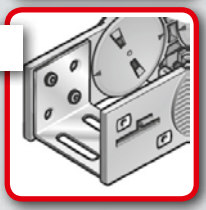
System overview

1 Chain bracket

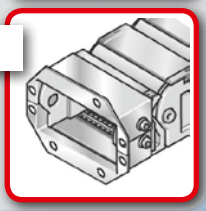
Chain bracket angle



Chain bracket U-part



End brackets flange



2 Shelving system

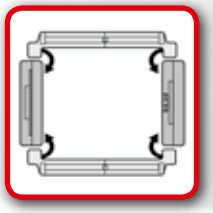
Separator TR

Guide channels

Aluminium VAW

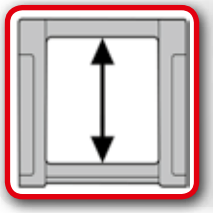
Stainless steel VAW-E

Technical data



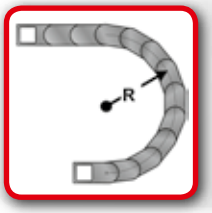
Loading side

inside and outside flexure curve



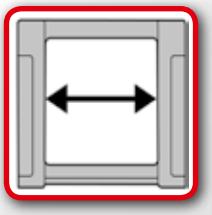
Available interior heights

60.0 mm



Available radii

150.0 – 400.0 mm



Available interior widths

45.0 – 182.0 mm

With aluminium frame bridge
70.0 – 600.0 mm

Ordering key

Type	Variation	Inside width mm	Outside width mm	Radius mm	Ridge version	Material	Chain length mm
0660 0650	30 44	45[1] 62[1] 84 105 144 182[1]	79[1] 96[1] 118 139 178 216[1]	150[1] 200 240 280 350 400	0 1 2[1] 3[1] 4[1] 5[1] 6[1] 7[1] 9	0 9	

[1] for variant 30 only

Ordering key

Note on configuration

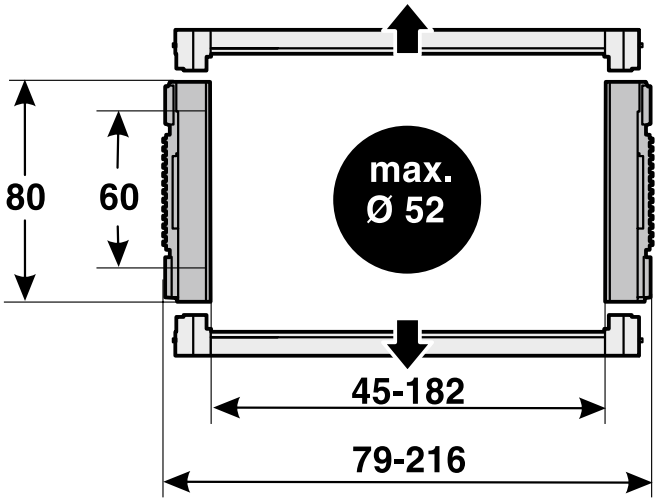
Frame bridges and cover from aluminium:
Aluminium frame bridges and covers can be supplied in 1 mm width sizes for inner widths from 70.0 mm – 600.0 mm.
If frame bridge strain relief plates (RS-ZL) are to be deployed, take standard widths into account.

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
1	PA full-ridged without bias
2	PA half-ridged with bias
3	PA half-ridged without bias
4	Aluminium full-ridged with bias
5	Aluminium full-ridged without bias
6	Aluminium half-ridged with bias
7	Aluminium half-ridged without bias
9	Special version

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

Order sample: 0660 30 045 150 0 0 1556
Frame bridge in outside bend, frame bridge in inside bend, can be opened from inside and outside bend
Inside width 45 mm; radius 150 mm
Plastic bridge, full-ridged with bias, material black-coloured polyamide
Chain length 1556 mm (17 links)

Technical specifications

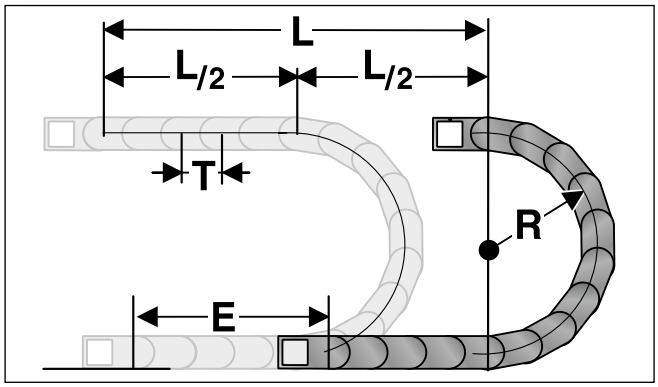
Travel distance gliding L_g max.:	60.0 m
Travel distance self-supporting L_f max.:	see diagram
Travel distance vertical, hanging L_{vh} max.:	50.0 m
Travel distance vertical, upright L_{vs} max.:	5.0 m
Rotated 90°, unsupported L_{90f} max.:	2.0 m
Speed, gliding V_g max.:	5.0 m/s
Speed, self-supporting V_f max.:	15.0 m/s
Acceleration, gliding a_g max.:	15.0 m/s²
Acceleration, self-supporting a_f max.:	20.0 m/s²

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

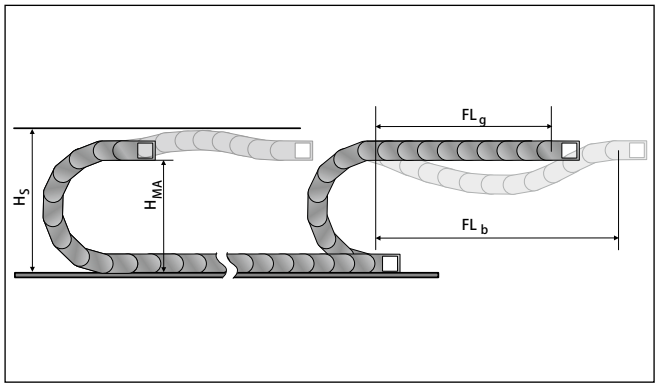


The fixed point of the cable drag chain should be connected in the middle of the travel distance.
This arrangement gives the shortest connection between the fixed point and the moving consumer and thus the most efficient chain length.

Chain length calculation = L/2 + π * R + E
≈ 1 m chain = 11 qty. x 91.5 mm links.

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

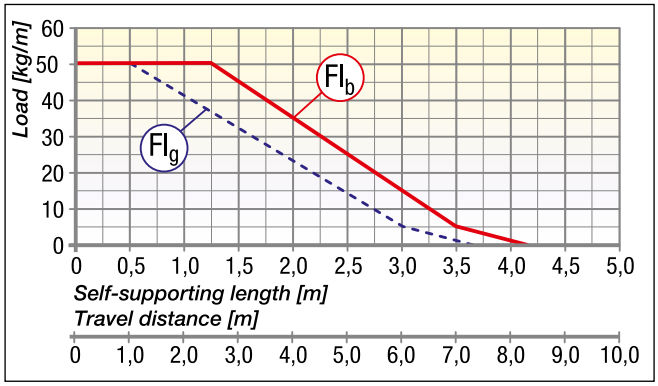
Self-supporting length



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

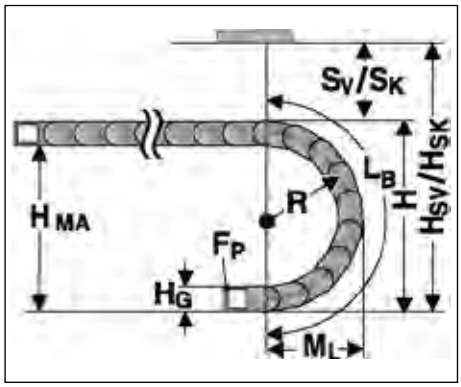
Load diagram for self-supporting applications



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

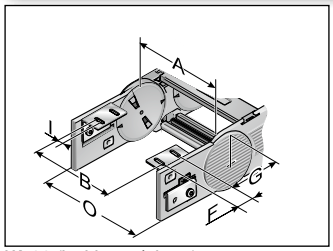
FL_b Self-supporting Length, upper run bent
In the FL_b range, the chain upper run has a sag of more than , but this is still less than the maximum sag.
Where the sag is greater than that permitted in the FL_b range, the application is critical and should be avoided. The self-supporting length can be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

Installation dimensions

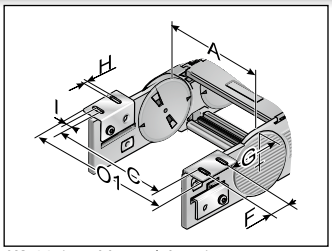


Radius R	150	200	240	280	350	400
Outside height of chain link (H_G)	80	80	80	80	80	80
Height of bend (H)	380	480	560	640	780	880
Height of moving end connection (H_{MA})	300	400	480	560	700	800
Safety margin with bias (S_V)	50	50	50	50	50	50
Installation height with bias (H_{SV})	430	530	610	690	830	930
Safety margin without bias (S_K)	15	15	15	15	15	15
Installation height without bias (H_{SK})	395	495	575	655	795	895
Arc projection (M_L)	282	332	372	412	482	532
Bend length (L_B)	688	845	971	1096	1316	1473

Chain bracket angle



KA 66 (inside up / down)

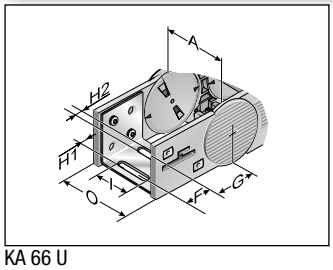


KA 66 (outside up / down)

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 two chain brackets. The brackets should be fastened with M8 screws.

Type	Order no.	Material	Inside width A mm	B mm	C mm	F mm	G mm	HØ mm	I mm	Outside width KA O mm	Outside width KA O1 mm
KA 66	0660000050	Sheet steel	62.0 – 182.0	A-17.0	A+51.0	45.0	50.5	9.0	10.0	A+34.0	A+64.0
KA 66	0660000060	Stainless steel 1.4301	62.0 – 182.0	A-17.0	A+51.0	45.0	50.5	9.0	10.0	A+34.0	A+64.0

Chain bracket U-part

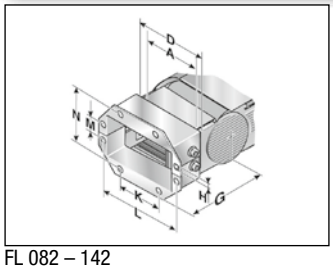


KA 66 U

As standard, this chain bracket is supplied in a width of 45 mm. Bracket can be mounted up or down.

Type	Order no.	Material	Inside width A mm	F mm	G mm	H1 mm	H2 mm	I mm	Outside width KA O mm
KA 66 U	0660000054	Sheet steel	45.0	28.0	58.5	6.5	8.5	33.0	A+34.0

End brackets flange

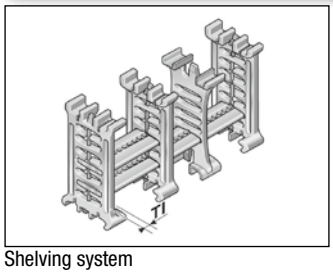


FL 082 – 142

A cable drag chain requires two chain brackets. The divisible flange connection has been specifically designed for commissioning and re-installation. This keeps the chain in the installed position.

Type	Order no.	Material	Inside width A mm	G mm	HØ mm	K mm	L mm	M mm	N mm
FL 082	0650000070	Sheet steel	86.0	60.4	7.0	78.0	141.5	40.0	105.0
FL 107	0650000072	Sheet steel	102.0	60.4	7.0	100.0	163.5	40.0	105.0
FL 142	0650000074	Sheet steel	125.0	60.4	7.0	138.0	201.5	40.0	105.0
FL 082	0650000080	Stainless steel 1.4301	86.0	60.4	7.0	78.0	141.5	40.0	105.0
FL 107	0650000082	Stainless steel 1.4301	102.0	60.4	7.0	100.0	163.5	40.0	105.0
FL 142	0650000084	Stainless steel 1.4301	125.0	60.4	7.0	138.0	201.5	40.0	105.0

Shelving system

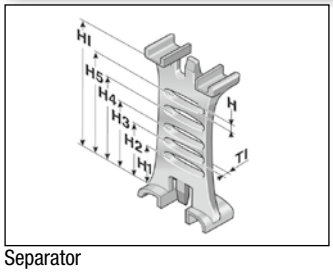


Shelving system

In connection with at least two shelf supports (RT) 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	TI mm
RB 031	100000003100	Shelf	31.0	1.6	
RB 048	100000004800	Shelf	48.0	1.6	
RB 070	100000007000	Shelf	70.0	1.6	
RB 092	100000009200	Shelf	92.0	1.6	
RB 100	100000010000	Shelf	100.0	1.6	
RB 128	100000012800	Shelf	128.0	1.6	
RB 167	100000016700	Shelf	167.0	1.6	
RT 66	1000900100	Shelf support		1.6	6.5

Separator

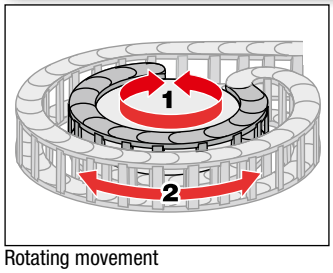


Separator

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	Hl mm
TV 66	066000009000	Separator	1.6	3.5	4.4	18.0	25.1	32.2	39.3	46.4	60.0

Back radii

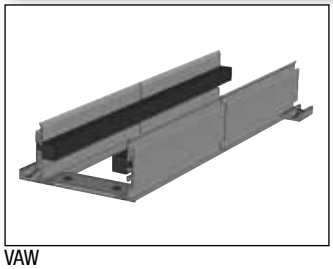


Rotating movement

Side links with radius forward (R) and radius backward (Rü) allow for movement in two directions. This is intended for rotating movements and lowered chain brackets.

Type	Order no.	Back radius mm	Version
SR 66 (RÜ240)	066000000060	240.0	Available for radii 150, 200, 240, 280 and 350 mm

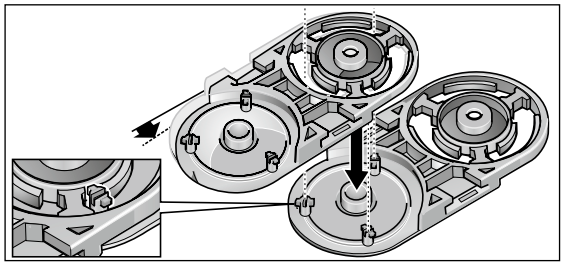
Guide channels (VAW)



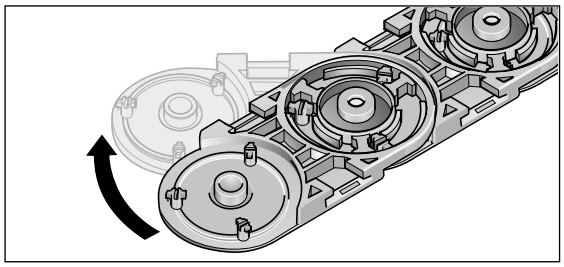
VAW

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“.

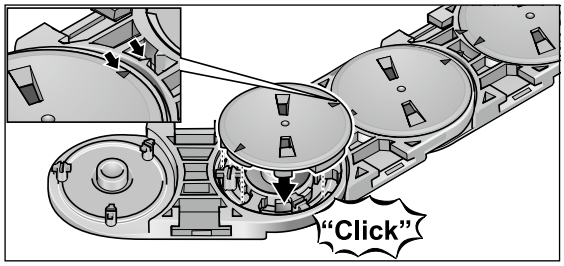
Assembly



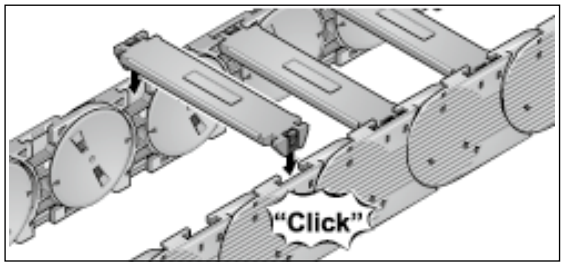
Step 1



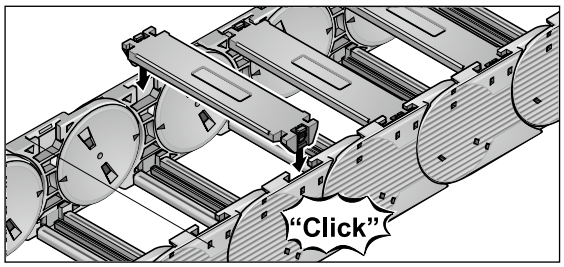
Step 2



Step 3

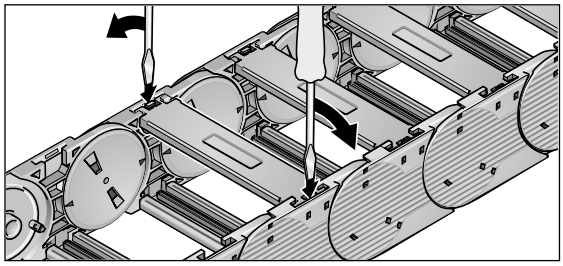


Step 4

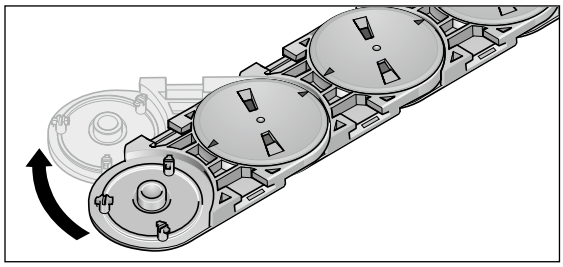


Step 5

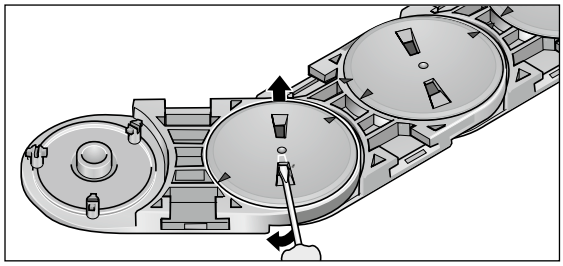
Disassembly



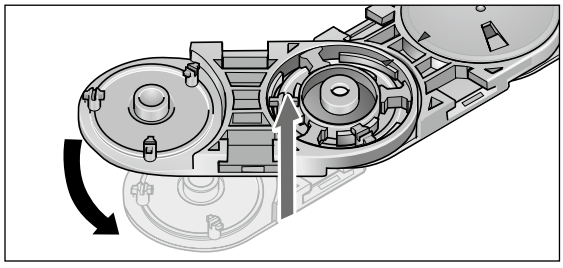
Step 1



Step 2



Step 3

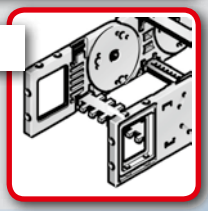


Step 4

System overview

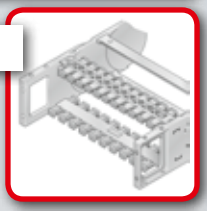
1 Chain bracket

Chain bracket flexible

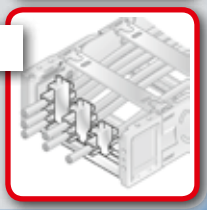


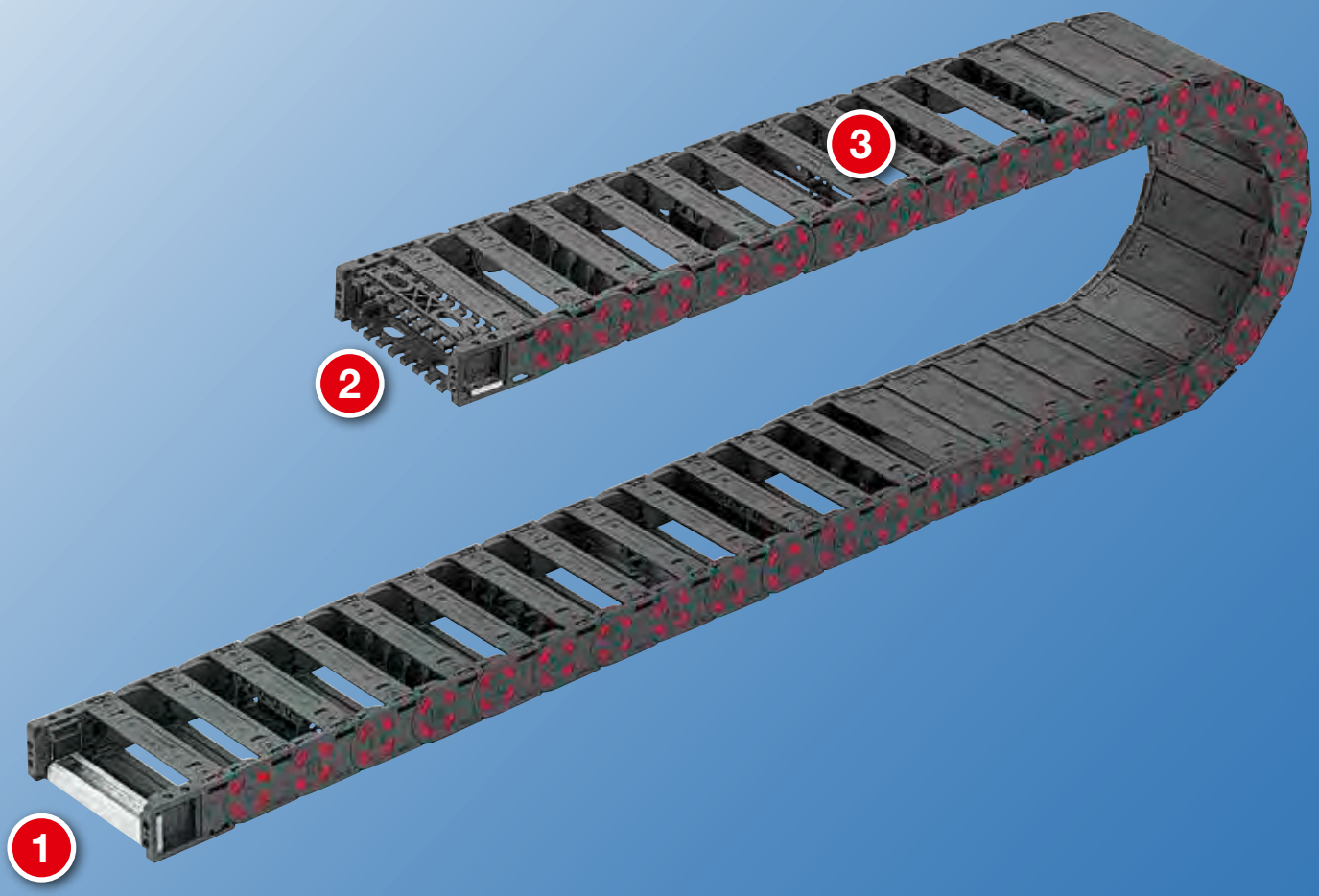
2 Strain relief

Frame bridge RS-ZL



STF Steel Fix





3 Shelving system

Separator TR

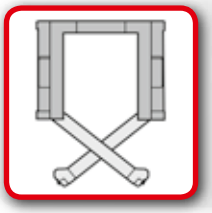
Shelf, end-to-end RBD

Guide channels

Aluminium VAW

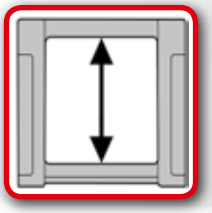
Stainless steel VAW-E

Technical data



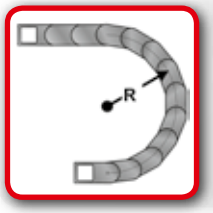
Loading side

Inside or outside flexure curve



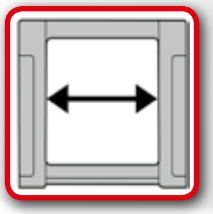
Available interior heights

25.0 mm



Available radii

50.0 – 300.0 mm



Available interior widths

40.0 – 200.0 mm

Ordering key

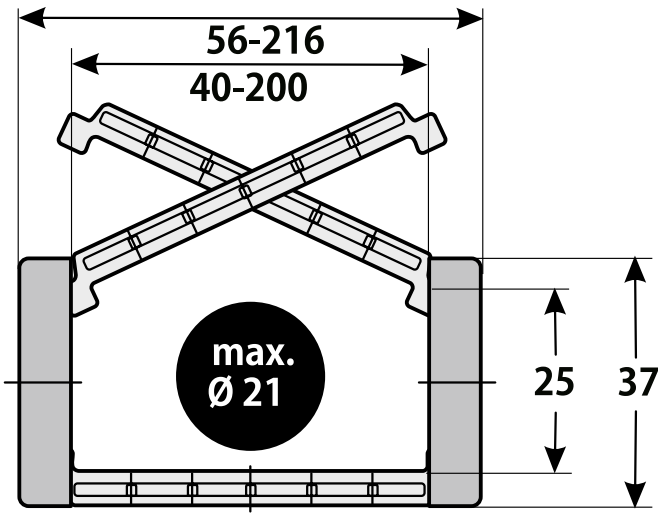
Type	Variation	Inside width mm	Outside width mm	Radius mm	Ridge version	Material	Chain length mm
0025	01	40	56	50[1]	0	0	
	02	50	66	75[1]	1	9	
	03	60	76	100			
	04	75	91	125			
	05	85	101	150			
	06	100	116	200			
	07	125	141	250			
	08	150	166	300			
		200	216				

[1] for Variant 30 only

Ordering key _

Chain link

Loading side: Inside or outside flexure curve



Dimensions in mm

0 Standard (PA/black)
9 Special version

0 PA full-ridged with bias
1 PA full-ridged without bias

01 Frame bridge on outside of radius
Frame bridge on inside of radius
Opens on outside of radius
02 Frame bridge on outside of radius
Frame bridge on inside of radius
Opens on inside of radius
03 Cover on outside of radius
Cover on inside of radius
Opens on outside of radius
04 Cover on outside of radius
Cover on inside of radius
Opens on inside of radius
05 Cover on outside of radius
Frame bridge on inside of radius
Opens on outside of radius
06 Cover on outside of radius
Frame bridge on inside of radius
Opens on inside of radius
07 Frame bridge on outside of radius
Cover on inside of radius
Opens on outside of radius
08 Frame bridge on outside of radius
Cover on inside of radius
Opens on inside of radius

Order sample: 0025 01 040 050 0 0 1250
Frame bridge in outside bend, frame bridge in inside bend, can be opened from outside bend
Inside width 40 mm; radius 50 mm
Plastic bridge, full-ridged with bias, material black-coloured polyamide
Chain length 1125 mm (25 links)

Technical specifications

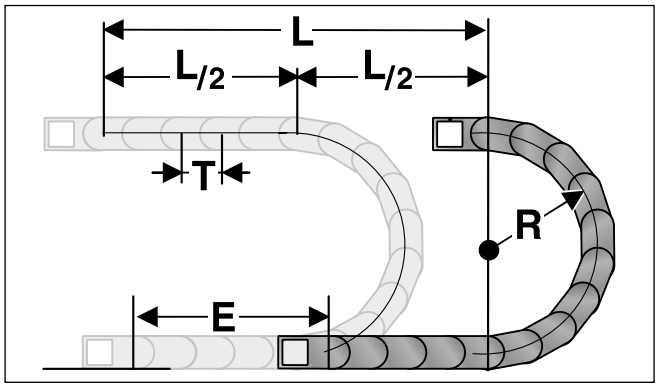
Travel distance gliding L_g max.:	35.0 m
Travel distance self-supporting L_f max.:	see diagram
Travel distance vertical, hanging L_{vh} max.:	25.0 m
Travel distance vertical, upright L_{vs} max.:	3.0 m
Rotated 90°, unsupported L_{90f} max.:	0.7 m
Speed, gliding V_g max.:	3.0 m/s
Speed, self-supporting V_f max.:	10.0 m/s
Acceleration, gliding a_g max.:	10.0 m/s²
Acceleration, self-supporting a_f max.:	15.0 m/s²

Material properties

Standard material:	Polyamide (PA) black
Service temperature:	-20.0 – 100.0 °C
Gliding friction factor:	0.3
Static friction factor:	0.45
Fire classification:	UL 94 HB

Other material properties on request.

Determining the chain length

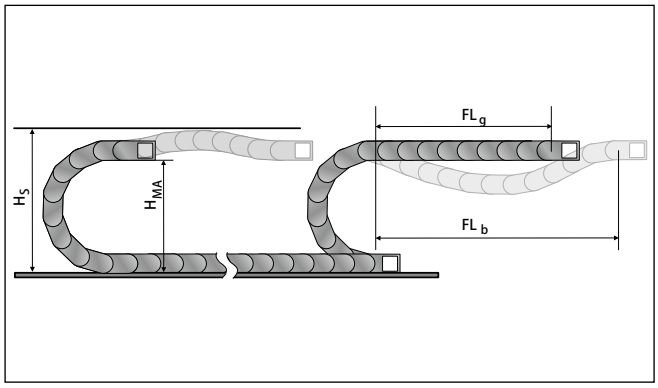


The fixed point of the cable drag chain should be connected in the middle of the travel distance.
This arrangement gives the shortest connection between the fixed point and the moving consumer and thus the most efficient chain length.

Chain length calculation = L/2 + π * R + E
≈ 1 m chain = 22 qty. x 45.0 mm links.

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

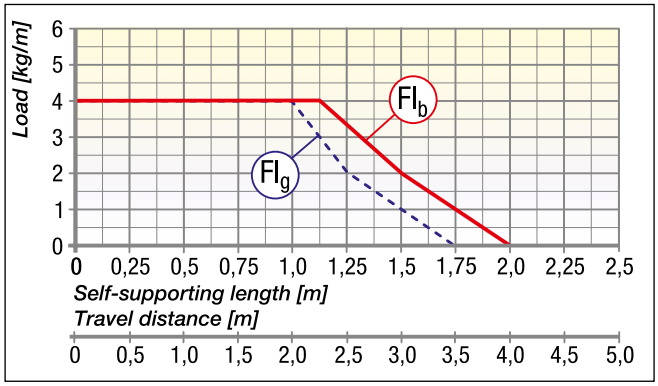
Self-supporting length



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

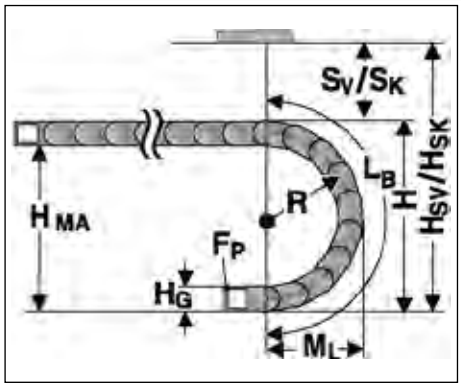
Load diagram for self-supporting applications



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

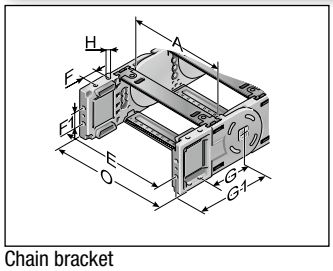
FL_b Self-supporting Length, upper run bent
In the FL_b range, the chain upper run has a sag of more than , but this is still less than the maximum sag.
Where the sag is greater than that permitted in the FL_b range, the application is critical and should be avoided. The self-supporting length can be optimized by using a support for the upper run or a more stable cable drag chain.
Closed cable drag chains (with covers) have a higher unit weight than open chains (with frame bridges). This higher weight must be taken into account when calculating the self-supporting length. To the weight of the cabling (cable load, in kg/m), you must add 0.3 kg/m, to account for the higher weight of closed-cover chains.

Installation dimensions



Radius R	50	75	100	125	150	200	250	300
Outside height of chain link (H_G)	37	37	37	37	37	37	37	37
Height of bend (H)	157	207	257	307	357	457	557	657
Height of moving end connection (H_{MA})	120	170	220	270	320	420	520	620
Safety margin with bias (S_V)	38	38	38	38	38	38	38	38
Installation height with bias (H_{SV})	195	245	295	345	395	495	595	695
Safety margin without bias (S_K)	18	18	18	18	18	18	18	18
Installation height without bias (H_{SK})	175	225	275	325	375	475	575	675
Arc projection (M_L)	124	149	174	199	224	274	324	374
Bend length (L_B)	291	370	448	527	605	762	919	1076

Chain bracket flexible



Chain bracket

This chain bracket offers universal connection options (top, bottom and front) and is attached to the ends of the chain like a side link. This allows the chain to move right up to the bracket. Each chain requires one male and one female bracket. M5 screws and insert panels are used to secure the brackets in place.
By default, the chain bracket is supplied with frame bridges.
The chain connection can then be optionally fitted with frame bridge strain relief RS-ZL or with strain relief using C-rails and bow clamps type STF.

Type	Order no.	Material	Inside width A mm	E mm	F mm	F1 mm	G mm	G1 mm	H	HØ mm	Outside width KA O mm
KA25	KA25ML	Plastic	40.0 – 200.0	A+9.0	12.0	12.0	45.0	72.0	M5	5.5	A+18.0

Configurator chain bracket KA 25

Configurator for chain brackets:

Type KA	Inside width	Radius	RS-ZL No.	C-sections No.	No. of EB**
	mm	mm	Pieces	Pieces	Pieces
KA 25*	085	250	2	0	2

Order sample:

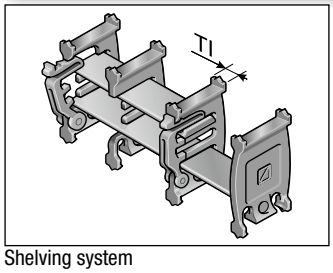
Type	= KA 25 = Chain bracket, flexible, for MP 25
Inner width	= 085 mm
Radius	= 250 mm
Frame bridge strain relief plate (RS-ZL)	= 2 pieces
C-section	= 0 pieces
Insert panel (EB)	= 2 pieces

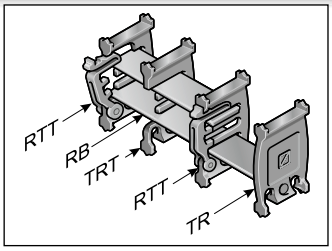
* One set chain bracket is needed per chain, containing male and female end
** Two insert panels (EB) are needed per connection element

Note:

For an exact determination of the chain bracket, the inside width and radius are absolutely essential. Optionally frame bridge strain relief plates (RS-ZL), C-profiles and insert panels (EB) can be chosen.

Shelving system

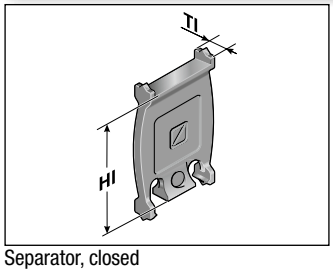




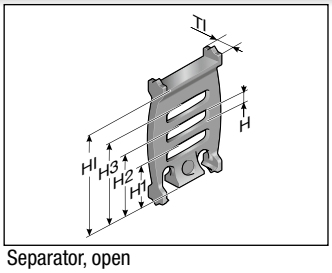
Shelving system

In connection with at least two separable shelf supports RTT or separable separators TRT the shelf becomes a shelving system that can be placed anywhere in the chain link. The shelf RBD creates a horizontal separation over the entire width of the chain link. If necessary the separator TRT can also be built in. The additional levels prevent cables from criss-crossing. Pre-assembly is not necessary as the shelving system and cabling can be assembled quickly and easily on site.

Separator



Separator, closed

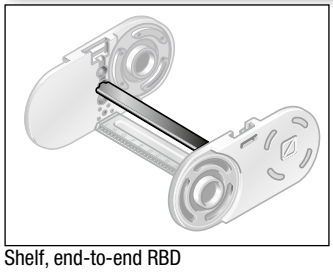


Separator, open

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	Version	Pitch mm	TI mm	H mm	H1 mm	H2 mm	H3 mm	HI mm
TR 25-0	025100009300	Separator, closed	lockable	2.5	8.0					25.0
TR 25-1	025100009400	Separator, open	lockable	2.5	8.0	3.3	7.0	12.5	18.0	25.0
TRT 25	025100009200	Separator, divisible	lockable	2.5	8.0		7.0	12.5	18.0	25.0
RTT 25	025100006500	Shelf support, divisible	lockable	2.5	8.0		7.0	12.5	0.0	25.0

Shelf

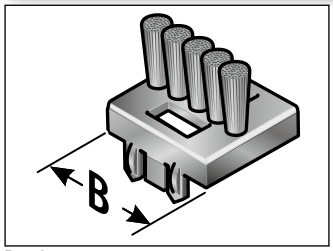


Shelf, end-to-end RBD

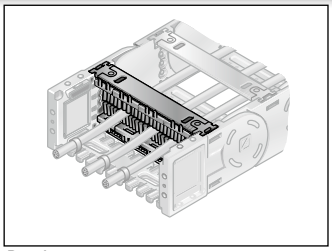
The shelf RBD creates a horizontal separation over the entire width of the chain link. When used together with the TRT 25 separator, an additional, vertical division can be realised.

Type	Order no.	Designation	Width mm	For internal width mm
RBD 040-3	030100004001	Shelf, end-to-end		40.0
RBD 050-3	030100005001	Shelf, end-to-end		50.0
RBD 060-3	030100006001	Shelf, end-to-end		60.0
RBD 075-3	030100007501	Shelf, end-to-end		75.0
RBD 085-3	030100008501	Shelf, end-to-end		85.0
RBD 100-3	030100010001	Shelf, end-to-end		100.0
RB 039-3	030100003900	Shelf	39.0	
RB 049-3	030100004900	Shelf	49.0	
RB 059-3	030100005900	Shelf	59.0	
RB 074-3	030100007400	Shelf	74.0	
RB 084-3	030100008400	Shelf	84.0	
RB 099-3	030100009900	Shelf	99.0	
RB 124-3	030100012400	Shelf	124.0	
RB 149-3	030100014900	Shelf	149.0	
RB 199-3	030100019900	Shelf	199.0	

Brush support



Brush support

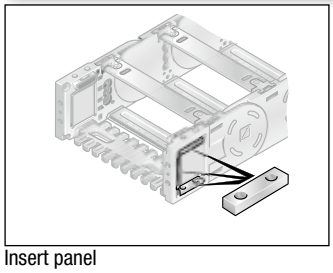


Brush support

The cables in the neutral strand are routed through the brush supports. This innovative solution was developed especially for applications where cables are subjected to higher levels of wear from cyclical movement.

Type	Order no.	Designation	Width mm
BT20-25	032500009702	Brush support	20.0
BT25-25	025100009802	Brush support	25.0

Insert panel

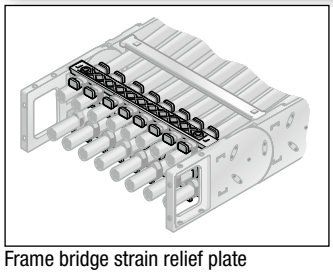


Insert panel

To fix the chain connection, the insert panels can be inserted above, below or on the side and are available with threads or through-holes.

Type	Order no.	Designation	Holes mm	Thread
EB 25/30-FG V2A	030100005502	Insert panel with thread		M5x1,5
EB 25/30-FB V2A	030100005500	Insert panel with through-hole	5.5	

Frame bridge strain relief plate

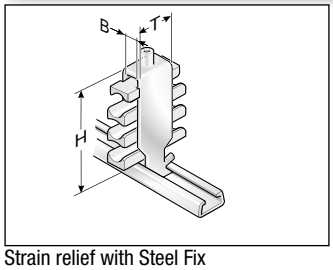


Frame bridge strain relief plate

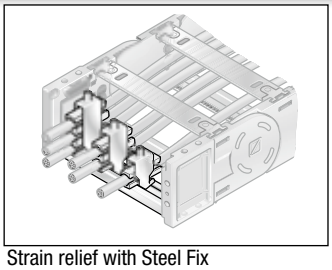
Fixed integrated frame bridge strain relief plates in the chain brackets. Tailored to all frame bridge widths up to 200 mm. May be assembled on the inside and outside bends at both chain endings.

Type	Order no.	Designation	For internal width mm
RS-ZL 040-3	030104000010	Frame bridge strain relief plate	40.0
RS-ZL 050-3	030105000010	Frame bridge strain relief plate	50.0
RS-ZL 060-3	030106000010	Frame bridge strain relief plate	60.0
RS-ZL 075-3	030107500010	Frame bridge strain relief plate	75.0
RS-ZL 085-3	030108500010	Frame bridge strain relief plate	85.0
RS-ZL 100-3	030110000010	Frame bridge strain relief plate	100.0
RS-ZL 125-3	030112500010	Frame bridge strain relief plate	125.0
RS-ZL 150-3	030115000010	Frame bridge strain relief plate	150.0
RS-ZL 200-3	030120000010	Frame bridge strain relief plate	200.0

Strain relief



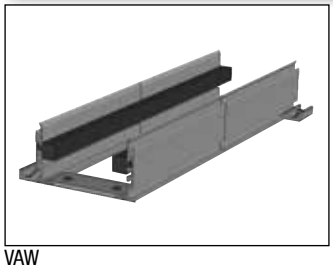
Strain relief with Steel Fix

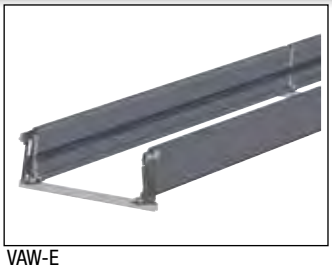

Strain relief with Steel Fix

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
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

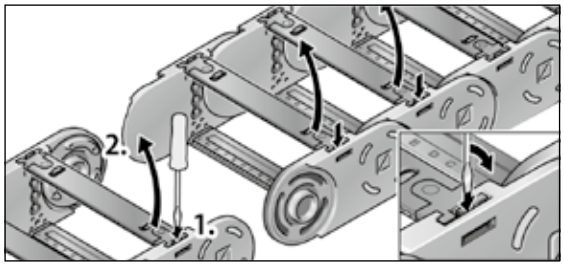
Guide channels (VAW)


VAW

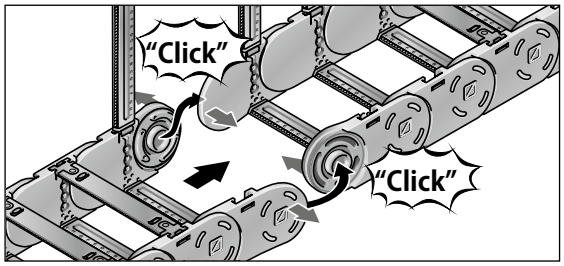

VAW-E

For this cable drag chain, a range of variable guide channel systems are available, constructed from aluminium or stainless steel 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“.

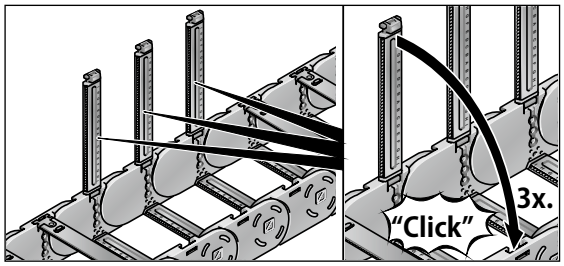
Assembly



Step 1

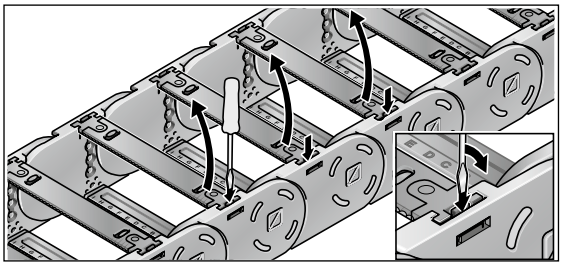


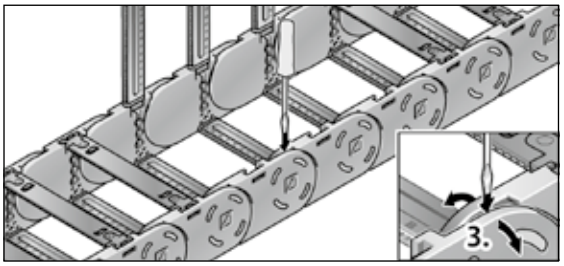
Step 2



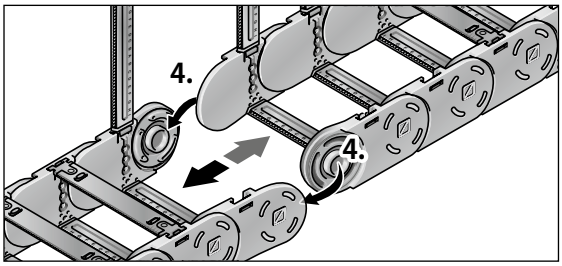
Step 3

Disassembly


Step 1



Step 2

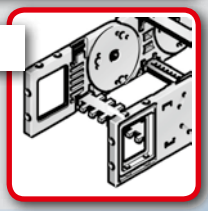


Step 3

System overview

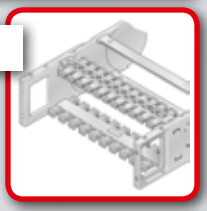
1 Chain bracket

Chain bracket flexible

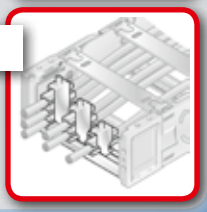


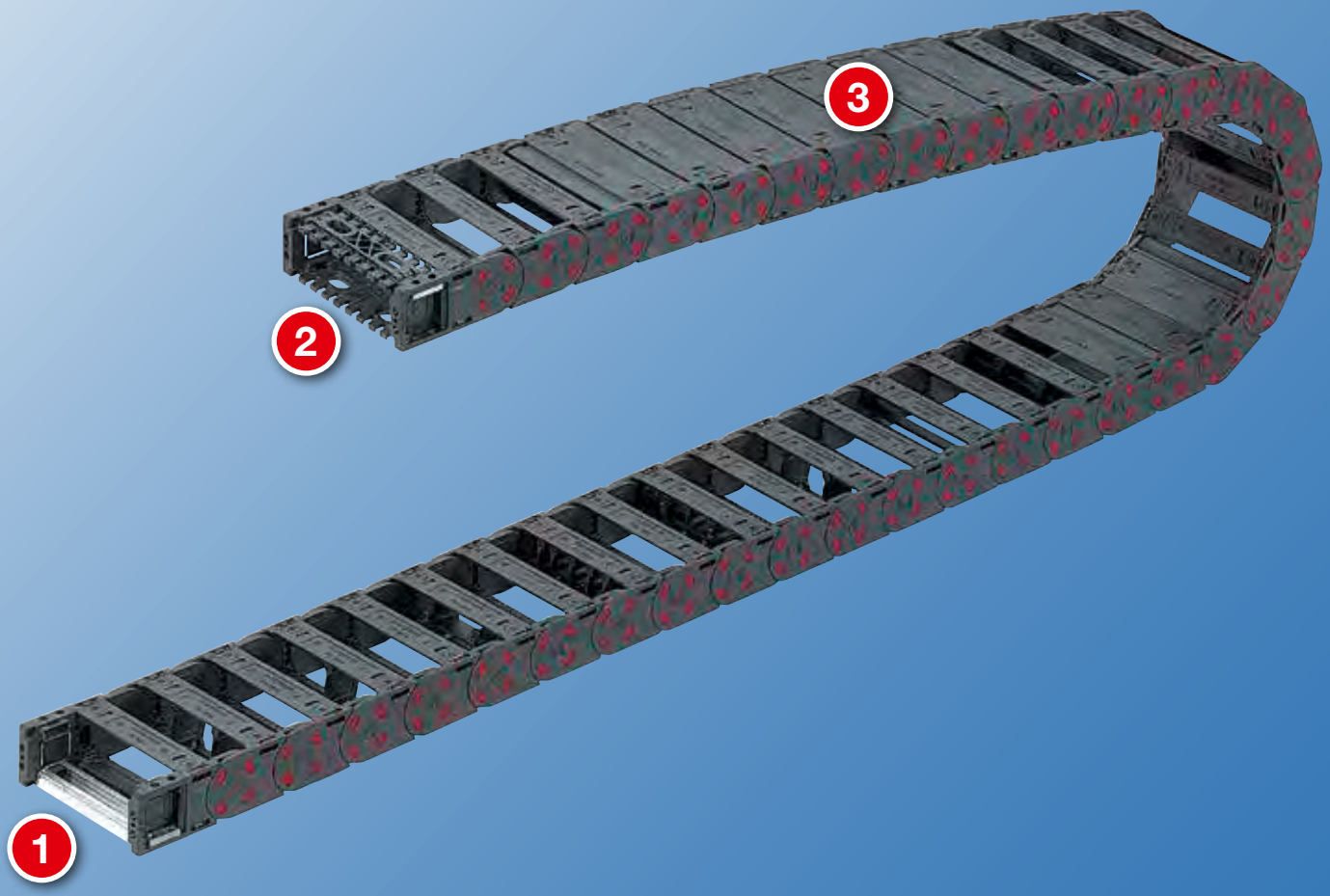
2 Strain relief

Frame bridge RS-ZL



STF Steel Fix





3 Shelving system

Separator TR

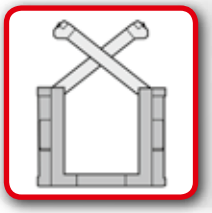
Shelf, end-to-end RBD

Guide channels

Aluminium VAW

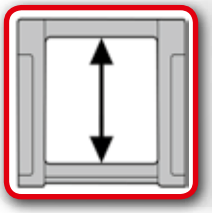
Stainless steel VAW-E

Technical data



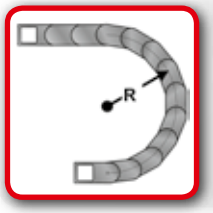
Loading side

Inside or outside flexure curve



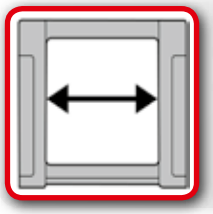
Available interior heights

30.0 mm



Available radii

60.0 – 300.0 mm



Available interior widths

40.0 – 200.0 mm

Ordering key

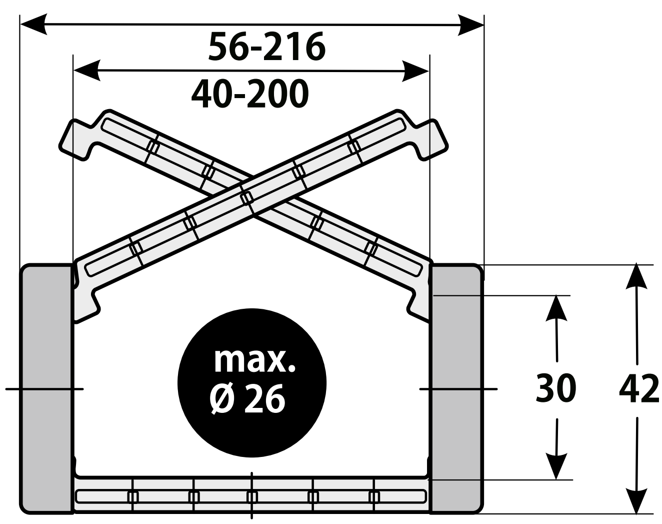
Type	Variation	Inside width mm	Outside width mm	Radius mm	Ridge version	Material	Chain length mm
		40	56				
	01	50	66	60[1]			
	02	60	76	75[1]			
	03	75	91	100			
	04	85	101	125			
	05	100	116	150			
	06	125	141	200			
	07	150	166	250	0	0	
0030	08	200	216	300	1	9	

1) for Variant 30 only

Ordering key _ _ _ _   _ _   _ _ _   _ _ _   _   _   _ _ _ _ _ _

Chain link

Loading side: Inside or outside flexure curve



Dimensions in mm

0	Standard (PA/black)
9	Special version

0	PA full-ridged with bias
1	PA full-ridged without bias

01	Frame bridge on outside of radius Frame bridge on inside of radius Opens on outside of radius
02	Frame bridge on outside of radius Frame bridge on inside of radius Opens on inside of radius
03	Cover on outside of radius Cover on inside of radius Opens on outside of radius
04	Cover on outside of radius Cover on inside of radius Opens on inside of radius
05	Cover on outside of radius Frame bridge on inside of radius Opens on outside of radius
06	Cover on outside of radius Frame bridge on inside of radius Opens on inside of radius
07	Frame bridge on outside of radius Cover on inside of radius Opens on outside of radius
08	Frame bridge on outside of radius Cover on inside of radius Opens on inside of radius

Order sample: 0030 01 040 060 0 0 1250
Frame bridge in outside bend, frame bridge in inside bend, can be opened from outside bend
Inside width 40 mm; radius 60 mm
Plastic bridge, full-ridged with bias, material black-coloured polyamide
Chain length 1250 mm (25 links)

Technical specifications

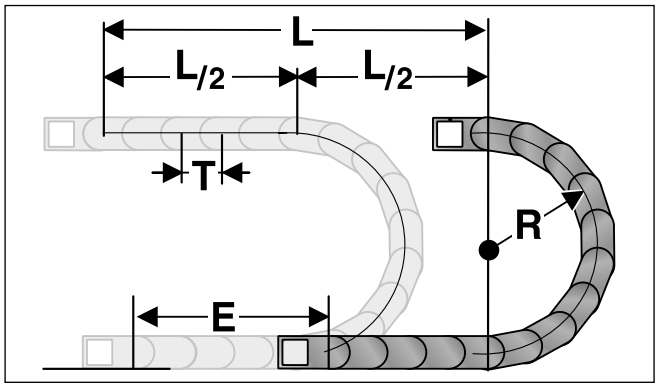
Travel distance gliding L_g max.:	40.0 m
Travel distance self-supporting L_f max.:	see diagram
Travel distance vertical, hanging L_{vh} max.:	30.0 m
Travel distance vertical, upright L_{vs} max.:	3.0 m
Rotated 90°, unsupported L_{90f} max.:	0.7 m
Speed, gliding V_g max.:	3.0 m/s
Speed, self-supporting V_f max.:	10.0 m/s
Acceleration, gliding a_g max.:	10.0 m/s²
Acceleration, self-supporting a_f max.:	15.0 m/s²

Material properties

Standard material:	Polyamide (PA) black
Service temperature:	-20.0 – 100.0 °C
Gliding friction factor:	0.3
Static friction factor:	0.45
Fire classification:	UL 94 HB

Other material properties on request.

Determining the chain length

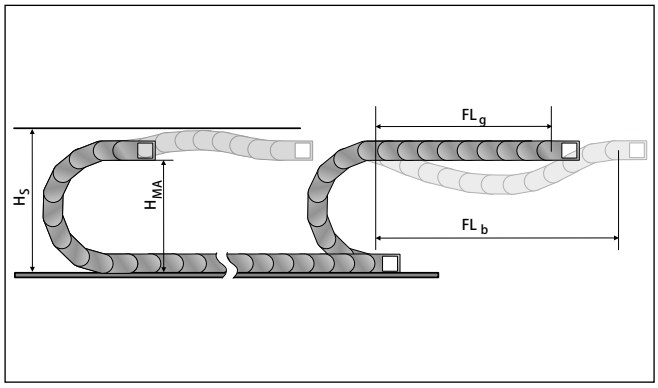


The fixed point of the cable drag chain should be connected in the middle of the travel distance.
This arrangement gives the shortest connection between the fixed point and the moving consumer and thus the most efficient chain length.

Chain length calculation = L/2 + π * R + E
≈ 1 m chain = 20 qty. x 50.0 mm links.

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

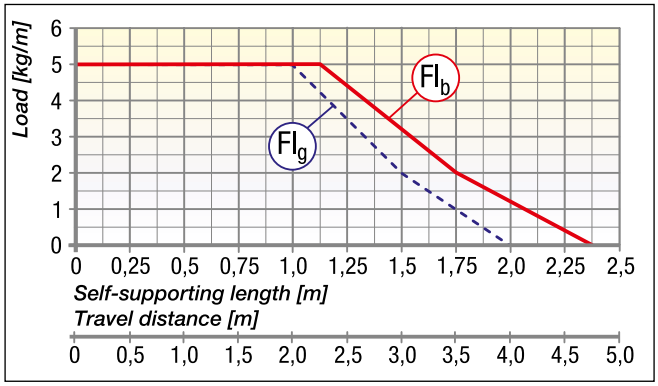
Self-supporting length



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

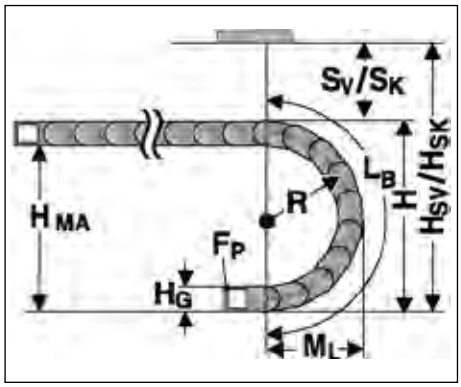
Load diagram for self-supporting applications



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

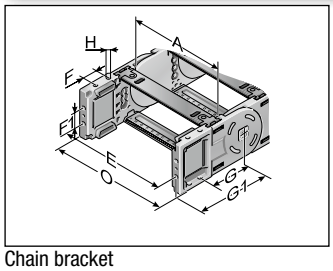
FL_b Self-supporting Length, upper run bent
In the FL_b range, the chain upper run has a sag of more than , but this is still less than the maximum sag.
Where the sag is greater than that permitted in the FL_b range, the application is critical and should be avoided. The self-supporting length can be optimized by using a support for the upper run or a more stable cable drag chain.
Closed cable drag chains (with covers) have a higher unit weight than open chains (with frame bridges). This higher weight must be taken into account when calculating the self-supporting length. To the weight of the cabling (cable load, in kg/m), you must add 0.3 kg/m, to account for the higher weight of closed-cover chains.

Installation dimensions



Radius R	60	75	100	125	150	200	250	300
Outside height of chain link (H_G)	42	42	42	42	42	42	42	42
Height of bend (H)	182	212	262	312	362	462	562	662
Height of moving end connection (H_{MA})	140	170	220	270	320	420	520	620
Safety margin with bias (S_V)	38	38	38	38	38	38	38	38
Installation height with bias (H_{SV})	220	250	300	350	400	500	600	700
Safety margin without bias (S_K)	18	18	18	18	18	18	18	18
Installation height without bias (H_{SK})	200	230	280	330	380	480	580	680
Arc projection (M_L)	141	156	181	206	231	281	331	381
Bend length (L_B)	336	383	461	540	618	775	932	1089

Chain bracket flexible



Chain bracket

This chain bracket offers universal connection options (top, bottom and front) and is attached to the ends of the chain like a side link. This allows the chain to move right up to the bracket. Each chain requires one male and one female bracket. M5 screws and insert panels are used to secure the brackets in place.
By default, the chain bracket is supplied with frame bridges.
The chain connection can then be optionally fitted with frame bridge strain relief RS-ZL or with strain relief using C-rails and bow clamps type STF.

Type	Order no.	Material	Inside width A mm	E mm	F mm	F1 mm	G mm	G1 mm	H	HØ mm	Outside width KA O mm
KA30	KA30ML	Plastic	40.0 – 200.0	A+9.0	12.0	12.0	45.0	72.0	M5	5.5	A+18.0

Configurator chain bracket KA 30
Configurator for chain brackets:

Type KA	Inside width	Radius	No. of RS-ZL	C-Profile No.	EB** No.
	mm	mm	Pieces	Pieces	Pieces
KA 30*	085	250	2	0	2

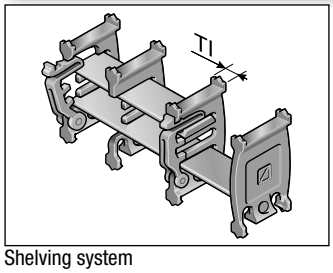
Order sample:

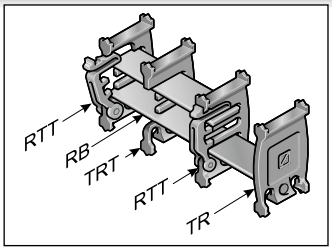
Type	= KA 30 = Chain bracket, flexible, for MP 30
Inner width	= 085 mm
Radius	= 250 mm
Frame bridge strain relief plate (RS-ZL)	= 2 pieces
C-section	= 0 pieces
Insert panel (EB)	= 2 pieces

* One set chain bracket is needed per chain, containing male and female end
** Two insert panels (EB) are needed per connection element

Note:
For an exact determination of the chain bracket, the inside width and radius are absolutely essential. Optionally frame bridge strain relief plates (RS-ZL), C-profiles and insert panels (EB) can be chosen.

Shelving system



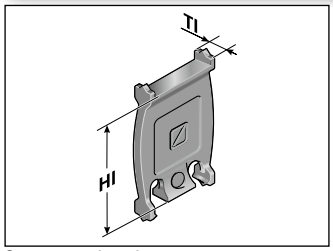


Shelving system

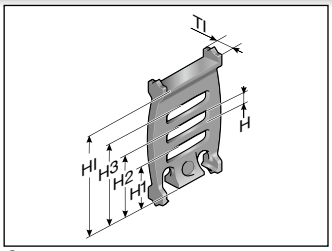
In connection with at least two separable shelf supports RTT or separable separators TRT the shelf becomes a shelving system that can be placed anywhere in the chain link. The shelf RBD creates a horizontal separation over the entire width of the chain link. If necessary the separator TRT can also be built in. The additional levels prevent cables from criss-crossing. Pre-assembly is not necessary as the shelving system and cabling can be assembled quickly and easily on site.

Type	Order no.	Designation	Pitch mm
TRT 25	025100009200	Separator, divisible	2.5
RTT 25	025100006500	Shelf support, divisible	2.5

Separator



Separator, closed

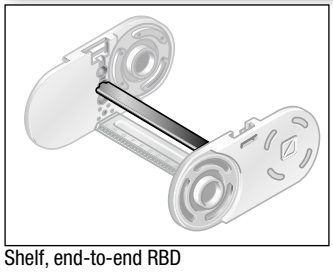


Separator, open

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	Version	Pitch mm	TI mm	H mm	H1 mm	H2 mm	H3 mm	HI mm
TR 30-0	030100009300	Separator, closed	lockable	2.5	2.2	3.3	11.0	16.5	22.0	36.0
TR 30-1	030100009400	Separator, open	lockable	2.5	2.2	3.3	11.0	16.5	22.0	30.0
TRT 30	030100009200	Separator, divisible	lockable	2.5	2.2	3.3	11.0	16.5	22.0	
RTT 30	030100006500	Shelf support, divisible	lockable	2.5	2.2	3.3	11.0	16.5	22.0	

Shelf

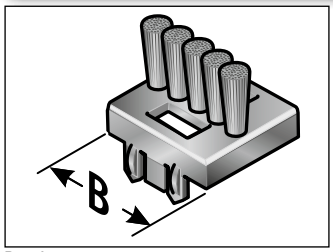


Shelf, end-to-end RBD

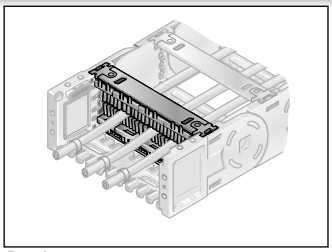
The shelf RBD creates a horizontal separation over the entire width of the chain link. When used together with the TRT 25 separator, an additional, vertical division can be realised.

Type	Order no.	Designation	Width mm	For internal width mm
RBD 040-3	030100004001	Shelf, end-to-end		40.0
RBD 050-3	030100005001	Shelf, end-to-end		50.0
RBD 060-3	030100006001	Shelf, end-to-end		60.0
RBD 075-3	030100007501	Shelf, end-to-end		75.0
RBD 085-3	030100008501	Shelf, end-to-end		85.0
RBD 100-3	030100010001	Shelf, end-to-end		100.0
RB 039-3	030100003900	Shelf	39.0	
RB 049-3	030100004900	Shelf	49.0	
RB 059-3	030100005900	Shelf	59.0	
RB 074-3	030100007400	Shelf	74.0	
RB 084-3	030100008400	Shelf	84.0	
RB 099-3	030100009900	Shelf	99.0	
RB 124-3	030100012400	Shelf	124.0	
RB 149-3	030100014900	Shelf	149.0	
RB 199-3	030100019900	Shelf	199.0	

Brush support



Brush support

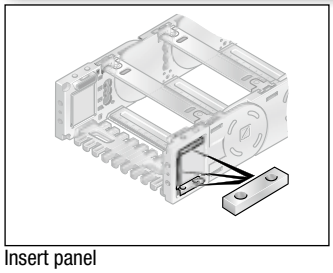


Brush support

The cables in the neutral strand are routed through the brush supports. This innovative solution was developed especially for applications where cables are subjected to higher levels of wear from cyclical movement.

Type	Order no.	Designation	Width mm
BT20-30	030100009702	Brush support	20.0
BT25-30	030100009802	Brush support	25.0

Insert panel

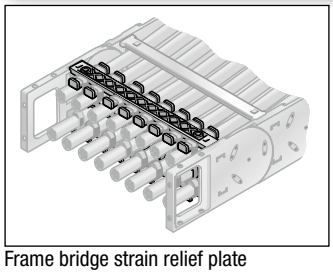


Insert panel

To fix the chain connection, the insert panels can be inserted above, below or on the side and are available with threads or through-holes.

Type	Order no.	Designation	Holes mm	Thread
EB 25/30-FG V2A	030100005502	Insert panel with thread		M5x1,5
EB 25/30-FB V2A	030100005500	Insert panel with through-hole	5.5	

Frame bridge strain relief plate

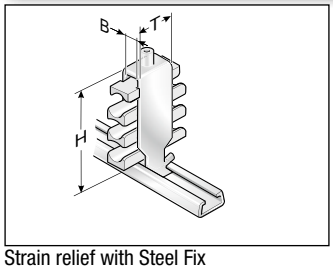


Frame bridge strain relief plate

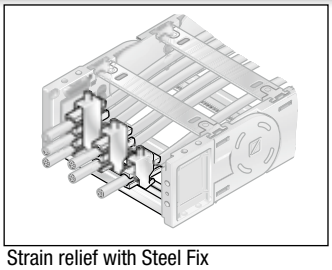
Fixed integrated frame bridge strain relief plates in the chain brackets. Tailored to all frame bridge widths up to 200 mm. May be assembled on the inside and outside bends at both chain endings.

Type	Order no.	Designation	For internal width mm
RS-ZL 040-3	030104000010	Frame bridge strain relief plate	40.0
RS-ZL 050-3	030105000010	Frame bridge strain relief plate	50.0
RS-ZL 060-3	030106000010	Frame bridge strain relief plate	60.0
RS-ZL 075-3	030107500010	Frame bridge strain relief plate	75.0
RS-ZL 085-3	030108500010	Frame bridge strain relief plate	85.0
RS-ZL 100-3	030110000010	Frame bridge strain relief plate	100.0
RS-ZL 125-3	030112500010	Frame bridge strain relief plate	125.0
RS-ZL 150-3	030115000010	Frame bridge strain relief plate	150.0
RS-ZL 200-3	030120000010	Frame bridge strain relief plate	200.0

Strain relief



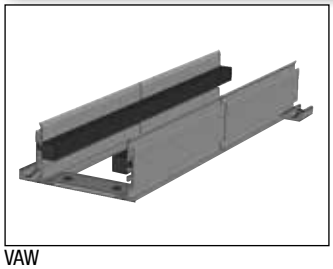
Strain relief with Steel Fix


Strain relief with Steel Fix

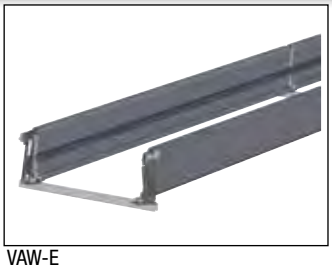
C-rails (cathodic dipped) for permanent integration, for accommodating the Steel Fix bow clamps in the chain brackets. The bow clamps can take up to 3 cables and are suitable for C-rails with a groove width of 11 mm. Due to the design of the trough elements a cable preserving cable guidance is ensured. 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
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

Guide channels (VAW)



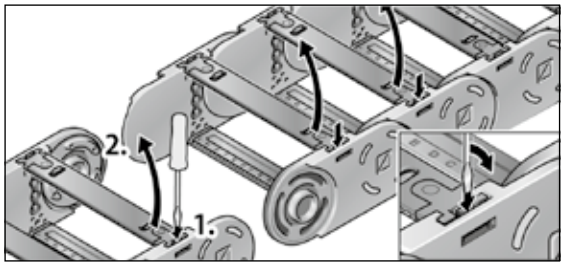
VAW



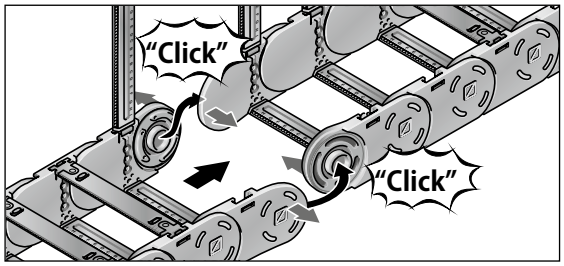
VAW-E

For this cable drag chain, a range of variable guide channel systems are available, constructed from aluminium or stainless steel 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“.

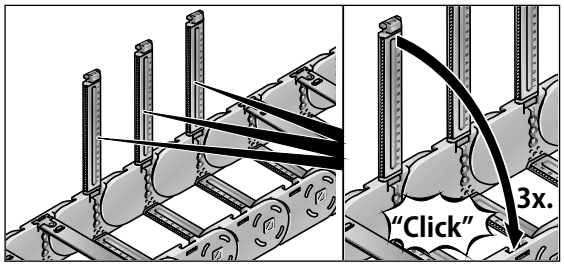
Assembly



Step 1

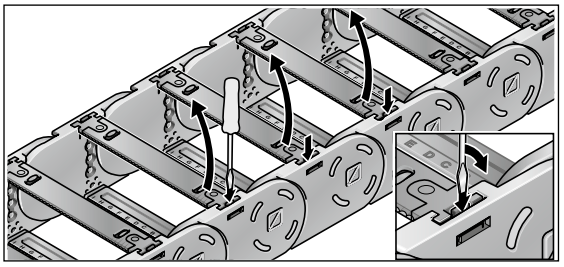


Step 2

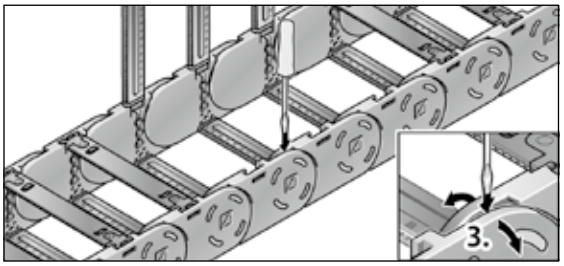


Step 3

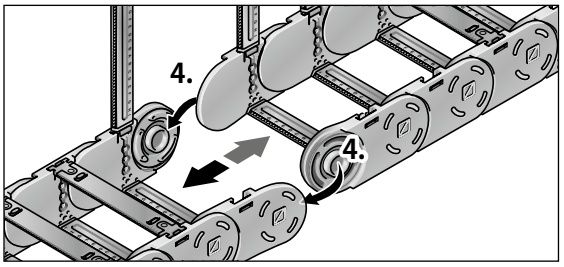
Disassembly



Step 1



Step 2

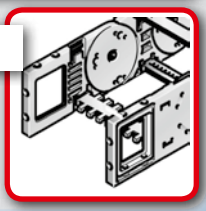


Step 3

System overview

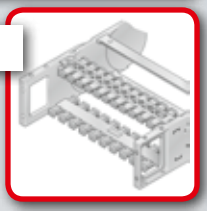
1 Chain bracket

Chain bracket flexible

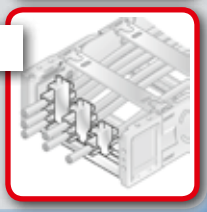


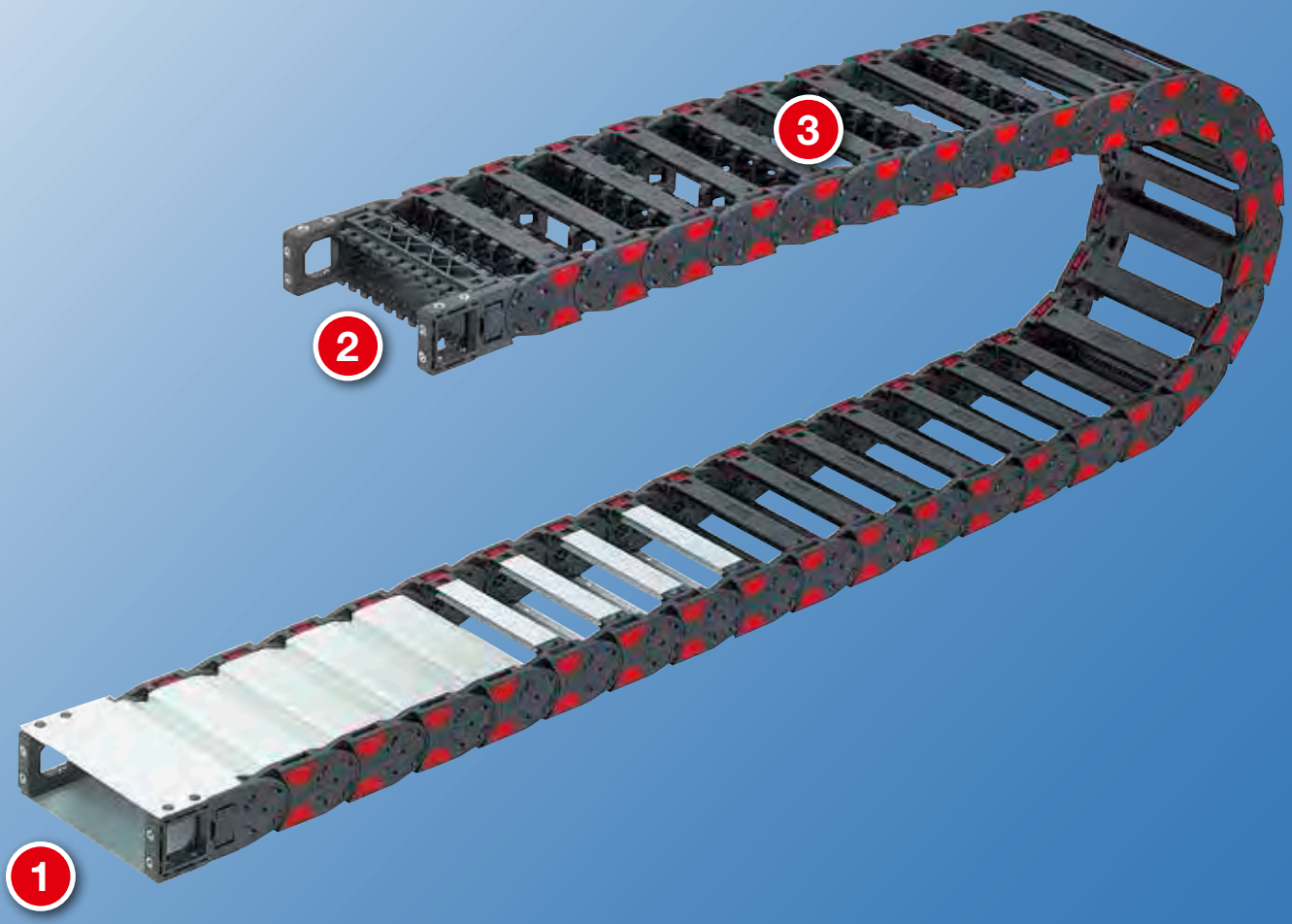
2 Strain relief

Frame bridge RS-ZL



STF Steel Fix

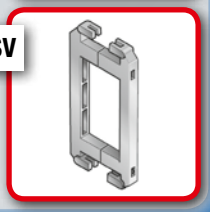




3 Shelving system

Separator TR

Frame bridge connector RSV

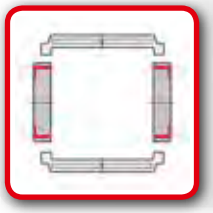


Guide channels

Aluminium VAW

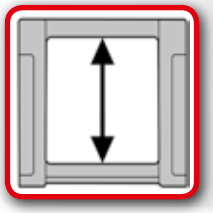
Stainless steel VAW-E

Technical data



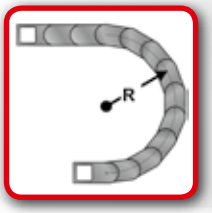
Loading side

inside and outside flexure curve



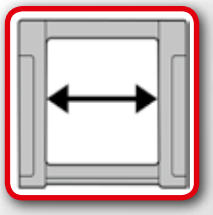
Available interior heights

32.0 mm



Available radii

80.0 – 250.0 mm



Available interior widths

45.0 – 546.0 mm

With aluminium frame bridge
80.0 – 600.0 mm

Ordering key

Type	Variation	Inside width mm	Outside width mm	Radius mm	Ridge version	Material
		45[1]	71[1]			
		62[1]	88[1]			
		71	97			
		84	110			
		96	122			
		107	133			
		121	147			
		133	159			
		144	170			
		146	172			
		158	184			
		171	197			
		182	208			
		196	222			
		220	246			
		246	272			
		296	322			
		346	372	80[1]		
		396[1]	422[1]	100[1]	0[1]	
		421[1]	447[1]	120	2[1]	0
		446[1]	472[1]	150	4	5[1]
0322	30	496[1]	522[1]	200	6[1]	7[1]
0323	44[2]	546[1]	572[1]	250	9[1]	9

Chain length mm

[1] for variant 30 only
[2] reduced inner height, reduced max. cable diameter, see chain link drawing (values in brackets)

Ordering key

Note on configuration

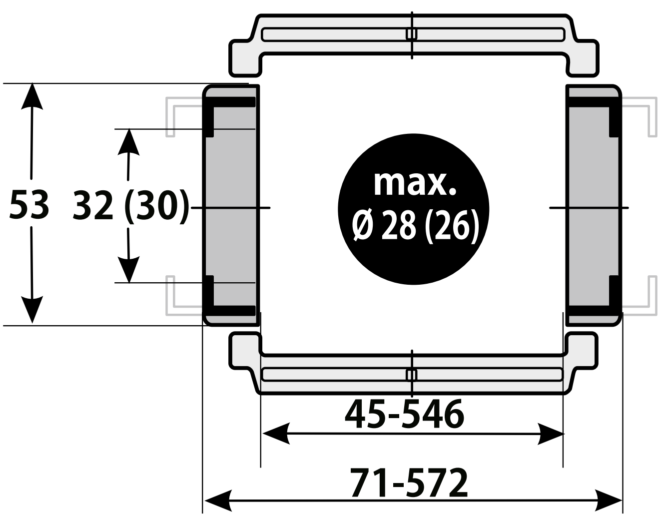
Frame bridges and cover from aluminium:
Aluminium frame bridges and covers can be supplied in 1 mm width sizes for inner widths from 80.0 mm – 600.0 mm.
If frame bridge strain relief plates (RS-ZL) are to be deployed, take standard widths into account.

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)
5 Polypropylene (PP/blue)
7 ESD (PA/light grey)
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
44 Cover on outside of radius
Cover on inside of radius
Opens on inside and outside of radius

Order sample: 0322 30 045 080 0 0 1290
Frame bridge in outside bend, frame bridge in inside bend, can be opened from inside and outside bend
Inside width 045 mm; radius 80 mm
Plastic bridge, full-ridged with bias, material black-coloured polyamide
Chain length 1290 mm (20 links)

Technical specifications

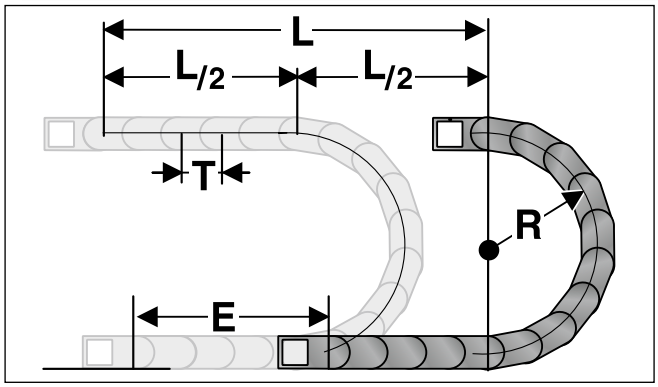
Travel distance gliding L_g max.:	100.0 m
Travel distance self-supporting L_f max.:	see diagram
Travel distance vertical, hanging L_{vh} max.:	40.0 m
Travel distance vertical, upright L_{vs} max.:	5.0 m
Rotated 90°, unsupported L_{90f} max.:	1.0 m
Speed, gliding V_g max.:	5.0 m/s
Speed, self-supporting V_f max.:	20.0 m/s
Acceleration, gliding a_g max.:	25.0 m/s²
Acceleration, self-supporting a_f max.:	30.0 m/s²

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:	UL 94 HB

Other material properties on request.

Determining the chain length

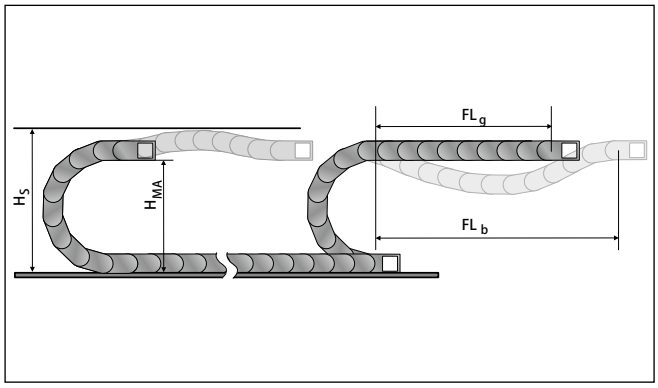


The fixed point of the cable drag chain should be connected in the middle of the travel distance.
This arrangement gives the shortest connection between the fixed point and the moving consumer and thus the most efficient chain length.

Chain length calculation = L/2 + π * R + E
≈ 1 m chain = 16 qty. x 64.5 mm links.

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

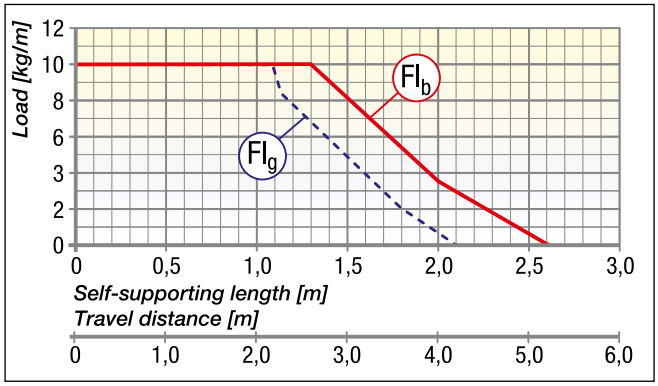
Self-supporting length



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

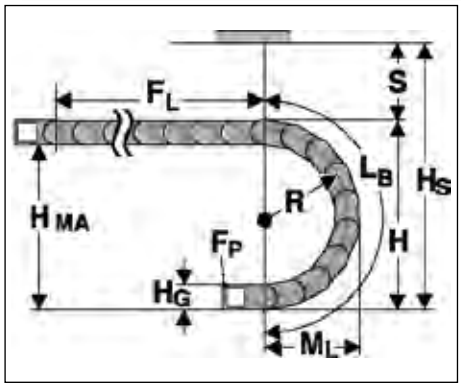
Load diagram for self-supporting applications



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

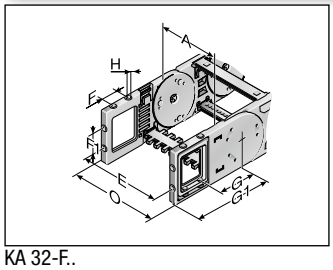
FL_b Self-supporting Length, upper run bent
In the FL_b range, the chain upper run has a sag of more than , but this is still less than the maximum sag.
Where the sag is greater than that permitted in the FL_b range, the application is critical and should be avoided. The self-supporting length can be optimized by using a support for the upper run or a more stable cable drag chain.
Closed cable drag chains (with covers) have a higher unit weight than open chains (with frame bridges). This higher weight must be taken into account when calculating the self-supporting length. To the weight of the cabling (cable load, in kg/m), you must add 1.5 kg/m, to account for the higher weight of closed-cover chains.

Installation dimensions



Radius R	80	100	120	150	200	250
Outside height of chain link (H_G)	53	53	53	53	53	53
Height of bend (H)	233	273	313	373	473	573
Height of moving end connection (H_{MA})	180	220	260	320	420	520
Safety margin (S)	30	30	30	30	30	30
Installation height (H_S)	263	303	343	403	503	603
Arc projection (M_L)	181	201	221	251	301	351
Bend length (L_B)	430	493	556	650	807	964

Chain bracket flexible

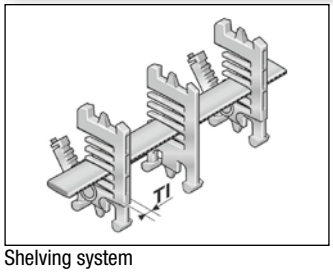


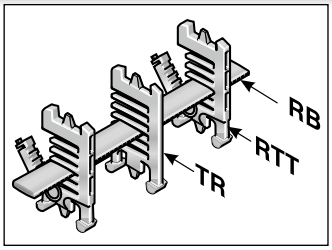
KA 32-F..

This chain bracket offers universal connection options (top, bottom and front) and is attached to the ends of the chain like a side link. This allows the chain to move right up to the bracket. Each chain requires one male and one female bracket. M5 screws are used to secure the brackets in place. Extrusion-coated metal bushes with either a through-hole (-FB) or a threaded hole (-FG) ensure the permanent, high-strength transmission of even extreme forces onto the cable drag chain.

Type	Order no.	Material	Version	Inside width A mm	E mm	F mm	F1 mm	G mm	G1 mm	H	HØ mm	Outside width KA O mm
KA 32-FB	0321000054	Plastic	with bush	45.0 – 546.0	A+14.0	22.5	22.0	57.8	95.5		5.5	A+28.0
KA 32-FG	0321000055	Plastic	with thread	45.0 – 546.0	A+14.0	22.5	22.0	57.8	95.5	M5		A+28.0

Shelving system



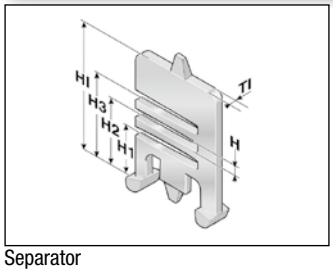


Shelving system

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. Pre-assembly is not necessary as the shelving system and cabling can be assembled quickly and easily on site.

Type	Order no.	Designation	Width mm	Pitch mm	TI mm
RB 028-5	100000002800	Shelf	28.0	5.6	
RB 056-5	100000005601	Shelf	56.0	5.6	
RB 084-5	100000008400	Shelf	84.0	5.6	
RB 112-5	100000011200	Shelf	112.0	5.6	
RB 140-5	100000014000	Shelf	140.0	5.6	
RB 168-5	100000016800	Shelf	168.0	5.6	
RB 196-5	100000019600	Shelf	196.0	5.6	
RTT 32	100090322000	Shelf support, divisible		5.6	7.0

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	TI mm	H mm	H1 mm	H2 mm	H3 mm	HI mm
TR 32.1	032200009200	Separator	5.6	3.5	4.0	8.5	14.5	20.5	32.1

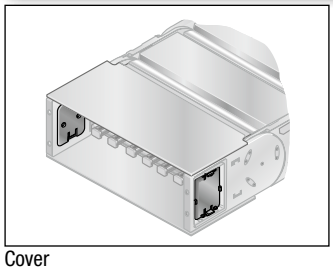
Bracket bar

Bracket bar

Large-diameter conduits are routed securely by using a bracket bar (BS). This bar is installed on the frame bridges or the covers of the cable drag chain.
The bracket bar can be installed on both the inside and outside bend.
The bracket bar support (BSH) is used to attach the bars to PowerLine series frame bridges. Two bracket bar supports are required for each bar.

Type	Order no.	Designation	Conduit diameter max. mm	Installation height (EH) mm	Inner chain width min. mm
BS 120-5	052412000000	Bracket bar	115.0	140.0	171.0
BS 153-5	052415300000	Bracket bar	148.0	170.0	220.0
BS 187-5	052418700000	Bracket bar	182.0	205.0	246.0
BSH-5	052400000000	Bracket bar support			

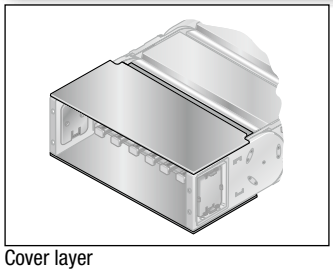
Cover chain bracket


Cover

Self-locking covers close the side mounting window on the flexible chain bracket (KA-FB/FG).

Type	Order no.
Cover D3 KA 32.1- FB/FG	0323888002

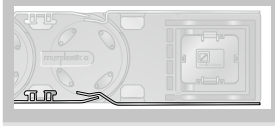
Cover chain bracket



Cover layer

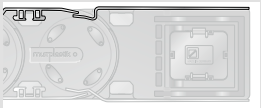
Constructed from aluminium, the canopies for the flexible chain bracket (KA-FB/FG) ensure a continuously closed system for chains with covers.

Canopy for chain bracket, fixed point outside bend: Type and part number configurator



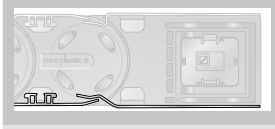
Type:	KA 32.1 FB/FG AB	Inside width	2-2
Order no.:	0321	Inside width	060

Cover for chain bracket fixed point inside bend: Type and part number configurator



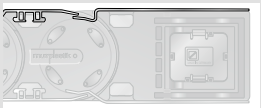
Type:	KA 32.1 FB/FG IB	Inside width	2-2
Order no.:	0321	Inside width	058

Cover for chain bracket moving end outside bend: Type and part number configurator



Type:	KA 32.1 FB/FG AB	Inside width	1-2
Order no.:	0321	Inside width	059

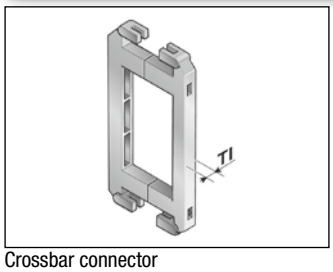
Cover for chain bracket moving end inside bend: Type and part number configurator



Type:	KA 32.1 FB/FG IB	Inside width	1-2
Order no.:	0321	Inside width	057

Sample order:
0321096058 KA 32.1 FB/FG IB 096 2-2
Chain bracket cover at fixing point in inner bend, for inner width of 96 mm.

Crossbar connector

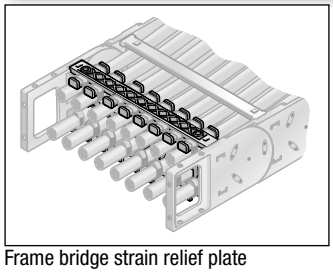


Crossbar connector

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	TI mm
RSV 32	032000009600	Crossbar connector	7.5
RSV 32 Alu	032000009800	Crossbar connector for aluminium frame bridges	7.5

Frame bridge strain relief plate

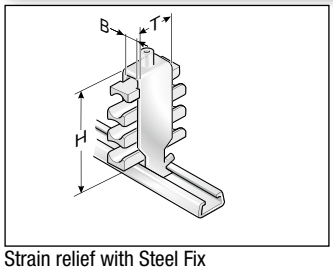


Frame bridge strain relief plate

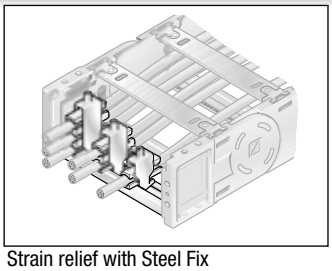
Fixed integrated frame bridge strain relief plates in the chain brackets. Tailored to all frame bridge widths up to 246 mm. May be assembled on the inside and outside bends at both chain endings.

Type	Order no.	Designation	Note	For internal width mm
RS-ZL 045-5	052004500010	Frame bridge strain relief plate		45.0
RS-ZL 062-5	052006200010	Frame bridge strain relief plate		62.0
RS-ZL 071-5	052007100010	Frame bridge strain relief plate		71.0
RS-ZL 084-5	052008400010	Frame bridge strain relief plate		84.0
RS-ZL 096-5	052009600010	Frame bridge strain relief plate		96.0
RS-ZL 107-5	052010700010	Frame bridge strain relief plate		107.0
RS-ZL 121-5	052012100010	Frame bridge strain relief plate		121.0
RS-ZL 133-5	052013300010	Frame bridge strain relief plate		133.0
RS-ZL 144/146-5	052014400010	Frame bridge strain relief plate	also for internal width 146 mm	144.0
RS-ZL 158-5	052015800010	Frame bridge strain relief plate		158.0
RS-ZL 171-5	052017100010	Frame bridge strain relief plate		171.0
RS-ZL 182-5	052018200010	Frame bridge strain relief plate		182.0
RS-ZL 196-5	052019600010	Frame bridge strain relief plate		196.0
RS-ZL 220-5	052022000010	Frame bridge strain relief plate		220.0
RS-ZL 246-5	052024600010	Frame bridge strain relief plate		246.0

Strain relief



Strain relief with Steel Fix



Strain relief with Steel Fix

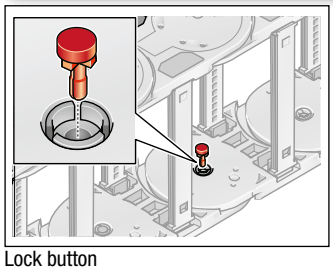
C-rails (cathodic dipped) for permanent integration, for accommodating the Steel Fix bow clamps in the chain brackets. The bow clamps can take up to 3 cables and are suitable for C-rails with a groove width of 11 mm. Due to the design of the trough elements a cable preserving cable guidance is ensured. 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.

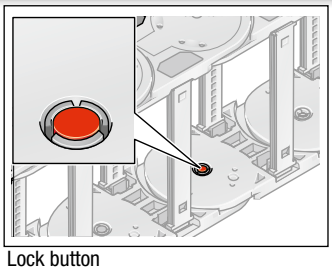
Type	Order no.	Designation	Ø mm	Seats qty.
Single clamp (for one cable)				
STF 12-1 Steel Fix	81661801	Hooped clamp	6.0 – 12.0	1
STF 14-1 Steel Fix	81661802	Hooped clamp	12.0 – 14.0	1
STF 16-1 Steel Fix	81661803	Hooped clamp	14.0 – 16.0	1
STF 18-1 Steel Fix	81661804	Hooped clamp	16.0 – 18.0	1
STF 20-1 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

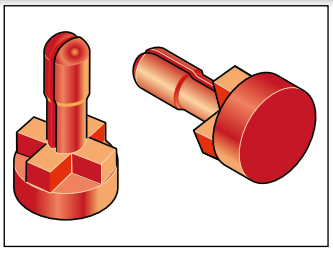
Strain relief (Continued...)

Type	Order no.	Designation	Ø mm	Seats qty.
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
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

Lock button


Lock button

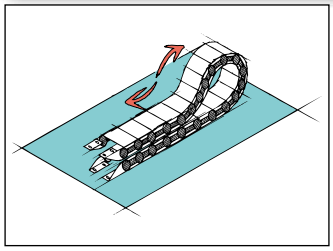

Lock button

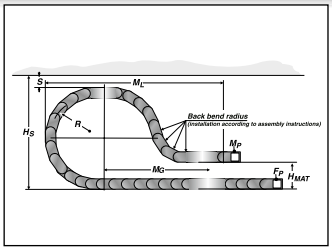


To increase the side stability, we recommend the use of lock buttons during strong lateral acceleration or when installed „laying on the side (turned 90°) without support“.

Type	Order no.
MP32/41 lock button	041000008000

Lowered fixing point





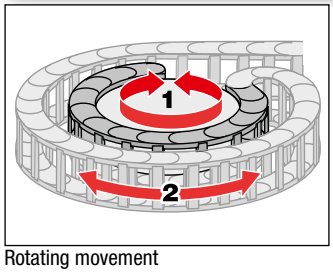
It is sometimes necessary to lower the height of the moving attachment point.

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

Please contact our application engineers.

Radius R mm	Height of moving end connection (H_{MAT}) mm	Safety margin (S) mm	Installation height incl. safety (H_S) mm	Projection (M_L) mm	Additional links qty.	of which additional back chain links qty.
200.0	210.0	50.0	523.0	720.0	14.0	3.0
250.0	230.0	50.0	623.0	880.0	17.0	3.0

Back radii

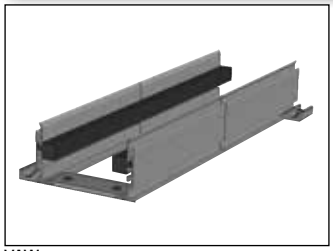


Rotating movement

Side links with radius forward (R) and radius backward (Rü) allow for movement in two directions. This is intended for rotating movements and lowered chain brackets.

Type	Order no.	Radius mm	Back radius mm
SR 32.2 RK080 (RÜ200/R120)	032200008060	120.0	200.0
SR 32.2 RK100 (RÜ200/R135)	032200010060	135.0	200.0
SR 32.2 RK120 (RÜ200/R150)	032200012060	150.0	200.0
SR 32.2 RK150 (RÜ200/R170)	032200015060	170.0	200.0
SR 32.2 RK200 (RÜ200/R200)	032200020060	200.0	200.0
SR 32.2 RK250 (RÜ200/R250)	032200025060	250.0	200.0

Guide channels (VAW)

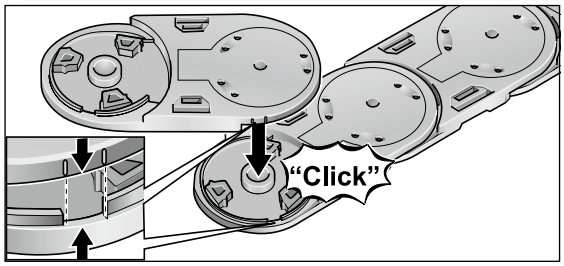


VAW

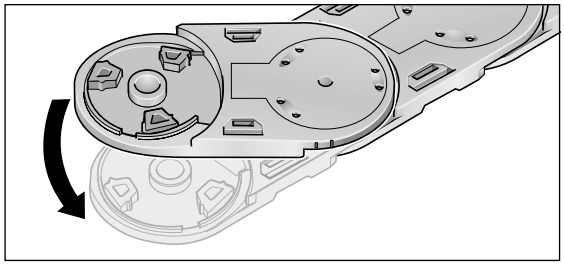
VAW-E

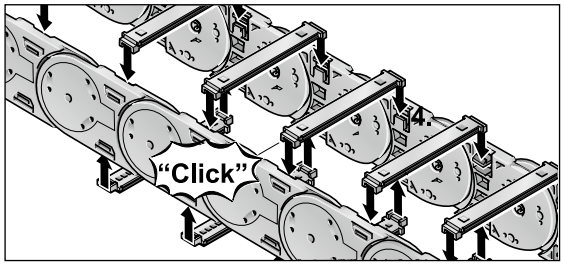
For this cable drag chain, a range of variable guide channel systems are available, constructed from aluminium or stainless steel sections.
The variable guide channel ensures that the cable drag chain is supported and guided securely.
For help on choosing, please consult the chapter „Variable Guide Channel System“.

Assembly

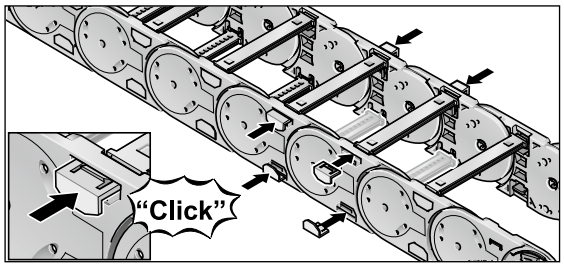


Step 1


Step 2

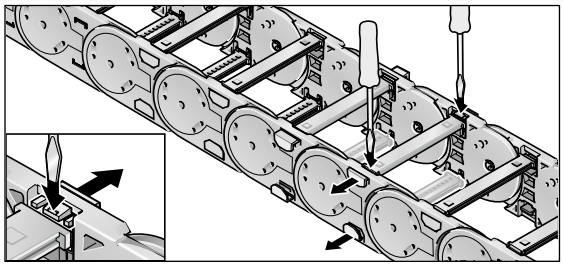


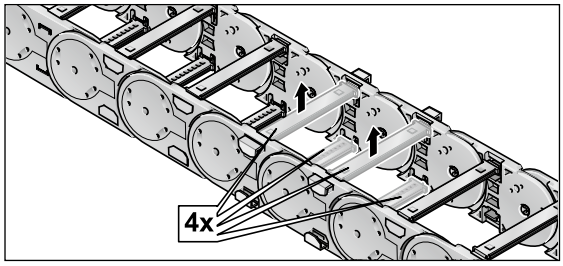
Step 3



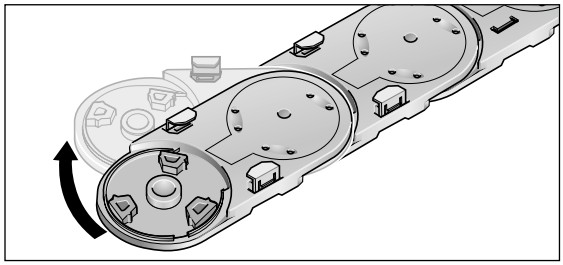
Step 4

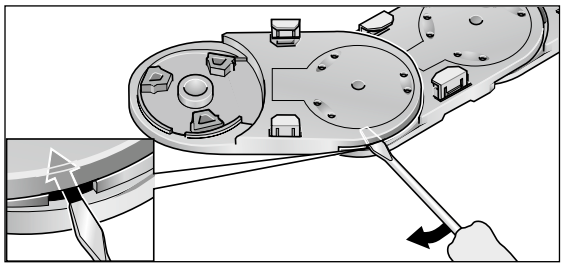
Disassembly


Step 1

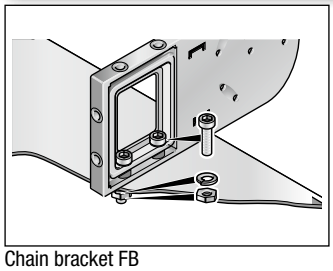


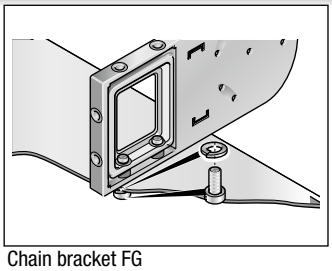
Step 2


Step 3


Step 4

Assembly instruction flexible chain bracket


Chain bracket FB


Chain bracket FG

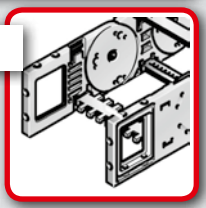
Brass bushes guarantee long-lasting fastening without cold flow in the plastic.

Version KA-FB:
Integrated through-hole fastened down using screw and nut.
Version KA-FG:
Built-in threads allow for quick and easy on-site mounting, since a screw, including a retaining washer where necessary, is sufficient.

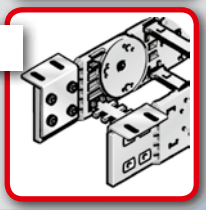
System overview

1 Chain bracket

Chain bracket flexible

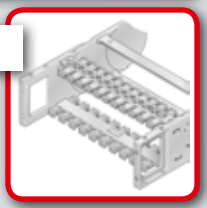


Chain bracket angle

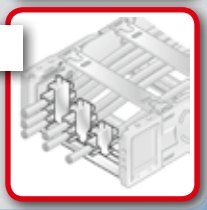


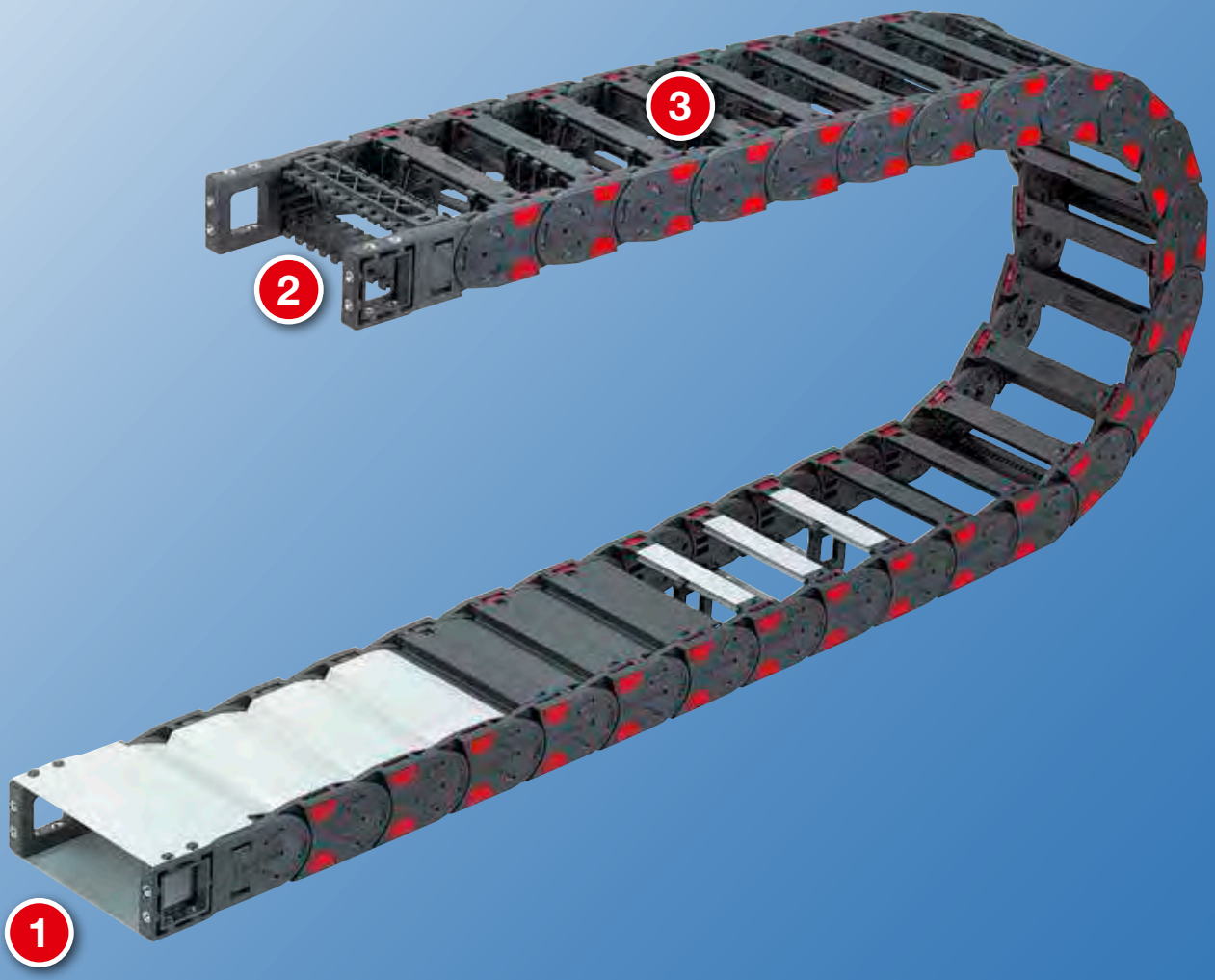
2 Strain relief

Frame bridge RS-ZL



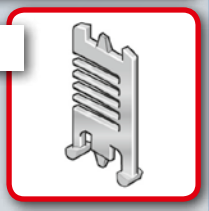
STF Steel Fix



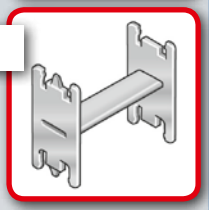


3 Shelving system

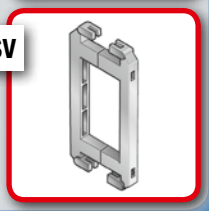
Separator TR



H-shaped shelf unit RE



Frame bridge connector RSV

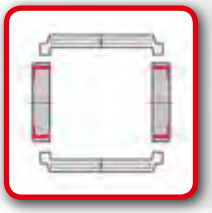


Guide channels

Aluminium VAW

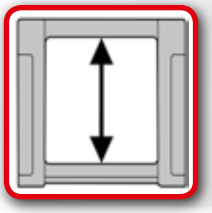
Stainless steel VAW-E

Technical data



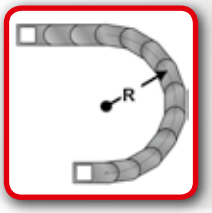
Loading side

inside and outside flexure curve



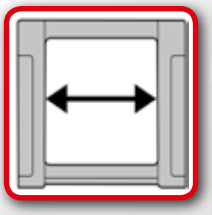
Available interior heights

42.0 mm



Available radii

90.0 – 350.0 mm



Available interior widths

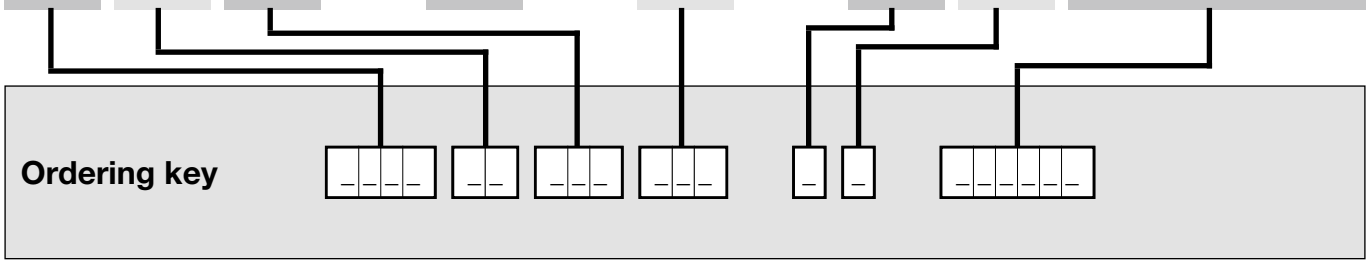
45.0 – 546.0 mm

With aluminium frame bridge
80.0 – 600.0 mm

Ordering key

Type	Variation						
		Inside width mm	Outside width mm	Radius mm	Ridge version	Material	Chain length mm
0412 0413	44[3] 30	45[1] 62[1] 71 84[2] 96[2] 107 121 133 144 146[2] 158 171 182 196[2] 220 246[2] 296[2] 346 396[1] 421[1] 446[1] 496[1] 546[1]	77[1] 94[1] 103 116 128 139 153 165 176 178 190 203 214 228 252 278 328 378 428[1] 453[1] 478 528[1] 578[1]	90[1] 120[1] 150 200 250 300 350	0 1 2[1] 3[1] 4 5 6[1] 7[1] 9[1]	0 5[1] 7[1] 9	

[1] for variant 30 only
[2] also available with plastic cover
[3] reduced inner height, reduced max. cable diameter, see chain link drawing (values in brackets)



Note on configuration

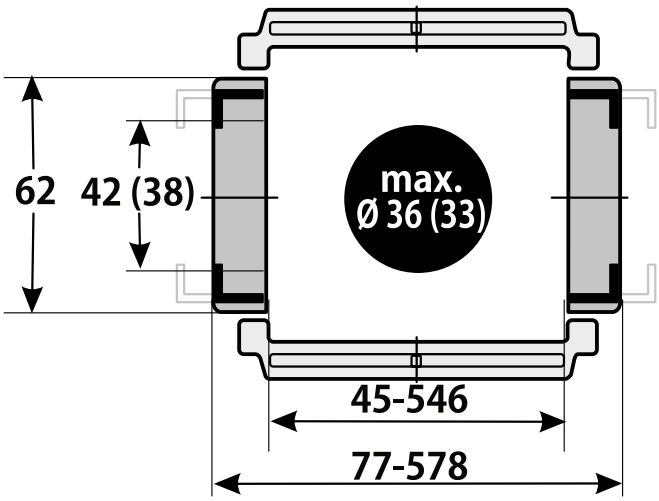
Frame bridges and cover from aluminium:
Aluminium frame bridges and covers can be supplied in 1 mm width sizes for inner widths from 80.0 mm – 600.0 mm.
If frame bridge strain relief plates (RS-ZL) are to be deployed, take standard widths into account.

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)
5 Polypropylene (PP/blue)
7 ESD (PA/light grey)
9 Special version

0 PA full-ridged with bias
1 PA full-ridged without bias
2 PA half-ridged with bias
3 PA half-ridged without bias
4 Aluminium full-ridged with bias
5 Aluminium full-ridged without bias
6 Aluminium half-ridged with bias
7 Aluminium half-ridged without bias
9 Special version

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

Order sample: 0412 30 045 090 0 0 1386
Frame bridge in outside bend, frame bridge in inside bend, can be opened from inside and outside bend
Inside width 45 mm; radius 90 mm
Plastic bridge, full-ridged with bias, material black-coloured polyamide
Chain length 1386 mm (18 links)

Technical specifications

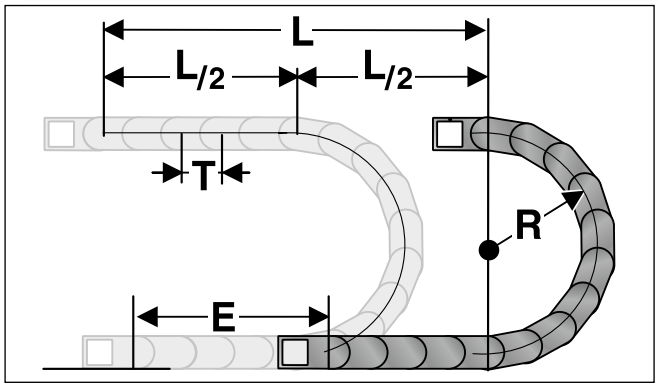
Travel distance gliding L_g max.:	120.0 m
Travel distance self-supporting L_f max.:	see diagram
Travel distance vertical, hanging L_{vh} max.:	50.0 m
Travel distance vertical, upright L_{vs} max.:	6.0 m
Rotated 90°, unsupported L_{90f} max.:	1.0 m
Speed, gliding V_g max.:	5.0 m/s
Speed, self-supporting V_f max.:	20.0 m/s
Acceleration, gliding a_g max.:	25.0 m/s²
Acceleration, self-supporting a_f max.:	30.0 m/s²

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:	UL 94 HB

Other material properties on request.

Determining the chain length

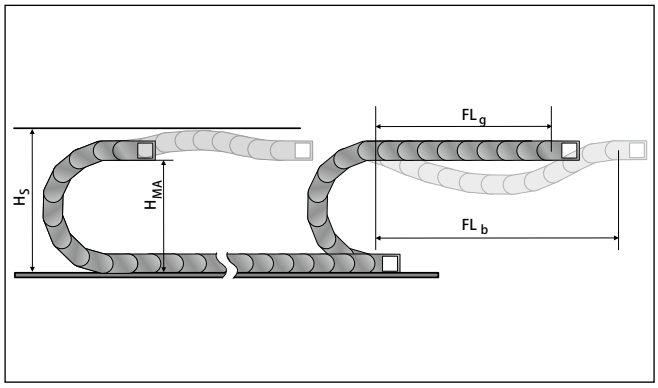


The fixed point of the cable drag chain should be connected in the middle of the travel distance.
This arrangement gives the shortest connection between the fixed point and the moving consumer and thus the most efficient chain length.

Chain length calculation = L/2 + π * R + E
≈ 1 m chain = 13 qty. x 77.0 mm links.

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

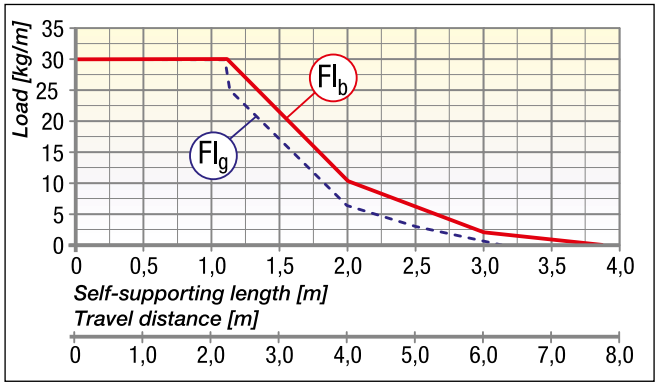
Self-supporting length



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

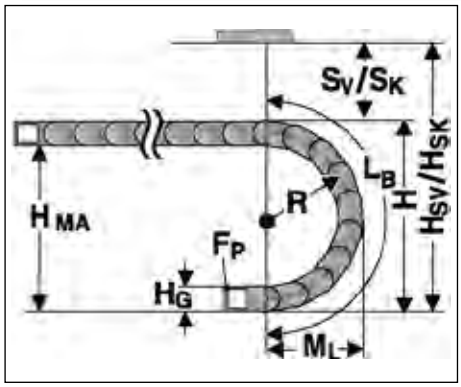
Load diagram for self-supporting applications



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

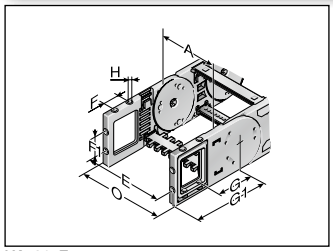
FL_b Self-supporting Length, upper run bent
In the FL_b range, the chain upper run has a sag of more than , but this is still less than the maximum sag.
Where the sag is greater than that permitted in the FL_b range, the application is critical and should be avoided. The self-supporting length can be optimized by using a support for the upper run or a more stable cable drag chain.
Closed cable drag chains (with covers) have a higher unit weight than open chains (with frame bridges). This higher weight must be taken into account when calculating the self-supporting length. To the weight of the cabling (cable load, in kg/m), you must add 1.5 kg/m, to account for the higher weight of closed-cover chains.

Installation dimensions



Radius R	90	120	150	200	250	300	350
Outside height of chain link (H_G)	62	62	62	62	62	62	62
Height of bend (H)	252	312	372	472	572	672	772
Height of moving end connection (H_{MA})	190	250	310	410	510	610	710
Safety margin with bias (S_V)	30	30	30	30	30	30	30
Installation height with bias (H_{SV})	282	342	402	502	602	702	802
Safety margin without bias (S_K)	15	15	15	15	15	15	15
Installation height without bias (H_{SK})	267	327	387	487	587	687	787
Arc projection (M_L)	203	233	263	313	363	413	463
Bend length (L_B)	473	567	661	818	975	1132	1289

Chain bracket flexible

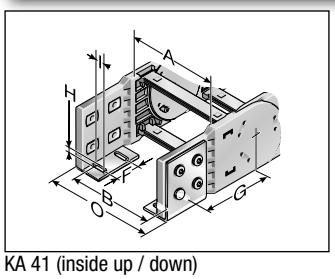


KA 41-F...

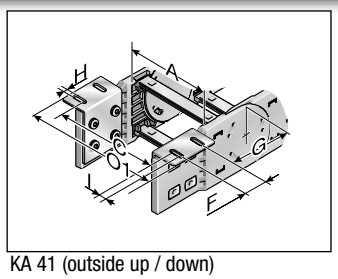
This chain bracket offers universal connection options (top, bottom and front) and is attached to the ends of the chain like a side link. This allows the chain to move right up to the bracket. Each chain requires one male and one female bracket. M6 screws are used to secure the brackets in place. Extrusion-coated metal bushes with either a through-hole (-FB) or a threaded hole (-FG) ensure the permanent, high-strength transmission of even extreme forces onto the cable drag chain.

Type	Order no.	Material	Version	Inside width A mm	E mm	F mm	F1 mm	G mm	G1 mm	H	HØ mm	Outside width KA O mm
KA 41-FB	0411000054	Plastic	with bush	45.0 – 546.0	A+20.0	22.5	22.0	79.0	120.0		6.5	A+34.0
KA 41-FG	0411000055	Plastic	with thread	45.0 – 546.0	A+20.0	22.5	22.0	79.0	120.0	M6		A+34.0

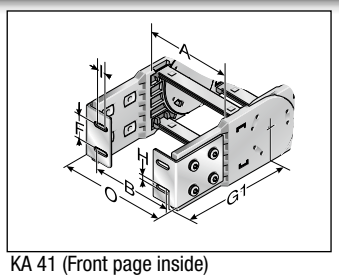
Chain bracket angle



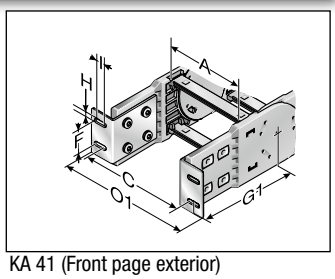
KA 41 (inside up / down)



KA 41 (outside up / down)



KA 41 (Front page inside)

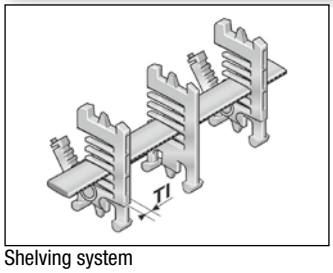


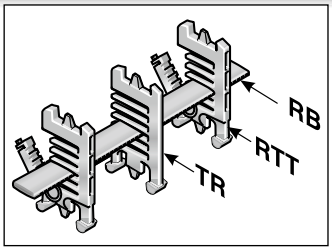
KA 41 (Front page exterior)

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 two chain brackets. The brackets should be fastened with M6 screws.

Type	Order no.	Material	Inside width A mm	B mm	C mm	F mm	G mm	G1 mm	HØ mm	Outside width KA O mm	Outside width KA O1 mm
KA 41	0410000051	Sheet steel	45.0 – 546.0	A-2.5	A+34.5	32.0	79.0	125.7	6.5	A+32.0	A+71.0

Shelving system



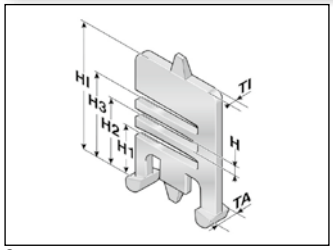


Shelving system

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. Pre-assembly is not necessary as the shelving system and cabling can be assembled quickly and easily on site.

Type	Order no.	Designation	Width mm	Pitch mm	TI mm
RB 028-5	100000002800	Shelf	28.0	5.6	
RB 056-5	100000005601	Shelf	56.0	5.6	
RB 084-5	100000008400	Shelf	84.0	5.6	
RB 112-5	100000011200	Shelf	112.0	5.6	
RB 140-5	100000014000	Shelf	140.0	5.6	
RB 168-5	100000016800	Shelf	168.0	5.6	
RB 196-5	100000019600	Shelf	196.0	5.6	
RTT 41	100090412000	Shelf support, divisible		5.6	7.0

Separator

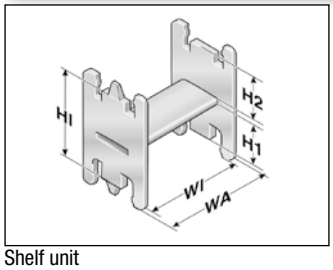


Separator

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.	Pitch mm	TI mm	H mm	H1 mm	H2 mm	H3 mm	HI mm
TR 41.1	041200009200	5.6	3.5	4.0	18.1	24.9	30.9	42.0

Shelf unit



Shelf unit

Insert to obtain additional levels in pre-defined window distances.

Type	Order no.	Designation	Pitch mm	WA mm	WI mm	H1 mm	H2 mm	HI mm
RE 36/11	100000361112	H-shaped shelf unit	5.6	42.5	36.5	26.2	11.5	42.0
RE 59/18	100000591812	H-shaped shelf unit	5.6	65.0	59.0	18.8	18.8	42.0
RE 81/11	100000811112	H-shaped shelf unit	5.6	87.5	81.5	26.2	11.5	42.0

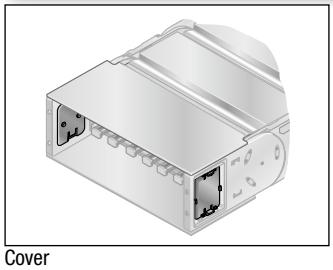
Bracket bar

Bracket bar

Large-diameter conduits are routed securely by using a bracket bar (BS). This bar is installed on the frame bridges or the covers of the cable drag chain.
The bracket bar can be installed on both the inside and outside bend.
The bracket bar support (BSH) is used to attach the bars to PowerLine series frame bridges. Two bracket bar supports are required for each bar.

Type	Order no.	Designation	Conduit diameter max. mm	Installation height (EH) mm	Inner chain width min. mm
BS 120-5	052412000000	Bracket bar	115.0	140.0	171.0
BS 153-5	052415300000	Bracket bar	148.0	170.0	220.0
BS 187-5	052418700000	Bracket bar	182.0	205.0	246.0
BSH-5	052400000000	Bracket bar support			

Cover chain bracket

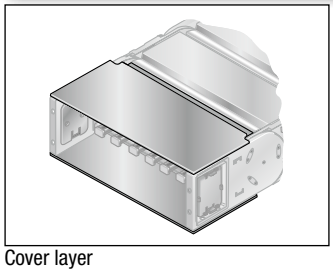


Cover

Self-locking covers close the side mounting window on the flexible chain bracket (KA-FB/FG).

Type	Order no.
Cover D4 KA 41.1-FB/FG	0413888002

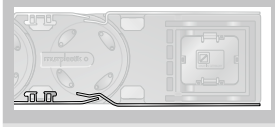
Cover chain bracket



Cover layer

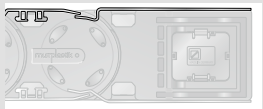
Constructed from aluminium, the canopies for the flexible chain bracket (KA-FB/FG) ensure a continuously closed system for chains with covers.

Canopy for chain bracket, fixed point outside bend: Type and part number configurator



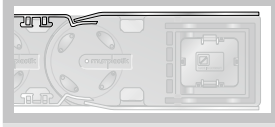
Type:	KA 41.1 FB/FG AB	Inside width	2-2
Order no.:	0411	Inside width	060

Cover for chain bracket fixed point inside bend: Type and part number configurator



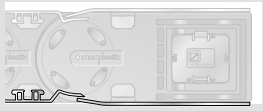
Type:	KA 41.1 FB/FG IB	Inside width	2-2
Order no.:	0411	Inside width	058

Cover for chain bracket moving end outside bend: Type and part number configurator



Type:	KA 41.1 FB/FG AB	Inside width	1-2
Order no.:	0411	Inside width	059

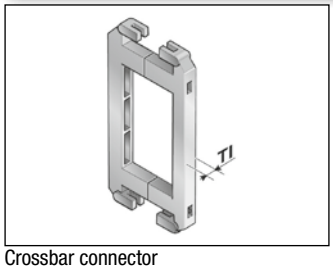
Cover for chain bracket moving end inside bend: Type and part number configurator



Type:	KA 41.1 FB/FG IB	Inside width	1-2
Order no.:	0411	Inside width	057

Sample order:
0411096058 KA 41.1 FB/FG IB 096 2-2
Chain bracket cover at fixing point in inner bend, for inner width of 96 mm.

Crossbar connector

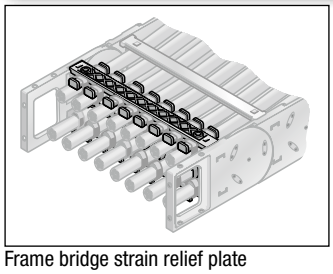


Crossbar connector

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	TI mm
RSV 41	041000009600	Crossbar connector	7.5
RSV 41 Alu	041000009800	Crossbar connector for aluminium frame bridges	7.5

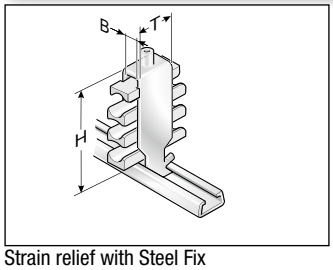
Frame bridge strain relief plate


Frame bridge strain relief plate

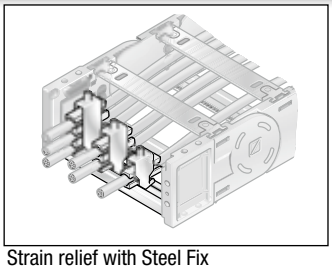
Fixed integrated frame bridge strain relief plates in the chain brackets. Tailored to all frame bridge widths up to 246 mm. May be assembled on the inside and outside bends at both chain endings.

Type	Order no.	Designation	Note	For internal width mm
RS-ZL 045-5	052004500010	Frame bridge strain relief plate		45.0
RS-ZL 062-5	052006200010	Frame bridge strain relief plate		62.0
RS-ZL 071-5	052007100010	Frame bridge strain relief plate		71.0
RS-ZL 084-5	052008400010	Frame bridge strain relief plate		84.0
RS-ZL 096-5	052009600010	Frame bridge strain relief plate		96.0
RS-ZL 107-5	052010700010	Frame bridge strain relief plate		107.0
RS-ZL 121-5	052012100010	Frame bridge strain relief plate		121.0
RS-ZL 133-5	052013300010	Frame bridge strain relief plate		133.0
RS-ZL 144/146-5	052014400010	Frame bridge strain relief plate	also for internal width 146 mm	144.0
RS-ZL 158-5	052015800010	Frame bridge strain relief plate		158.0
RS-ZL 171-5	052017100010	Frame bridge strain relief plate		171.0
RS-ZL 182-5	052018200010	Frame bridge strain relief plate		182.0
RS-ZL 196-5	052019600010	Frame bridge strain relief plate		196.0
RS-ZL 220-5	052022000010	Frame bridge strain relief plate		220.0
RS-ZL 246-5	052024600010	Frame bridge strain relief plate		246.0

Strain relief



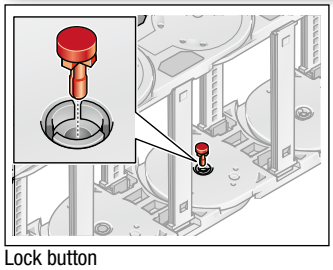
Strain relief with Steel Fix


Strain relief with Steel Fix

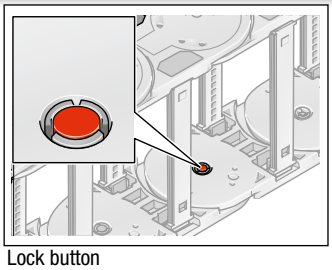
C-rails (cathodic dipped) for permanent integration, for accommodating the Steel Fix bow clamps in the chain brackets. The bow clamps can take up to 3 cables and are suitable for C-rails with a groove width of 11 mm. Due to the design of the trough elements a cable preserving cable guidance is ensured. 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
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

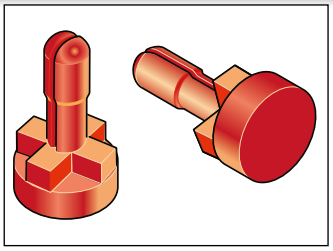
Lock button



Lock button



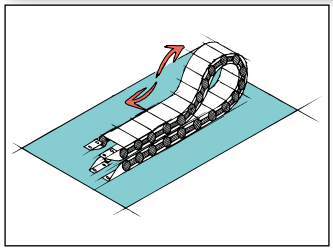
Lock button

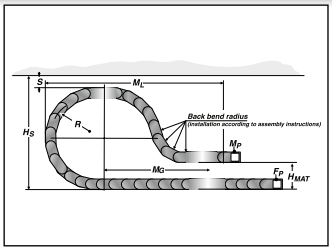


To increase the side stability, we recommend the use of lock buttons during strong lateral acceleration or when installed „laying on the side (turned 90°) without support“.

Type	Order no.
MP32/41 lock button	041000008000

Lowered fixing point





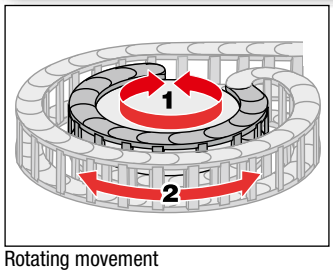
It is sometimes necessary to lower the height of the moving attachment point.

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

Please contact our application engineers.

Radius R mm	Height of moving end connection (H_{MAT}) mm	Safety margin (S) mm	Installation height incl. safety (H_S) mm	Projection (M_L) mm	Additional links qty.	of which additional back chain links qty.
200.0	190.0	50.0	522.0	770.0	13.0	2.0
250.0	220.0	50.0	622.0	910.0	15.0	2.0
300.0	280.0	50.0	722.0	1180.0	19.0	2.0
350.0	320.0	50.0	822.0	1140.0	19.0	3.0

Back radii

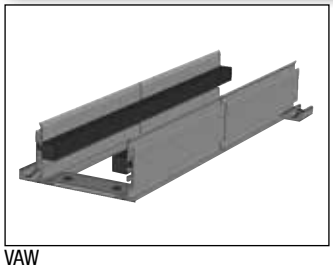


Rotating movement

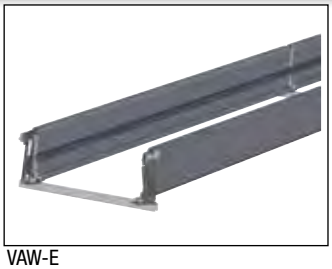
Side links with radius forward (R) and radius backward (Rü) allow for movement in two directions. This is intended for rotating movements and lowered chain brackets.

Type	Order no.	Radius mm	Back radius mm
SR 41.2 (RÜ200/R125)	041200009060	125.0	200.0
SR 41.2 (RÜ200/R160)	041200012060	160.0	200.0
SR 41.2 (RÜ200/R175)	041200015060	175.0	200.0
SR 41.2 (RÜ200/R200)	041200020060	200.0	200.0
SR 41.2 (RÜ200/R250)	041200025060	250.0	200.0
SR 41.2 (RÜ200/R300)	041200030060	300.0	200.0
SR 41.2 (RÜ200/R350)	041200035060	350.0	200.0

Guide channels (VAW)



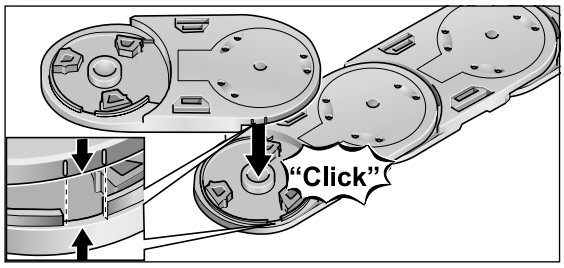
VAW



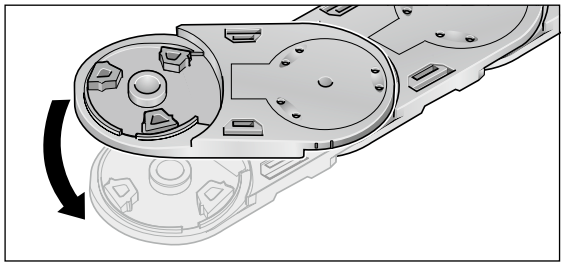
VAW-E

For this cable drag chain, a range of variable guide channel systems are available, constructed from aluminium or stainless steel 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“.

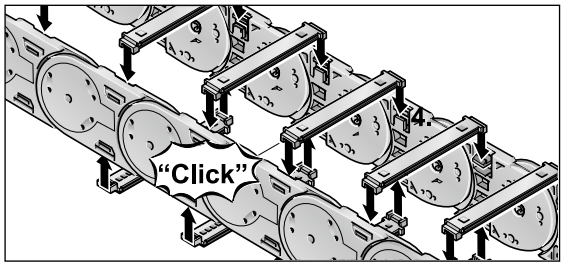
Assembly



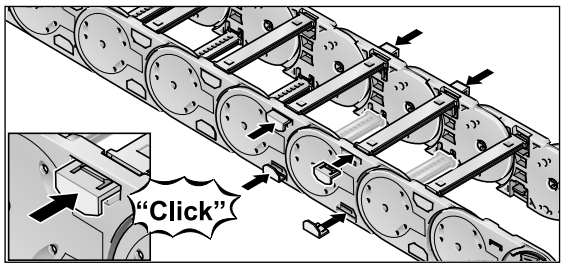
Step 1



Step 2

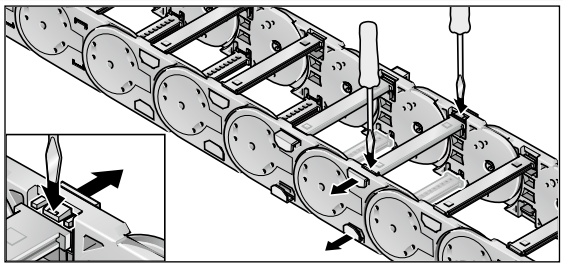


Step 3

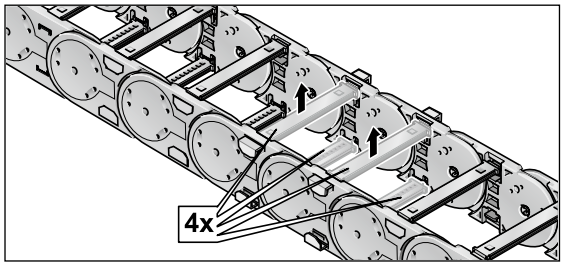


Step 4

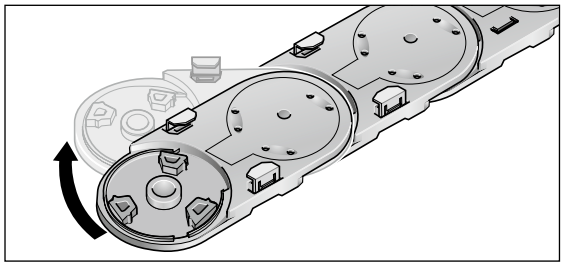
Disassembly



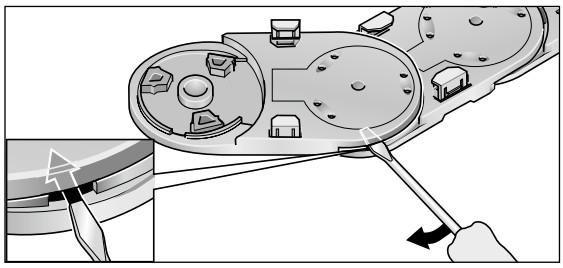
Step 1



Step 2

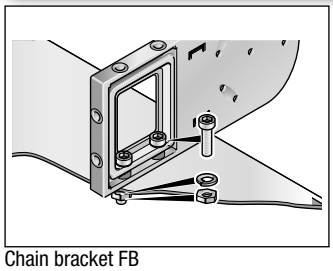


Step 3

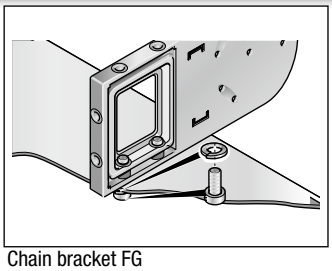


Step 4

Assembly instruction flexible chain bracket



Chain bracket FB



Chain bracket FG

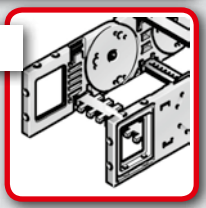
Brass bushes guarantee long-lasting fastening without cold flow in the plastic.

Version KA-FB:
Integrated through-hole fastened down using screw and nut.
Version KA-FG:
Built-in threads allow for quick and easy on-site mounting, since a screw, including a retaining washer where necessary, is sufficient.

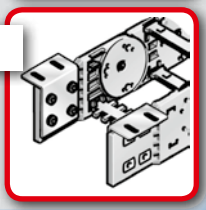
System overview

1 Chain bracket

Chain bracket flexible

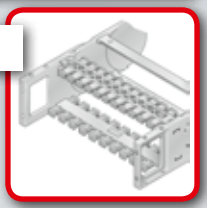


Chain bracket angle

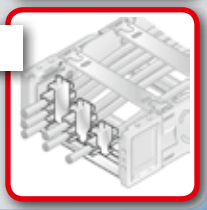


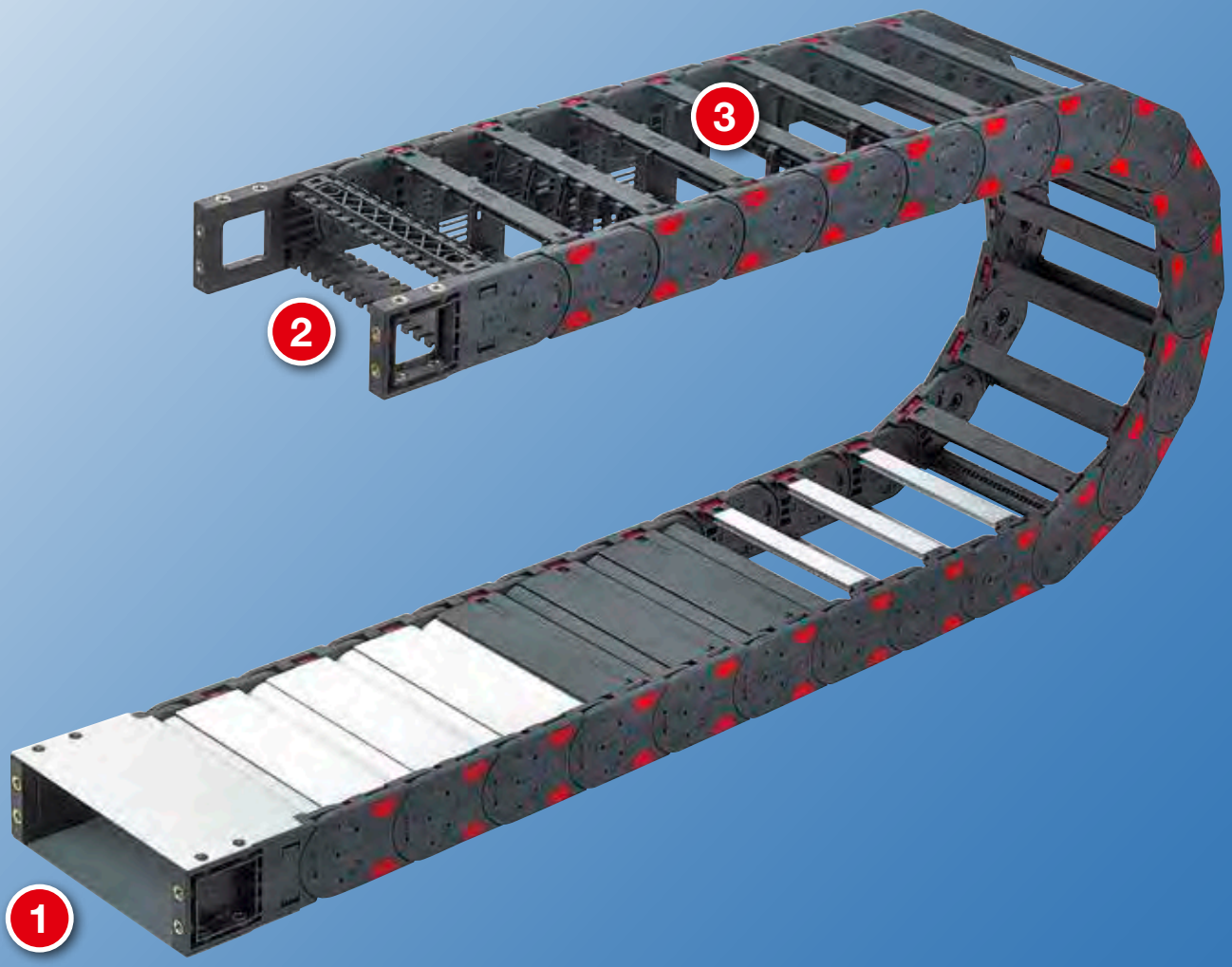
2 Strain relief

Frame bridge RS-ZL



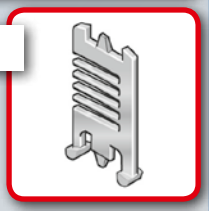
STF Steel Fix



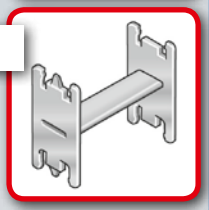


3 Shelving system

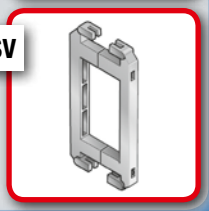
Separator TR



H-shaped shelf unit RE



Frame bridge connector RSV

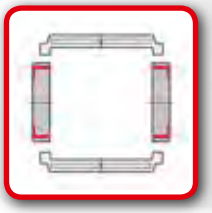


Guide channels

Aluminium VAW

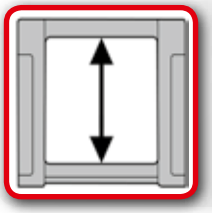
Stainless steel VAW-E

Technical data



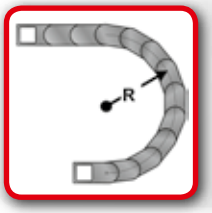
Loading side

inside and outside flexure curve



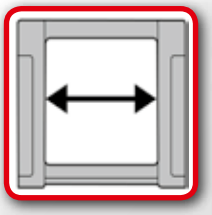
Available interior heights

52.0 mm



Available radii

100.0 – 350.0 mm



Available interior widths

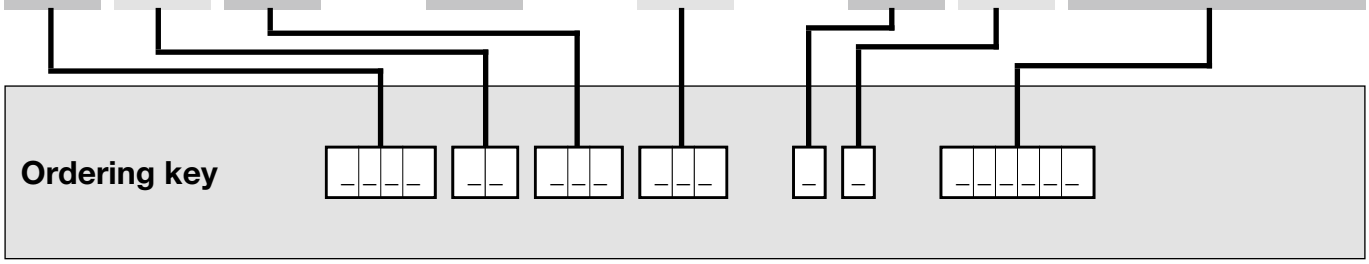
45.0 – 546.0 mm

With aluminium frame bridge
80.0 – 600.0 mm

Ordering key

Type	Variation						
		Inside width mm	Outside width mm	Radius mm	Ridge version	Material	Chain length mm
0522 0523	30 44[3]	45[1] 62[1] 71 84 96[2] 107 121[2] 133 144 146[2] 158 171 182 196[2] 220 246[2] 296[2] 346[2] 396[1] 421[1] 446[1] 496[1] 546[1]	77[1] 94[1] 103 116 128 139 153 165 176 178 190 203 214 228 252 278 328 378 428[1] 453[1] 478[1] 528[1] 578[1]	100[1] 150 175 200 250 300 350	0 1 2[1] 3[1] 4 5 6[1] 7[1] 9[1]	0 5[1] 7[1] 9	

[1] for variant 30 only
[2] also available with plastic cover
[3] reduced inner height, reduced max. cable diameter, see chain link drawing (values in brackets)



Note on configuration

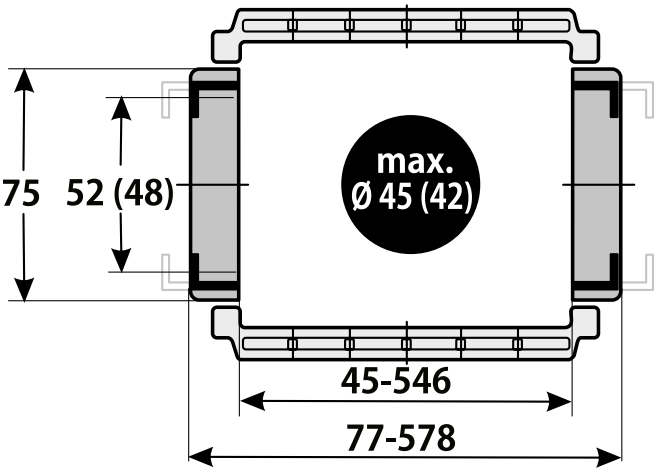
Frame bridges and cover from aluminium:
Aluminium frame bridges and covers can be supplied in 1 mm width sizes for inner widths from 80.0 mm – 600.0 mm.
If frame bridge strain relief plates (RS-ZL) are to be deployed, take standard widths into account.

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)
5	Polypropylene (PP/blue)
7	ESD (PA/light grey)
9	Special version

0	PA full-ridged with bias
1	PA full-ridged without bias
2	PA half-ridged with bias
3	PA half-ridged without bias
4	Aluminium full-ridged with bias
5	Aluminium full-ridged without bias
6	Aluminium half-ridged with bias
7	Aluminium half-ridged without bias
9	Special version

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

Order sample: 0522 30 220 100 0 0 1365
Frame bridge in outside bend, frame bridge in inside bend, can be opened from inside and outside bend
Inside width 220 mm; radius 100 mm
Plastic bridge, full-ridged with bias, material black-coloured polyamide
Chain length 1365 mm (15 links)

Technical specifications

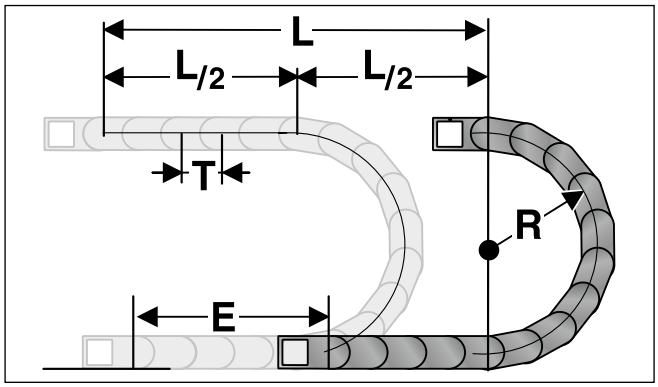
Travel distance gliding L_g max.:	150.0 m
Travel distance self-supporting L_f max.:	see diagram
Travel distance vertical, hanging L_{vh} max.:	60.0 m
Travel distance vertical, upright L_{vs} max.:	6.0 m
Rotated 90°, unsupported L_{90f} max.:	2.0 m
Speed, gliding V_g max.:	5.0 m/s
Speed, self-supporting V_f max.:	20.0 m/s
Acceleration, gliding a_g max.:	25.0 m/s²
Acceleration, self-supporting a_f max.:	30.0 m/s²

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:	UL 94 HB

Other material properties on request.

Determining the chain length

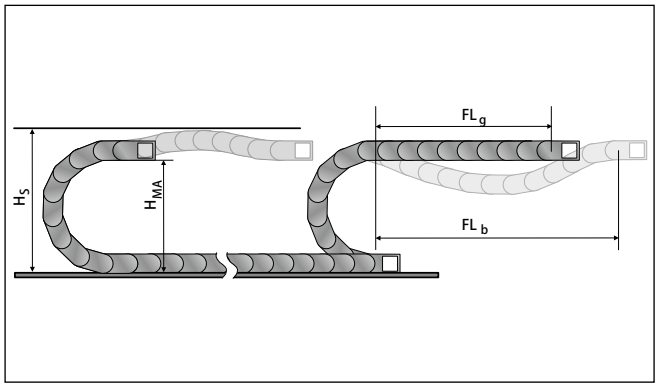


The fixed point of the cable drag chain should be connected in the middle of the travel distance.
This arrangement gives the shortest connection between the fixed point and the moving consumer and thus the most efficient chain length.

Chain length calculation = L/2 + π * R + E
≈ 1 m chain = 11 qty. x 91.0 mm links.

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

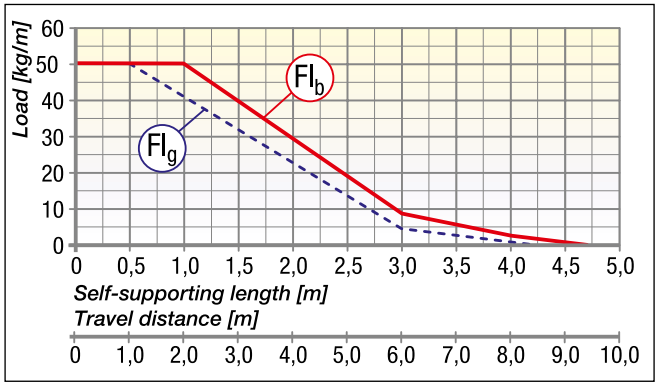
Self-supporting length



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

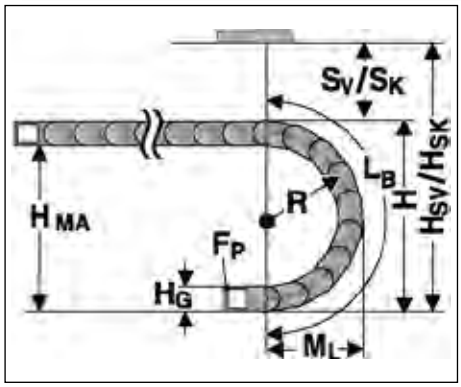
Load diagram for self-supporting applications



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

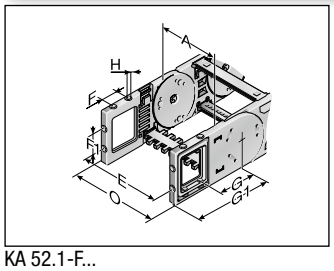
FL_b Self-supporting Length, upper run bent
In the FL_b range, the chain upper run has a sag of more than , but this is still less than the maximum sag.
Where the sag is greater than that permitted in the FL_b range, the application is critical and should be avoided. The self-supporting length can be optimized by using a support for the upper run or a more stable cable drag chain.
Closed cable drag chains (with covers) have a higher unit weight than open chains (with frame bridges). This higher weight must be taken into account when calculating the self-supporting length. To the weight of the cabling (cable load, in kg/m), you must add 1.5 kg/m, to account for the higher weight of closed-cover chains.

Installation dimensions



Radius R	100	150	175	200	250	300	350
Outside height of chain link (H_G)	75	75	75	75	75	75	75
Height of bend (H)	305	405	455	505	605	705	805
Height of moving end connection (H_{MA})	230	330	380	430	530	630	730
Safety margin with bias (S_V)	46	46	46	46	46	46	46
Installation height with bias (H_{SV})	351	451	501	551	651	751	851
Safety margin without bias (S_K)	16	16	16	16	16	16	16
Installation height without bias (H_{SK})	321	421	471	521	621	721	821
Arc projection (M_L)	244	294	319	344	394	444	494
Bend length (L_B)	570	727	805	884	1041	1198	1355

Chain bracket flexible

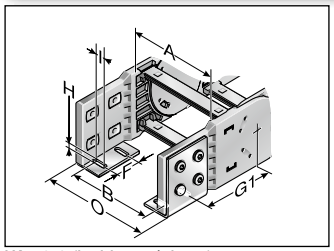


KA 52.1-F...

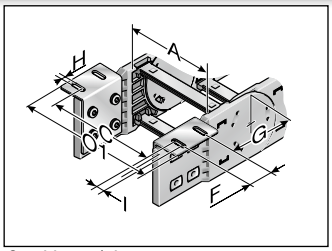
This chain bracket offers universal connection options (top, bottom and front) and is attached to the ends of the chain like a side link. This allows the chain to move right up to the bracket. Each chain requires one male and one female bracket. M8 screws are used to secure the brackets in place. Extrusion-coated metal bushes with either a through-hole (-FB) or a threaded hole (-FG) ensure the permanent, high-strength transmission of even extreme forces onto the cable drag chain.

Type	Order no.	Mate-rial	Version	Inside width A mm	E mm	F mm	F1 mm	G mm	G1 mm	H	HØ mm	Outside width KA O mm
KA 52.1-FB male	0521000056	Plastic	with bush	45.0 – 546.0	A+16.0	35.0	30.0	89.0	146.0		8.5	A+36.0
KA 52.1-FB female	0521000057	Plastic	with bush	45.0 – 546.0	A+16.0	35.0	30.0	89.0	146.0		8.5	A+36.0
KA 52.1-FG male	0521000058	Plastic	with thread	45.0 – 546.0	A+16.0	35.0	30.0	89.0	146.0	M8		A+36.0
KA 52.1-FG female	0521000059	Plastic	with thread	45.0 – 546.0	A+16.0	35.0	30.0	89.0	146.0	M8		A+36.0

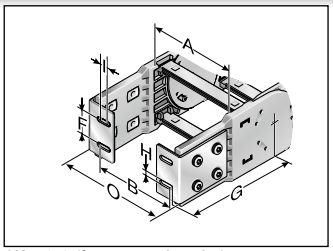
Chain bracket angle



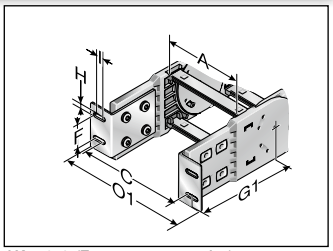
KA 52.1 (inside up / down)



Outside up / down



KA 52.1 (front page interior)

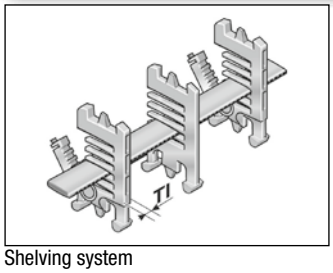


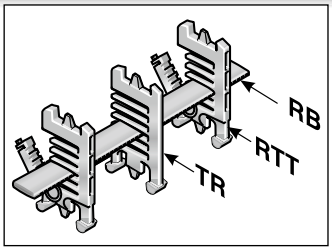
KA 52.1 (Front page exterior)

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 M6 screws.

Type	Order no.	Material	Inside width A mm	B mm	C mm	F mm	G mm	G1 mm	HØ mm	I mm	Outside width KA O mm	Outside width KA O1 mm
KA 52.1 male	0521000050	Sheet steel	45.0 – 546.0	A-2.5	A+34.5	32.0	95.5	149.0	6.5	14.0	A+32.0	A+71.0
KA 52.1 female	0521000051	Sheet steel	45.0 – 546.0	A-2.5	A+34.5	32.0	95.5	149.0	6.5	14.0	A+32.0	A+71.0

Shelving system



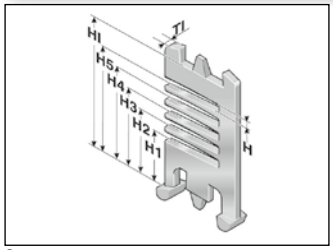


Shelving system

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. Pre-assembly is not necessary as the shelving system and cabling can be assembled quickly and easily on site.

Type	Order no.	Designation	Width mm	Pitch mm	TI mm
RB 028-5	100000002800	Shelf	28.0	5.6	
RB 056-5	100000005601	Shelf	56.0	5.6	
RB 084-5	100000008400	Shelf	84.0	5.6	
RB 112-5	100000011200	Shelf	112.0	5.6	
RB 140-5	100000014000	Shelf	140.0	5.6	
RB 168-5	100000016800	Shelf	168.0	5.6	
RB 196-5	100000019600	Shelf	196.0	5.6	
RTT 52	100090522000	Shelf support, divisible		5.6	7.0

Separator

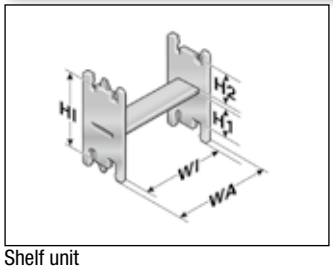


Separator

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	TI mm	H mm	H1 mm	H2 mm	H3 mm	H4 mm	H5 mm	HI mm
TR 52.1	052100009200	TR 52.1 Separator	5.6	3.5	4.0	15.6	22.0	28.2	34.6	41.0	52.0

Shelf unit



Shelf unit

Insert to obtain additional levels in pre-defined window distances.

Type	Order no.	Designation	Pitch mm	WA mm	WI mm	H1 mm	H2 mm	HI mm
RE 36/17	100000361714	H-shaped shelf unit	5.6	42.5	36.5	31.0	17.4	52.0
RE 59/24	100000592414	H-shaped shelf unit	5.6	65.0	59.0	24.2	24.2	52.0
RE 81/12	100000811214	H-shaped shelf unit	5.6	87.5	81.5	36.0	12.4	52.0

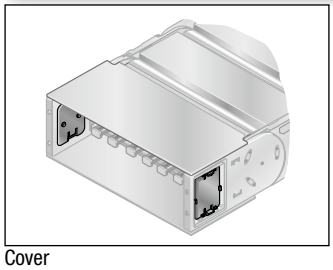
Bracket bar

Bracket bar

Large-diameter conduits are routed securely by using a bracket bar (BS). This bar is installed on the frame bridges or the covers of the cable drag chain.
The bracket bar can be installed on both the inside and outside bend.
The bracket bar support (BSH) is used to attach the bars to PowerLine series frame bridges. Two bracket bar supports are required for each bar.

Type	Order no.	Designation	Conduit diameter max. mm	Installation height (EH) mm	Inner chain width min. mm
BS 120-5	052412000000	Bracket bar	115.0	140.0	171.0
BS 153-5	052415300000	Bracket bar	148.0	170.0	220.0
BS 187-5	052418700000	Bracket bar	182.0	205.0	246.0
BSH-5	052400000000	Bracket bar support			

Cover chain bracket

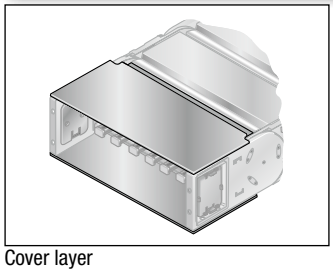


Cover

Self-locking covers close the side mounting window on the flexible chain bracket (KA-FB/FG).

Type	Order no.
Cover D5 KA 52.1-FB/FG	0523888002

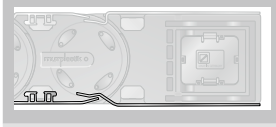
Cover chain bracket



Cover layer

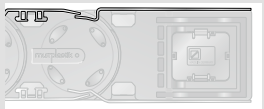
Constructed from aluminium, the canopies for the flexible chain bracket (KA-FB/FG) ensure a continuously closed system for chains with covers.

Canopy for chain bracket, fixed point outside bend: Type and part number configurator



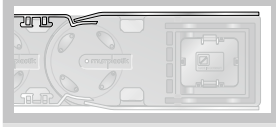
Type:	KA 52.1 FB/FG AB	Inside width	2-2
Order no.:	0521	Inside width	060

Cover for chain bracket fixed point inside bend: Type and part number configurator



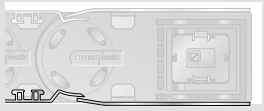
Type:	KA 52.1 FB/FG IB	Inside width	2-2
Order no.:	0521	Inside width	058

Cover for chain bracket moving end outside bend: Type and part number configurator



Type:	KA 52.1 FB/FG AB	Inside width	1-2
Order no.:	0521	Inside width	059

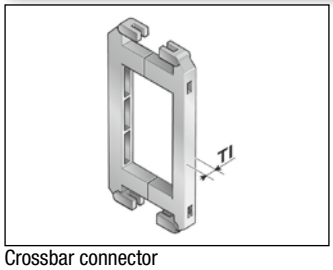
Cover for chain bracket moving end inside bend: Type and part number configurator



Type:	KA 52.1 FB/FG IB	Inside width	1-2
Order no.:	0521	Inside width	057

Sample order:
0521096058 KA 52.1 FB/FG IB 096 2-2
Chain bracket cover at fixing point in inner bend, for inner width of 96 mm.

Crossbar connector

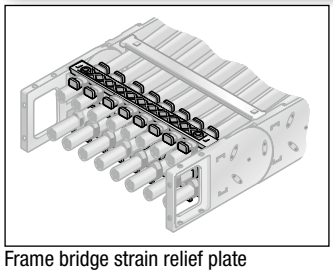


Crossbar connector

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	TI mm
RSV 52	052000009600	Crossbar connector	7.5
RSV 52 Alu	052000009800	Crossbar connector for aluminium frame bridges	7.5

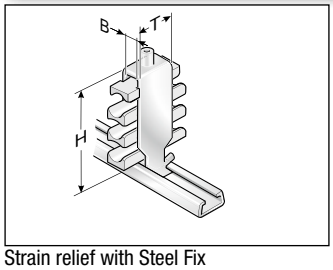
Frame bridge strain relief plate


Frame bridge strain relief plate

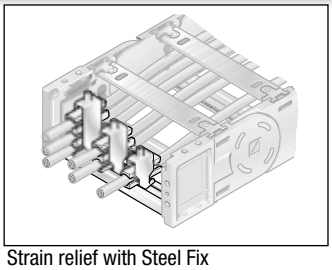
Fixed integrated frame bridge strain relief plates in the chain brackets. Tailored to all frame bridge widths up to 246 mm. May be assembled on the inside and outside bends at both chain endings.

Type	Order no.	Designation	Note	For internal width mm
RS-ZL 045-5	052004500010	Frame bridge strain relief plate		45.0
RS-ZL 062-5	052006200010	Frame bridge strain relief plate		62.0
RS-ZL 071-5	052007100010	Frame bridge strain relief plate		71.0
RS-ZL 084-5	052008400010	Frame bridge strain relief plate		84.0
RS-ZL 096-5	052009600010	Frame bridge strain relief plate		96.0
RS-ZL 107-5	052010700010	Frame bridge strain relief plate		107.0
RS-ZL 121-5	052012100010	Frame bridge strain relief plate		121.0
RS-ZL 133-5	052013300010	Frame bridge strain relief plate		133.0
RS-ZL 144/146-5	052014400010	Frame bridge strain relief plate	also for internal width 146 mm	144.0
RS-ZL 158-5	052015800010	Frame bridge strain relief plate		158.0
RS-ZL 171-5	052017100010	Frame bridge strain relief plate		171.0
RS-ZL 182-5	052018200010	Frame bridge strain relief plate		182.0
RS-ZL 196-5	052019600010	Frame bridge strain relief plate		196.0
RS-ZL 220-5	052022000010	Frame bridge strain relief plate		220.0
RS-ZL 246-5	052024600010	Frame bridge strain relief plate		246.0

Strain relief



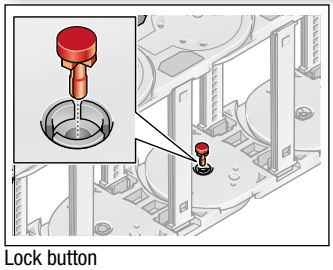
Strain relief with Steel Fix


Strain relief with Steel Fix

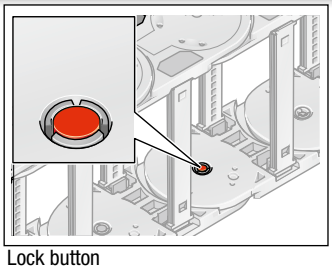
C-rails (cathodic dipped) for permanent integration, for accommodating the Steel Fix bow clamps in the chain brackets. The bow clamps can take up to 3 cables and are suitable for C-rails with a groove width of 11 mm. Due to the design of the trough elements a cable preserving cable guidance is ensured. 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
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

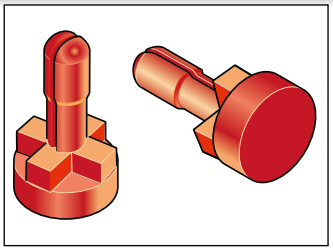
Lock button



Lock button



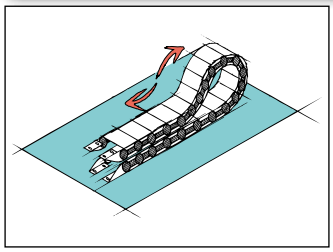
Lock button

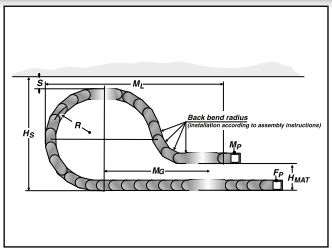


To increase the side stability, we recommend the use of lock buttons during strong lateral acceleration or when installed „laying on the side (turned 90°) without support“.

Type	Order no.
MP52/62/72 lock button	0520000080

Lowered fixing point





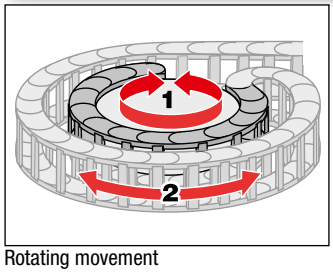
It is sometimes necessary to lower the height of the moving attachment point.

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

Please contact our application engineers.

Radius R mm	Height of moving end connection (H_{MAT}) mm	Safety margin (S) mm	Installation height incl. safety (H_S) mm	Projection (M_L) mm	Additional links qty.	of which additional back chain links qty.
200.0	210.0	50.0	565.0	830.0	10.0	3.0
250.0	250.0	50.0	665.0	990.0	13.0	3.0
300.0	300.0	50.0	765.0	900.0	14.0	3.0
350.0	330.0	50.0	865.0	1180.0	16.0	3.0

Back radii

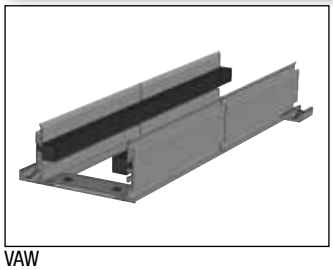


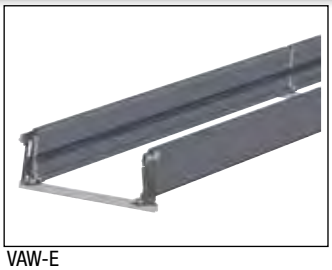
Rotating movement

Side links with radius forward (R) and radius backward (Rü) 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 52.2 (RÜ200/R135) left	052200010060	135.0	200.0
SR 52.2 (RÜ200/R135) right	052200010062	135.0	200.0
SR 52.2 (RÜ200/R170) left	052200015060	170.0	200.0
SR 52.2 (RÜ200/R170) right	052200015062	170.0	200.0
SR 52.2 (RÜ200/R200) left	052200020060	200.0	200.0
SR 52.2 (RÜ200/R200) right	052200020062	200.0	200.0
SR 52.2 (RÜ200/R250) left	052200025060	250.0	200.0
SR 52.2 (RÜ200/R250) right	052200025062	250.0	200.0
SR 52.2 (RÜ200/R300) left	052200030060	300.0	200.0
SR 52.2 (RÜ200/R300) right	052200030062	300.0	200.0
SR 52.2 (RÜ200/R350) left	052200035060	350.0	200.0
SR 52.2 (RÜ200/R350) right	052200035062	350.0	200.0

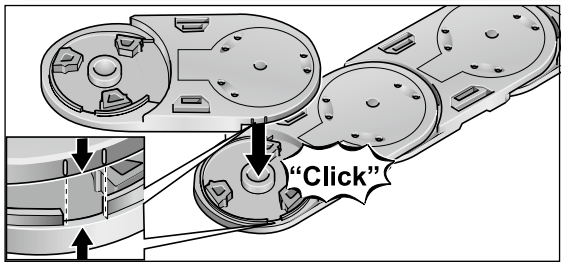
Guide channels (VAW)


VAW

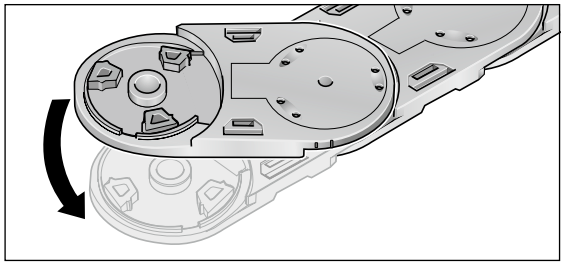

VAW-E

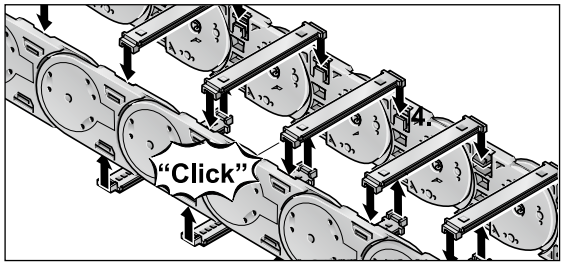
For this cable drag chain, a range of variable guide channel systems are available, constructed from aluminium or stainless steel sections.
The variable guide channel ensures that the cable drag chain is supported and guided securely.
For help on choosing, please consult the chapter „Variable Guide Channel System“.

Assembly

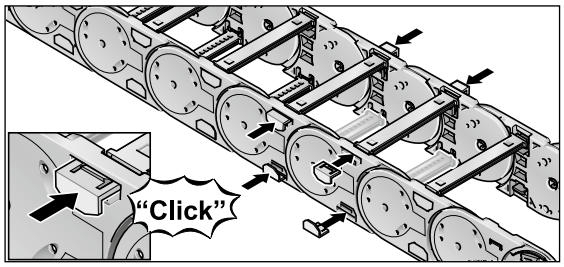


Step 1


Step 2

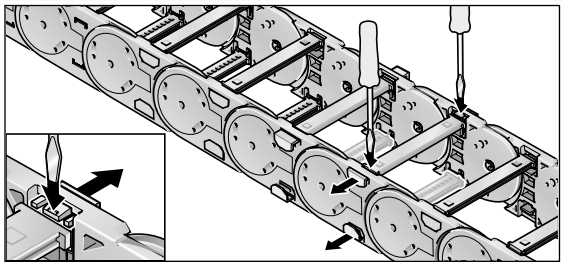


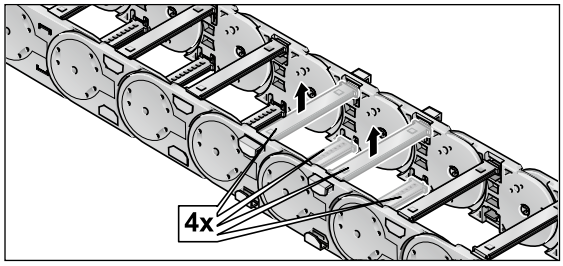
Step 3



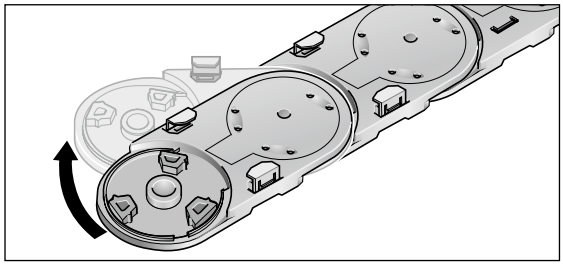
Step 4

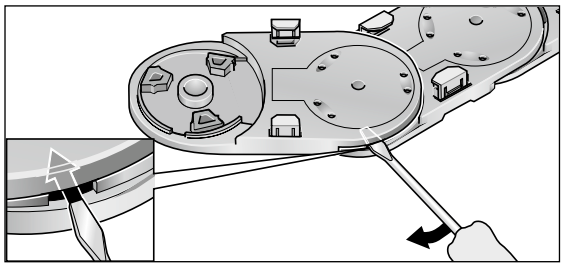
Disassembly


Step 1

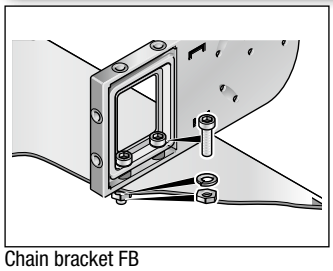


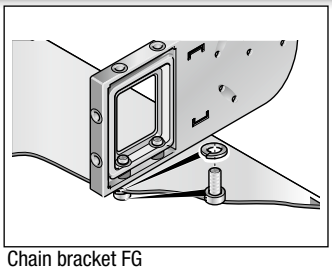
Step 2


Step 3


Step 4

Assembly instruction flexible chain bracket


Chain bracket FB


Chain bracket FG

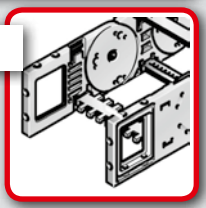
Brass bushes guarantee long-lasting fastening without cold flow in the plastic.

Version KA-FB:
Integrated through-hole fastened down using screw and nut.
Version KA-FG:
Built-in threads allow for quick and easy on-site mounting, since a screw, including a retaining washer where necessary, is sufficient.

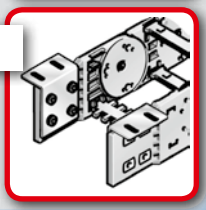
System overview

1 Chain bracket

Chain bracket flexible

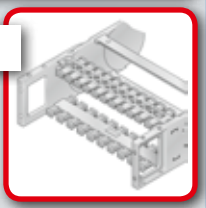


Chain bracket angle

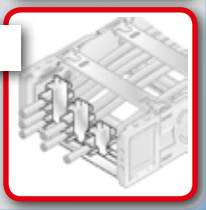


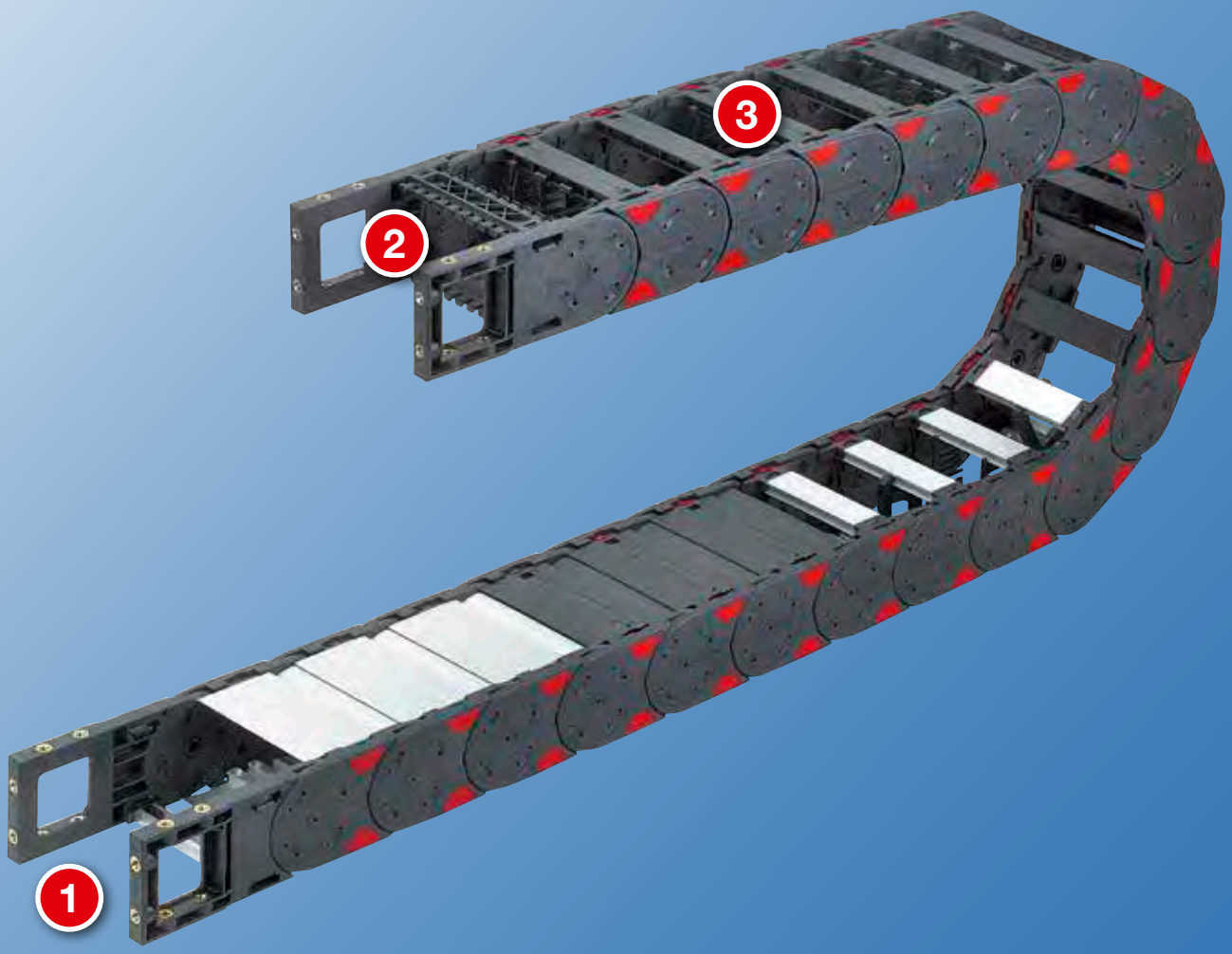
2 Strain relief

Frame bridge RS-ZL



STF Steel Fix

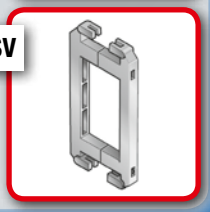




3 Shelving system

Separator TR

Frame bridge connector RSV

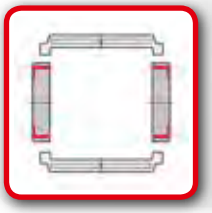


Guide channels

Aluminium VAW

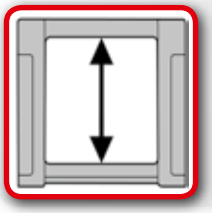
Stainless steel VAW-E

Technical data



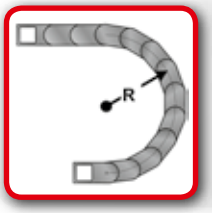
Loading side

inside and outside flexure curve



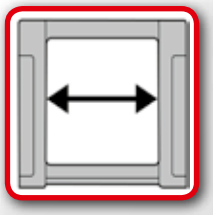
Available interior heights

62.0 mm



Available radii

150.0 – 500.0 mm



Available interior widths

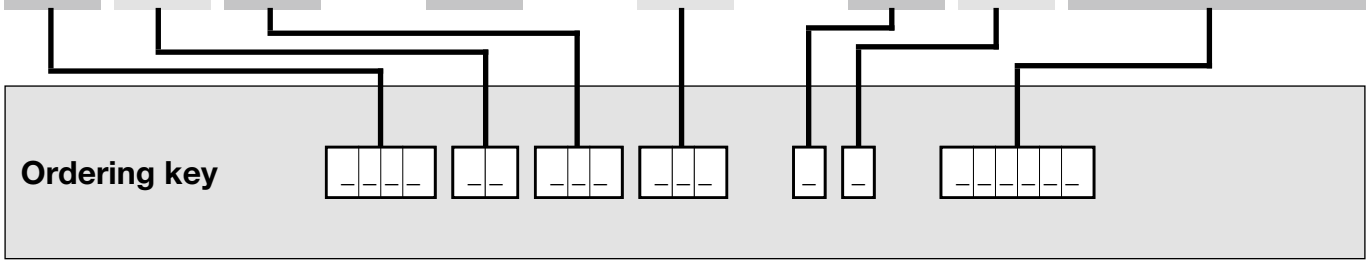
118.0 – 518.0 mm

With aluminium frame bridge
118.0 – 600.0 mm

Ordering key

Type	Variation	Inside width mm	Outside width mm	Radius mm	Ridge version	Material	Chain length mm
0622 0623	30 44	118[2] 143[2] 168 193[2] 218 243[2] 268 293[2] 318 343[2] 368 418[2] 468[1] 518[1]	150 175 200 225 250 275 300 325 350 375 400 450 500[1] 550[1]	150[1] 200 250 300 350 400 500	0 1 2[1] 3[1] 4 5 6[1] 7[1] 9[1]	0 5[1] 7[1] 9	

[1] for variant 30 only
[2] also available with plastic cover



Note on configuration

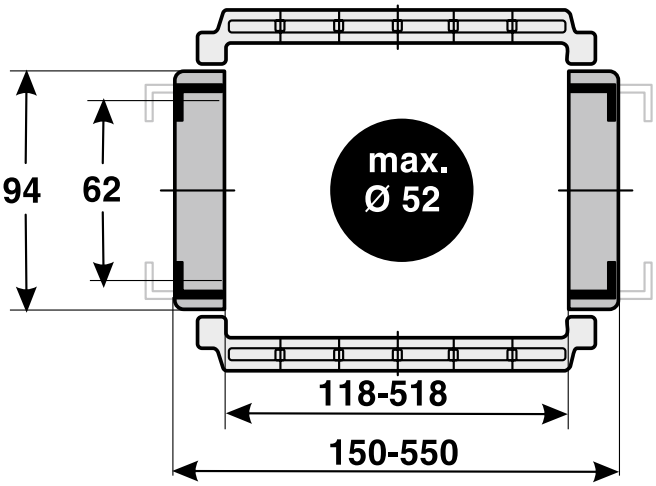
Frame bridges and cover from aluminium:
Aluminium frame bridges and covers can be supplied in 1 mm width sizes for inner widths from 118.0 mm – 600.0 mm.
If frame bridge strain relief plates (RS-ZL) are to be deployed, take standard widths into account.

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)
5	Polypropylene (PP/blue)
7	ESD (PA/light grey)
9	Special version

0	PA full-ridged with bias
1	PA full-ridged without bias
2	PA half-ridged with bias
3	PA half-ridged without bias
4	Aluminium full-ridged with bias
5	Aluminium full-ridged without bias
6	Aluminium half-ridged with bias
7	Aluminium half-ridged without bias
9	Special version

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

Order sample: 0622 30 118 150 0 0 1600
Frame bridge in outside bend, frame bridge in inside bend, can be opened from inside and outside bend
Inside width 118 mm; radius 150 mm
Plastic bridge, full-ridged with bias, material black-coloured polyamide
Chain length 1600 mm (16 links)

Technical specifications

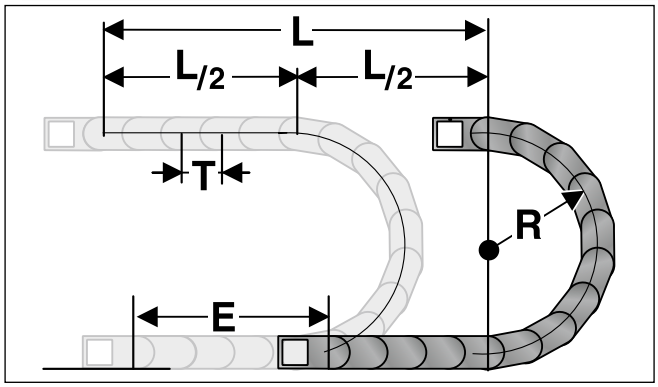
Travel distance gliding L_g max.:	150.0 m
Travel distance self-supporting L_f max.:	see diagram
Travel distance vertical, hanging L_{vh} max.:	65.0 m
Travel distance vertical, upright L_{vs} max.:	6.0 m
Rotated 90°, unsupported L_{90f} max.:	4.0 m
Speed, gliding V_g max.:	5.0 m/s
Speed, self-supporting V_f max.:	20.0 m/s
Acceleration, gliding a_g max.:	25.0 m/s²
Acceleration, self-supporting a_f max.:	40.0 m/s²

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:	UL 94 HB

Other material properties on request.

Determining the chain length

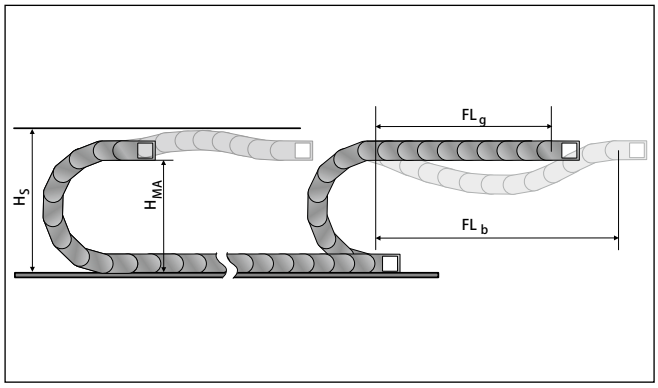


The fixed point of the cable drag chain should be connected in the middle of the travel distance.
This arrangement gives the shortest connection between the fixed point and the moving consumer and thus the most efficient chain length.

Chain length calculation = L/2 + π * R + E
≈ 1 m chain = 10 qty. x 100.0 mm links.

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

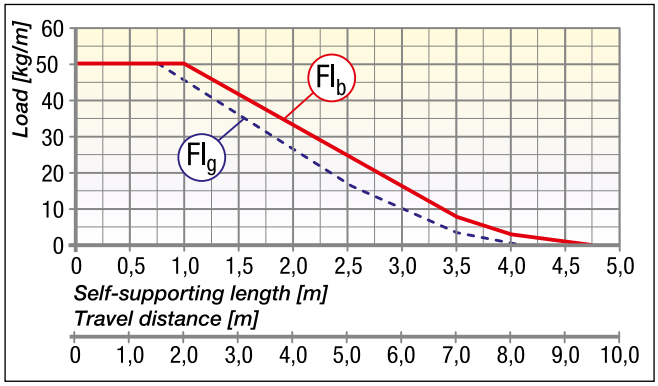
Self-supporting length



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

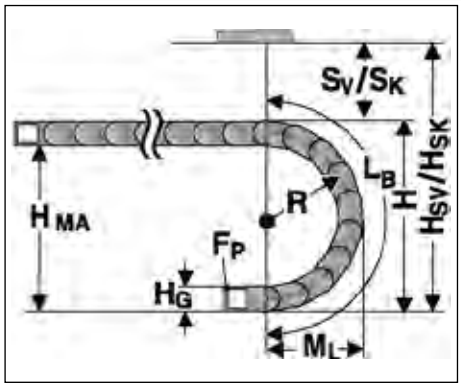
Load diagram for self-supporting applications



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

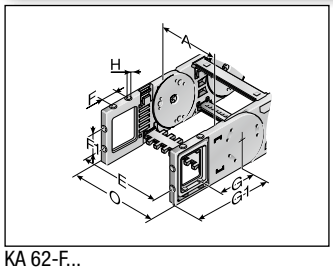
FL_b Self-supporting Length, upper run bent
In the FL_b range, the chain upper run has a sag of more than , but this is still less than the maximum sag.
Where the sag is greater than that permitted in the FL_b range, the application is critical and should be avoided. The self-supporting length can be optimized by using a support for the upper run or a more stable cable drag chain.
Closed cable drag chains (with covers) have a higher unit weight than open chains (with frame bridges). This higher weight must be taken into account when calculating the self-supporting length. To the weight of the cabling (cable load, in kg/m), you must add 3.1 kg/m, to account for the higher weight of closed-cover chains.

Installation dimensions



Radius R	150	200	250	300	350	400	500
Outside height of chain link (H_G)	94	94	94	94	94	94	94
Height of bend (H)	424	524	624	724	824	924	1124
Height of moving end connection (H_{MA})	330	430	530	630	730	830	1030
Safety margin with bias (S_V)	50	50	50	50	50	50	50
Installation height with bias (H_{SV})	474	574	674	774	874	974	1174
Safety margin without bias (S_K)	20	20	20	20	20	20	20
Installation height without bias (H_{SK})	444	544	644	744	844	944	1144
Arc projection (M_L)	312	362	412	462	512	562	662
Bend length (L_B)	766	923	1080	1237	1394	1551	1865

Chain bracket flexible

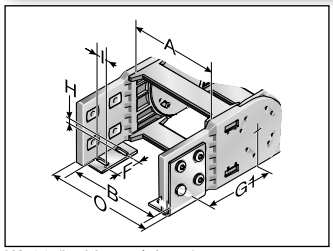


KA 62-F...

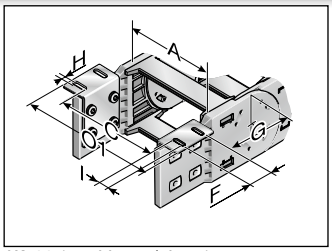
This chain bracket offers universal connection options (top, bottom and front) and is attached to the ends of the chain like a side link. This allows the chain to move right up to the bracket. Each chain requires one male and one female bracket. M8 screws are used to secure the brackets in place. Extrusion-coated metal bushes with either a through-hole (-FB) or a threaded hole (-FG) ensure the permanent, high-strength transmission of even extreme forces onto the cable drag chain.

Type	Order no.	Mate-rial	Version	Inside width A mm	E mm	F mm	F1 mm	G mm	G1 mm	H	HØ mm	Outside width KA 0 mm
KA 62-FB male	0620000056	Plastic	with bush	118.0 – 518.0	A+17.0	35.0	45.0	107.0	171.5		8.5	A+36.0
KA 62-FB female	0620000057	Plastic	with bush	118.0 – 518.0	A+17.0	35.0	45.0	107.0	171.5		8.5	A+36.0
KA 62-FG male	0620000058	Plastic	with thread	118.0 – 518.0	A+17.0	35.0	45.0	107.0	171.5	M8		A+36.0
KA 62-FG female	0620000059	Plastic	with thread	118.0 – 518.0	A+17.0	35.0	45.0	107.0	171.5	M8		A+36.0

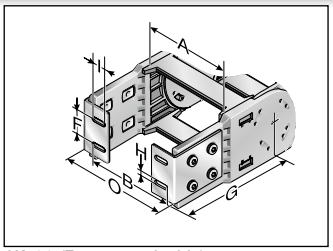
Chain bracket angle



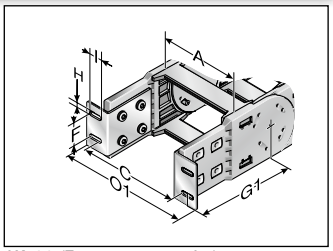
KA 62 (inside up / down)



KA 62 (outside up / down)



KA 62 (Front page inside)

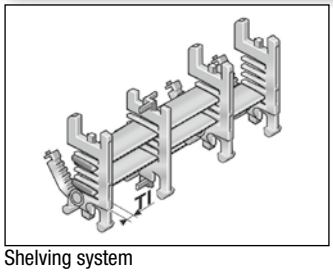


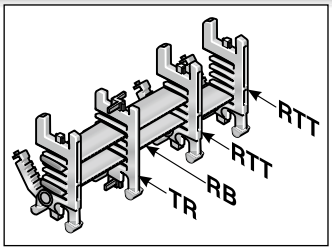
KA 62 (Front page exterior)

This chain bracket offers universal connection options (top, bottom and front) and is attached to the ends of the chain like a side link. This allows the chain to move right up to the bracket. Each chain requires one male and one female bracket. M8 screws are used to secure the brackets in place. Metal inserts (supplied) help to minimise the cold flow properties. This is an enormous advantage, guaranteeing the smooth transfer of high loads to the chain.

Type	Order no.	Material	Inside width A mm	B mm	C mm	F mm	G mm	G1 mm	HØ mm	I mm	Outside width KA 0 mm	Outside width KA 01 mm
KA 62 male	0620000050	Sheet steel	118.0 – 518.0	A-12.0	A+44.0	45.0	102.0	171.5	9.0	15.0	A+32.0	A+90.0
KA 62 female	0620000051	Sheet steel	118.0 – 518.0	A-12.0	A+44.0	45.0	102.0	171.5	9.0	15.0	A+32.0	A+90.0

Shelving system



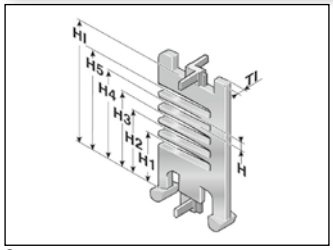


Shelving system

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	TI 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 62	100090622000	Shelf support, divisible		5.0	7.0

Separator

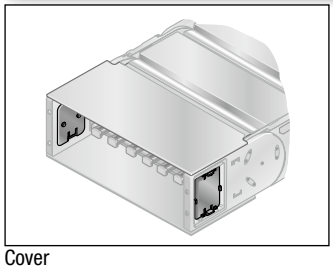


Separator

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	TI mm	H mm	H1 mm	H2 mm	H3 mm	H4 mm	H5 mm	HI mm
TR 62	062000009200	Separator	5.0	3.5	5.5	14.8	23.1	31.4	39.7	48.0	62.0

Cover chain bracket

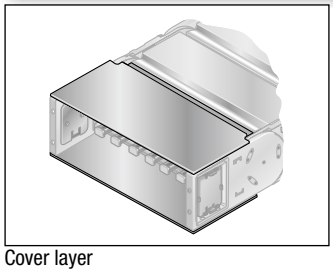


Cover

Self-locking covers close the side mounting window on the flexible chain bracket (KA-FB/FG).

Type	Order no.
Cover D6 KA 62.1-FB/FG	0623888002

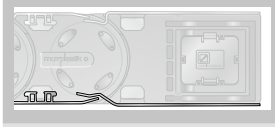
Cover chain bracket



Cover layer

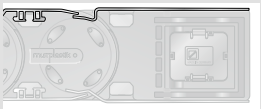
Constructed from aluminium, the canopies for the flexible chain bracket (KA-FB/FG) ensure a continuously closed system for chains with covers.

Canopy for chain bracket, fixed point outside bend: Type and part number configurator



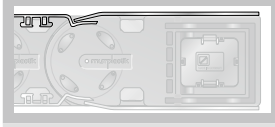
Type:	KA 62.1 FB/FG AB	Inside width	2-2
Order no.:	0621	Inside width	060

Cover for chain bracket fixed point inside bend: Type and part number configurator



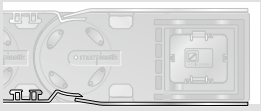
Type:	KA 62.1 FB/FG IB	Inside width	2-2
Order no.:	0621	Inside width	058

Cover for chain bracket moving end outside bend: Type and part number configurator



Type:	KA 62.1 FB/FG AB	Inside width	1-2
Order no.:	0621	Inside width	059

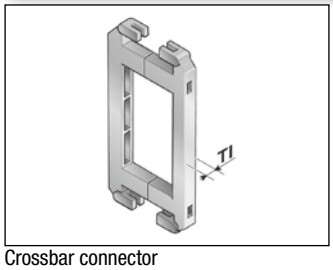
Cover for chain bracket moving end inside bend: Type and part number configurator



Type:	KA 62.1 FB/FG IB	Inside width	1-2
Order no.:	0621	Inside width	057

Sample order:
0621096058 KA 62.1 FB/FG IB 118 2-2
Chain bracket cover at fixing point in inner bend, for inner width of 118 mm.

Crossbar connector

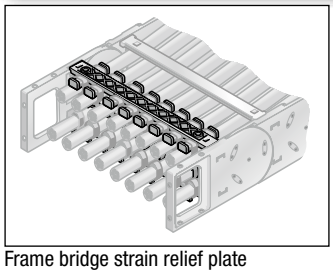


Crossbar connector

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 62	062000009600	Crossbar connector	8.0
RSV 62 Alu	062000009800	Crossbar connector for aluminium frame bridges	8.0

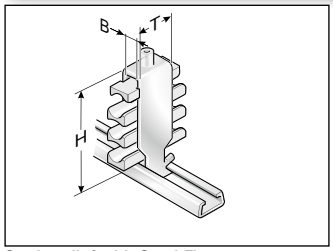
Frame bridge strain relief plate


Frame bridge strain relief plate

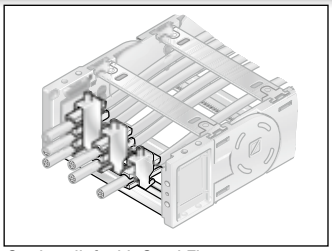
Fixed integrated frame bridge strain relief plates in the chain brackets. Accommodated to all widths of the frame bridges, up to 243 mm in size. May be assembled on the inside and outside flexure curves at both chain endings.

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
RS-ZL 243-7	072024300010	Frame bridge strain relief plate	243.0

Strain relief



Strain relief with Steel Fix


Strain relief with Steel Fix

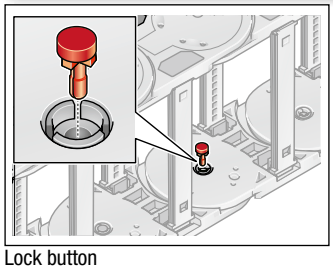
C-rails (cathodic dipped) for permanent integration, for accommodating the Steel Fix bow clamps in the chain brackets. The bow clamps can take up to 3 cables and are suitable for C-rails with a groove width of 11 mm. Due to the design of the trough elements a cable preserving cable guidance is ensured. 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.

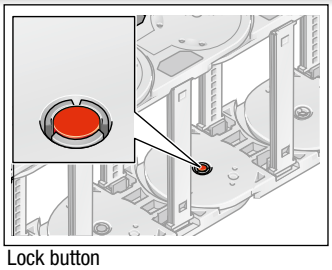
Type	Order no.	Designation	Ø mm	Seats qty.
Single clamp (for one cable)				
STF 12-1 Steel Fix	81661801	Hooped clamp	6.0 – 12.0	1
STF 14-1 Steel Fix	81661802	Hooped clamp	12.0 – 14.0	1
STF 16-1 Steel Fix	81661803	Hooped clamp	14.0 – 16.0	1
STF 18-1 Steel Fix	81661804	Hooped clamp	16.0 – 18.0	1

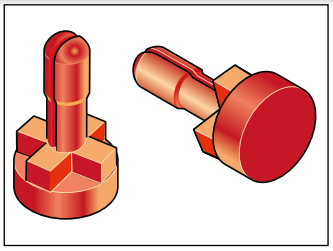
Strain relief (Continued...)

Type	Order no.	Designation	Ø mm	Seats qty.
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
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

Lock button


Lock button

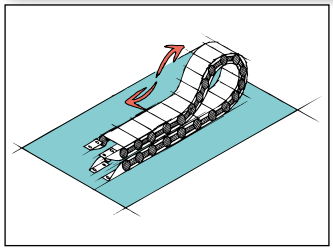

Lock button

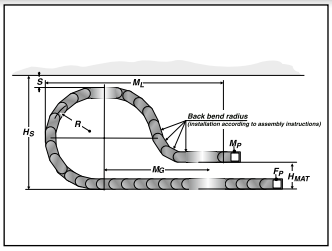


To increase the side stability, we recommend the use of lock buttons during strong lateral acceleration or when installed „laying on the side (turned 90°) without support“.

Type	Order no.
MP52/62/72 lock button	0520000080

Lowered fixing point





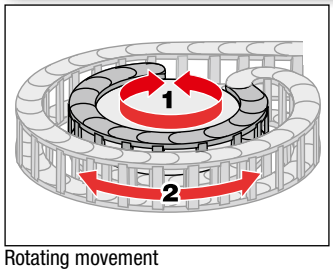
It is sometimes necessary to lower the height of the moving attachment point.

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

Please contact our application engineers.

Radius R mm	Height of moving end connection (H_{MAT}) mm	Safety margin (S) mm	Installation height incl. safety (H_S) mm	Projection (M_L) mm	Additional links qty.	of which additional back chain links qty.
200.0	230.0	60.0	564.0	850.0	11.0	2.0
250.0	270.0	60.0	664.0	990.0	12.0	2.0
300.0	320.0	60.0	764.0	1060.0	12.0	3.0
400.0	380.0	90.0	694.0	1060.0	14.0	3.0
500.0	440.0	60.0	1164.0	1520.0	17.0	3.0

Back radii

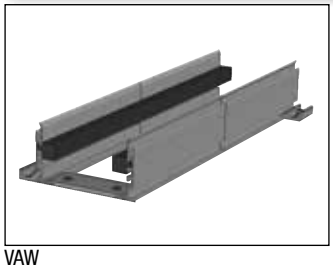


Rotating movement

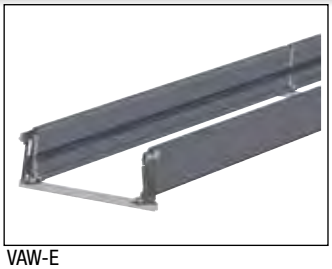
Side links with radius forward (R) and radius backward (Rü) allow for movement in two directions. This is intended for rotating movements and lowered chain brackets. Note: This type of chain has different chain links for the left or right side!

Type	Order no.	Radius mm	Back radius mm
SR 62.2 (RÜ300/R300) left	062200030060	300.0	300.0
SR 62.2 (RÜ300/R300) right	062200030062	300.0	300.0

Guide channels (VAW)



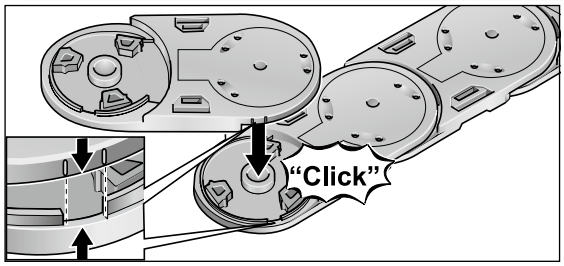
VAW



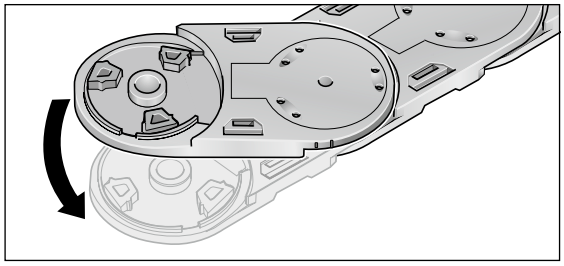
VAW-E

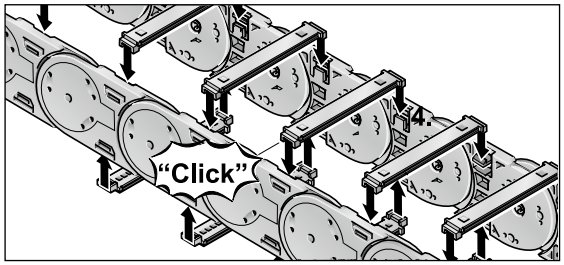
For this cable drag chain, a range of variable guide channel systems are available, constructed from aluminium or stainless steel sections.
The variable guide channel ensures that the cable drag chain is supported and guided securely.
For help on choosing, please consult the chapter „Variable Guide Channel System“.

Assembly

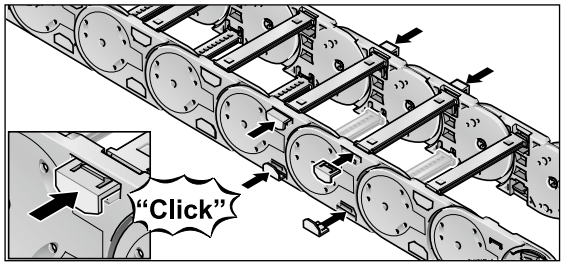


Step 1


Step 2

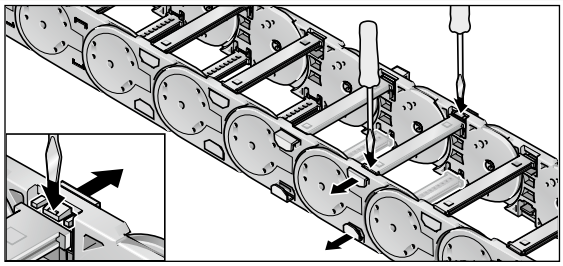


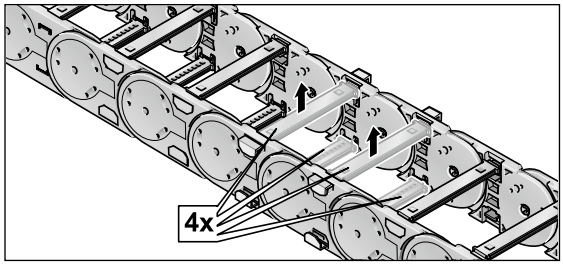
Step 3



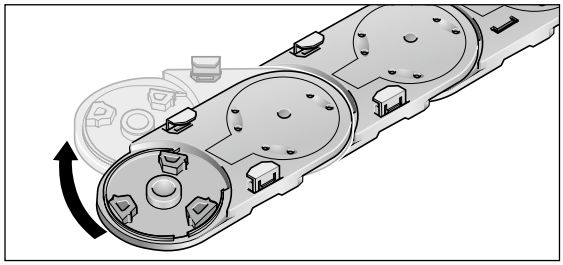
Step 4

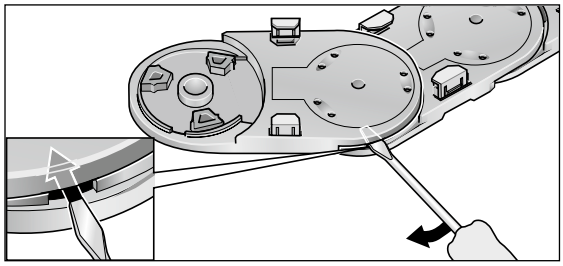
Disassembly


Step 1

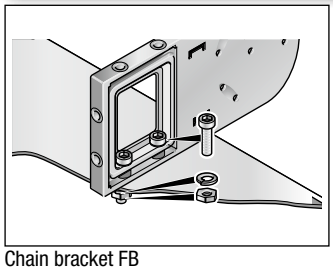


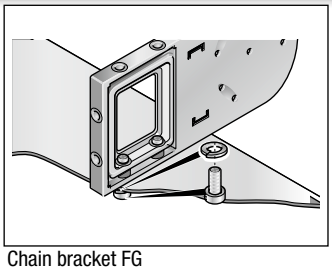
Step 2


Step 3


Step 4

Assembly instruction flexible chain bracket


Chain bracket FB


Chain bracket FG

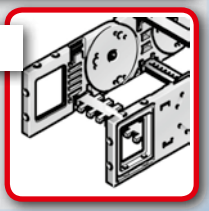
Brass bushes guarantee long-lasting fastening without cold flow in the plastic.

Version KA-FB:
Integrated through-hole fastened down using screw and nut.
Version KA-FG:
Built-in threads allow for quick and easy on-site mounting, since a screw, including a retaining washer where necessary, is sufficient.

System overview

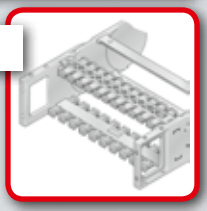
1 Chain bracket

Chain bracket flexible

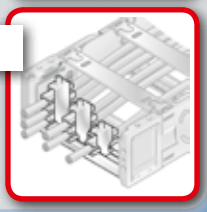


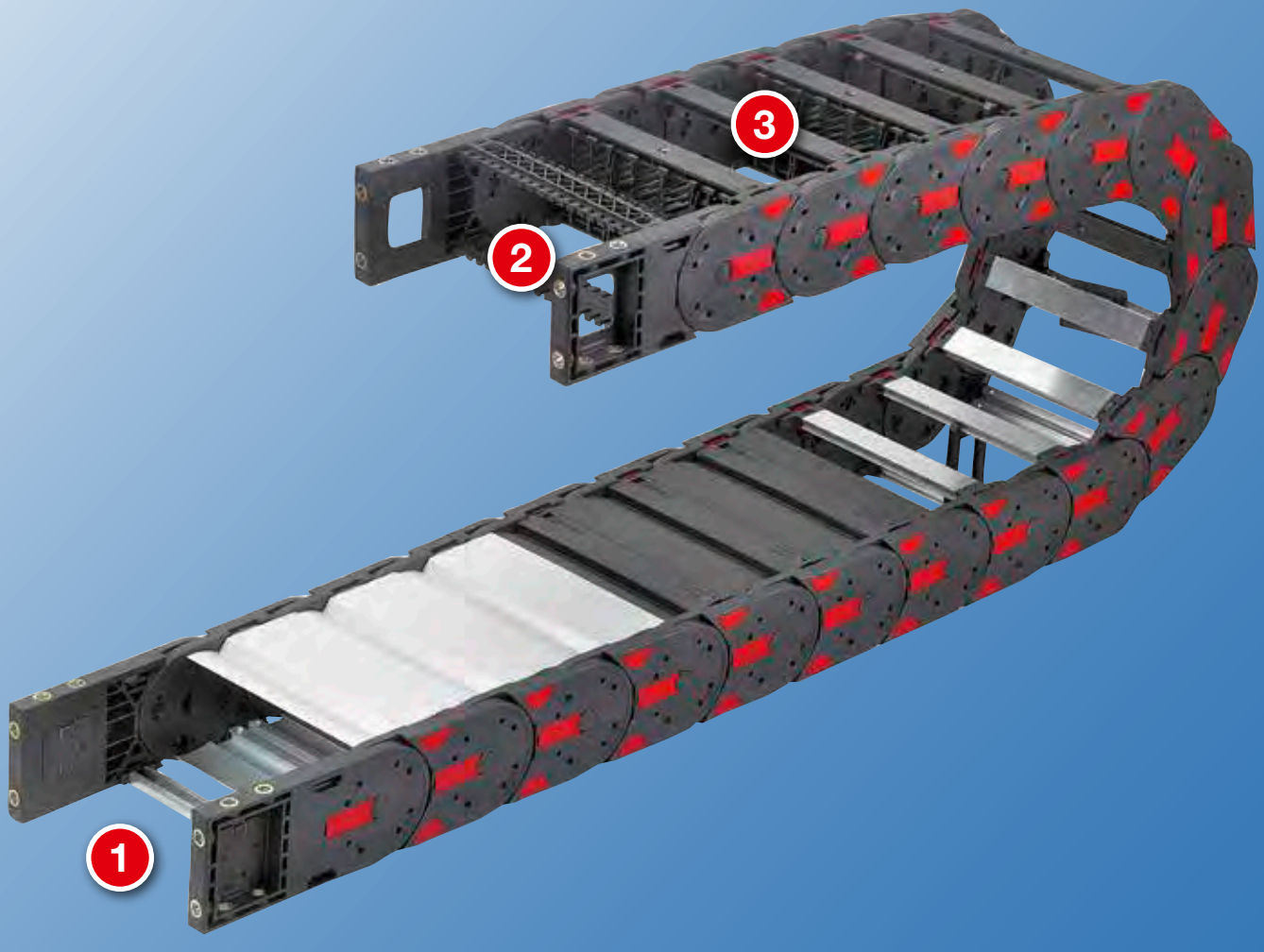
2 Strain relief

Frame bridge RS-ZL



STF Steel Fix

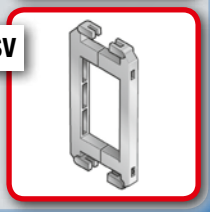




3 Shelving system

Separator TR

Frame bridge connector RSV

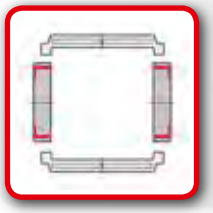


Guide channels

Aluminium VAW

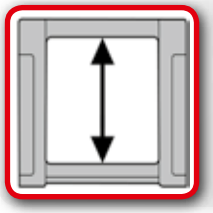
Stainless steel VAW-E

Technical data



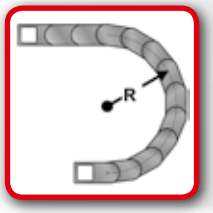
Loading side

inside and outside flexure curve



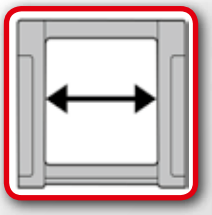
Available interior heights

82.0 mm



Available radii

150.0 – 650.0 mm



Available interior widths

118.0 – 518.0 mm

With aluminium frame bridge
118.0 – 600.0 mm

HeavyLine MP 82.2 MP 82.3

Ordering key

Type	Variation	Inside width mm	Outside width mm	Radius mm	Ridge version	Material
		118	163			
		143	188			
		168	213			
		193	238			
		218	263			
		243	288		0[1]	
		268	313	150[1]	1[1]	
		293	338	200	2[1]	
		318	363	250	3[1]	
		343	388	300	4	
		368	413	350	5	0
		418	463	400	6[1]	5[1]
0822	30	468[1]	513[1]	500	7[1]	7[1]
0823	44[2]	518[1]	563[1]	650	9[1]	9

Chain length mm

[1] for variant 30 only
[2] reduced inner height, reduced max. cable diameter, see chain link drawing (values in brackets)

Ordering key _ _ _ _   _ _   _ _ _   _ _ _   _   _   _ _ _ _ _ _

Note on configuration

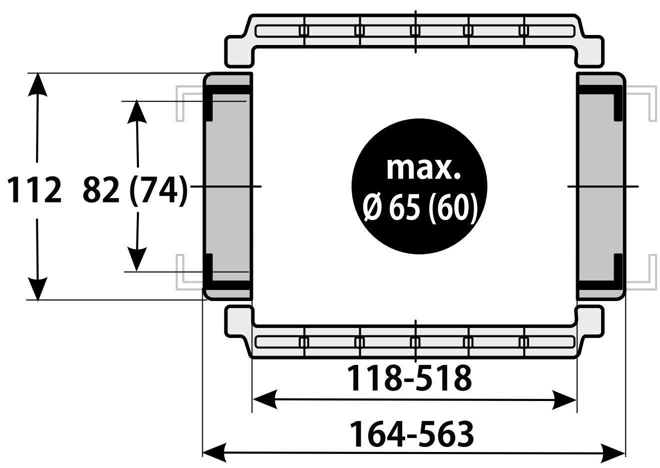
Frame bridges and cover from aluminium:
Aluminium frame bridges and covers can be supplied in 1 mm width sizes for inner widths from 118.0 mm – 600.0 mm.
If frame bridge strain relief plates (RS-ZL) are to be deployed, take standard widths into account.

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)
5 Polypropylene (PP/blue)
7 ESD (PA/light grey)
9 Special version

0 PA full-ridged with bias
1 PA full-ridged without bias
2 PA half-ridged with bias
3 PA half-ridged without bias
4 Aluminium full-ridged with bias
5 Aluminium full-ridged without bias
6 Aluminium half-ridged with bias
7 Aluminium half-ridged without bias
9 Special version

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

Order sample: 0822 30 118 150 0 0 1534
Frame bridge in outside bend, frame bridge in inside bend, can be opened from inside and outside bend
Inside width 118 mm; radius 150 mm
Plastic bridge, full-ridged with bias, material black-coloured polyamide
Chain length 1534 mm (13 links)

Technical specifications

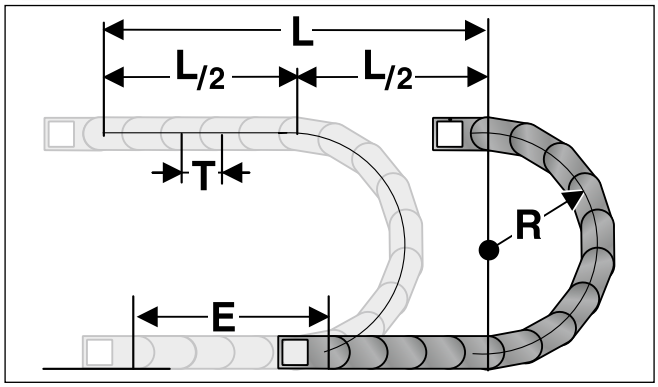
Travel distance gliding L_g max.:	150.0 m
Travel distance self-supporting L_f max.:	see diagram
Travel distance vertical, hanging L_{vh} max.:	80.0 m
Travel distance vertical, upright L_{vs} max.:	6.0 m
Rotated 90°, unsupported L_{90f} max.:	3.0 m
Speed, gliding V_g max.:	5.0 m/s
Speed, self-supporting V_f max.:	20.0 m/s
Acceleration, gliding a_g max.:	25.0 m/s²
Acceleration, self-supporting a_f max.:	40.0 m/s²

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:	UL 94 HB

Other material properties on request.

Determining the chain length

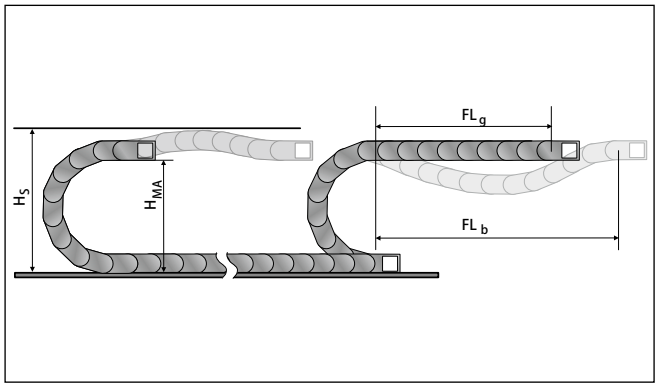


The fixed point of the cable drag chain should be connected in the middle of the travel distance.
This arrangement gives the shortest connection between the fixed point and the moving consumer and thus the most efficient chain length.

Chain length calculation = L/2 + π * R + E
≈ 1 m chain = 9 qty. x 118.0 mm links.

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

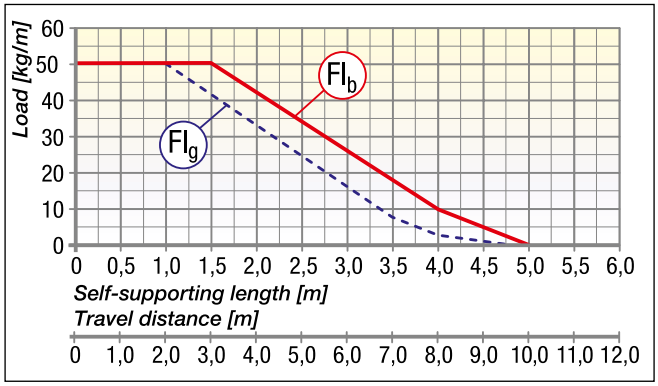
Self-supporting length



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

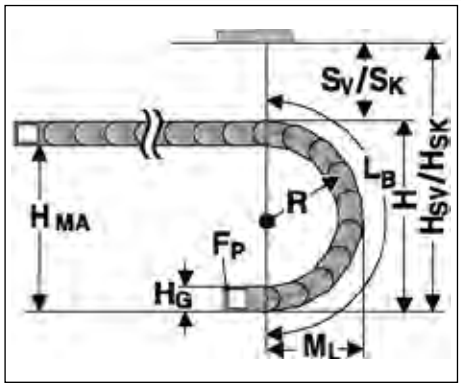
Load diagram for self-supporting applications



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

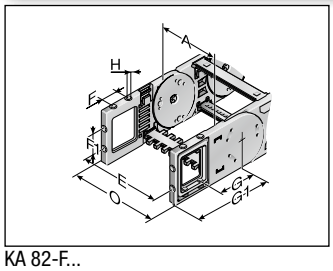
FL_b Self-supporting Length, upper run bent
In the FL_b range, the chain upper run has a sag of more than , but this is still less than the maximum sag.
Where the sag is greater than that permitted in the FL_b range, the application is critical and should be avoided. The self-supporting length can be optimized by using a support for the upper run or a more stable cable drag chain.
Closed cable drag chains (with covers) have a higher unit weight than open chains (with frame bridges). This higher weight must be taken into account when calculating the self-supporting length. To the weight of the cabling (cable load, in kg/m), you must add 3.1 kg/m, to account for the higher weight of closed-cover chains.

Installation dimensions



Radius R	150	200	250	300	350	400	500	650
Outside height of chain link (H_G)	112	112	112	112	112	112	112	112
Height of bend (H)	422	522	622	722	822	922	1122	1422
Height of moving end connection (H_{MA})	310	410	510	610	710	810	1010	1310
Safety margin with bias (S_V)	50	50	50	50	50	50	50	50
Installation height with bias (H_{SV})	472	572	672	772	872	972	1172	1472
Safety margin without bias (S_K)	30	30	30	30	30	30	30	30
Installation height without bias (H_{SK})	452	552	652	752	852	952	1152	1452
Arc projection (M_L)	329	379	429	479	529	579	679	829
Bend length (L_B)	781	938	1095	1252	1409	1566	1880	2351

Chain bracket flexible

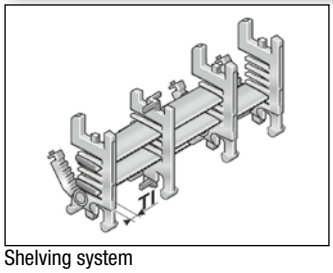


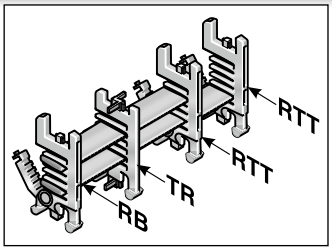
KA 82-F...

This chain bracket offers universal connection options (top, bottom and front) and is attached to the ends of the chain like a side link. This allows the chain to move right up to the bracket. Each chain requires one male and one female bracket. M10 screws are used to secure the brackets in place. Extrusion-coated metal bushes with either a through-hole (-FB) or a threaded hole (-FG) ensure the permanent, high-strength transmission of even extreme forces onto the cable drag chain.

Type	Order no.	Material	Version	Inside width A mm	E mm	F mm	F1 mm	G mm	G1 mm	H	HØ mm	Outside width KA O mm
KA 82-FB male	0820000056	Plastic	with bush	118.0 – 518.0	A+23.0	35.0	66.0	117.0	182.0		11.0	A+45.0
KA 82-FB female	0820000057	Plastic	with bush	118.0 – 518.0							11.0	A+45.0
KA 82-FG male	0820000058	Plastic	with thread	118.0 – 518.0						M10		A+45.0
KA 82-FG female	0820000059	Plastic	with thread	118.0 – 518.0						M10		A+45.0

Shelving system



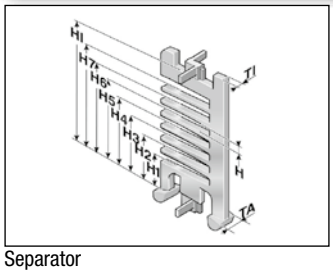


Shelving system

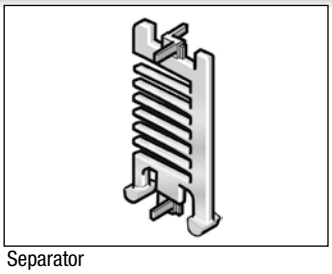
In connection with at least two shelf supports (RTT) the shelf becomes a shelving system. The additional levels prevent cables from criss-crossing and therefore destroying each other, while also avoiding excessive friction. The shelving system may be pre-assembled on request.

Type	Order no.	Designation	Width mm	Pitch mm	TI 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 82	100090822000	Shelf support, divisible		5.0	8.0

Separator



Separator

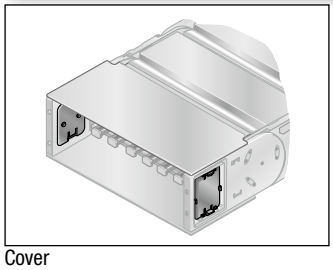


Separator

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	TI mm	H mm	H1 mm	H2 mm	H3 mm	H4 mm	H5 mm	H6 mm	H7 mm	HI mm
TR 82	082000009200	Separator	5.0	3.5	5.4	12.2	20.5	28.8	37.0	45.4	53.7	62.0	79.5

Cover chain bracket

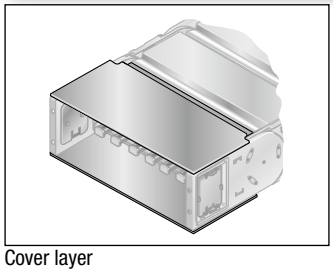


Cover

Self-locking covers close the side mounting window on the flexible chain bracket (KA-FB/FG).

Type	Order no.
Cover D8 KA 82.1-FB/FG	0823888002

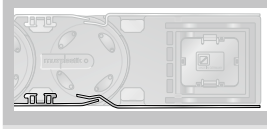
Cover chain bracket



Cover layer

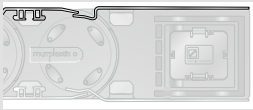
Constructed from aluminium, the canopies for the flexible chain bracket (KA-FB/FG) ensure a continuously closed system for chains with covers.

Canopy for: chain bracket, fixed point outside bend: Type and part number configurator



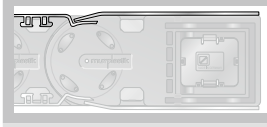
Type:	KA 82.1 FB/FG AB	Inside width	2-2
Order no.:	0821	Inside width	060

Cover for: Bracket fixed point inside bend: Type and part number configurator



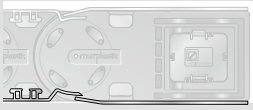
Type:	KA 82.1 FB/FG IB	Inside width	2-2
Order no.:	0821	Inside width	058

Cover for: Bracket moving end outside bend: Type and part number configurator



Type:	KA 82.1 FB/FG AB	Inside width	1-2
Order no.:	0821	Inside width	059

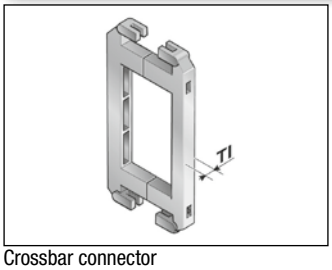
Cover for: Bracket moving end inside bend: Type and part number configurator



Type:	KA 82.1 FB/FG IB	Inside width	1-2
Order no.:	0821	Inside width	057

Sample order:
0821096058 KA 82.1 FB/FG IB 118 2-2
Chain bracket cover at fixing point in inner bend, for inner width of 118 mm.

Crossbar connector

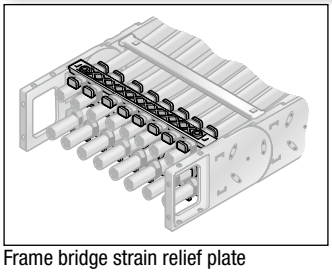


Crossbar connector

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 82	082000009600	Crossbar connector	8.0
RSV 82 Alu	082000009800	Crossbar connector for aluminium frame bridges	8.0

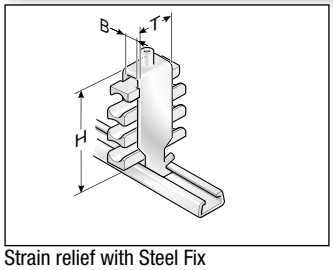
Frame bridge strain relief plate


Frame bridge strain relief plate

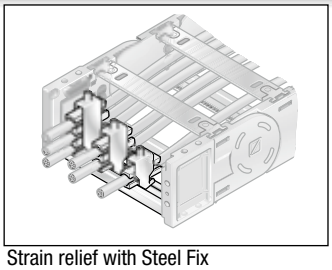
Fixed integrated frame bridge strain relief plates in the chain brackets. Accommodated to all widths of the frame bridges, up to 243 mm in size. May be assembled on the inside and outside flexure curves at both chain endings.

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
RS-ZL 243-7	072024300010	Frame bridge strain relief plate	243.0

Strain relief



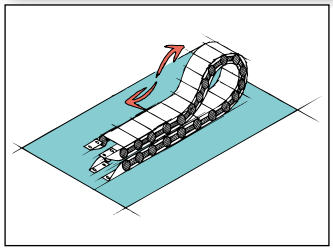
Strain relief with Steel Fix

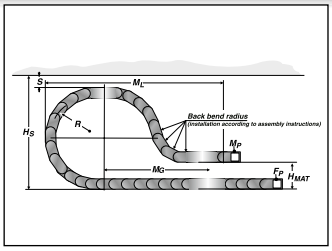

Strain relief with Steel Fix

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
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





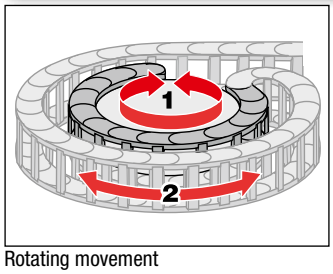
It is sometimes necessary to lower the height of the moving attachment point.

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

Please contact our application engineers.

Radius R mm	Height of moving end connection (H_{MAT}) mm	Safety margin (S) mm	Installation height incl. safety (H_S) mm	Projection (M_L) mm	Additional links qty.	of which additional back chain links qty.
200.0	240.0	60.0	582.0	900.0	8.0	2.0
250.0	260.0	60.0	682.0	1050.0	10.0	2.0
300.0	290.0	60.0	782.0	1130.0	11.0	2.0
400.0	420.0	60.0	962.0	1340.0	13.0	2.0
500.0	400.0	60.0	1182.0	1620.0	16.0	4.0

Back radii

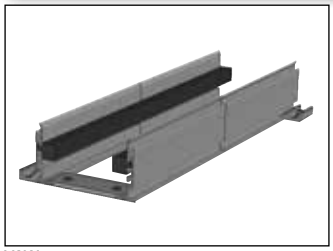


Rotating movement

Side links with radius forward (R) and radius backward (Rü) 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 82.2 (RÜ300/R300) left	082200030060	300.0	300.0
SR 82.2 (RÜ300/R300) right	082200030062	300.0	300.0

Guide channels (VAW)

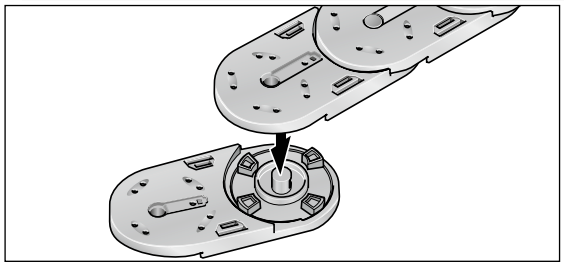


VAW

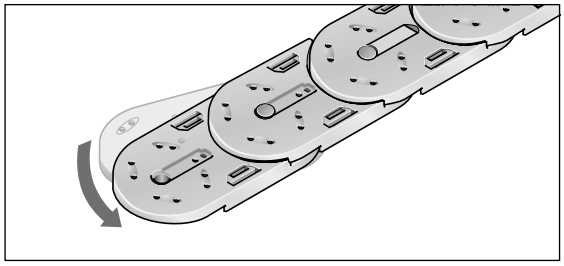
VAW-E

For this cable drag chain, a range of variable guide channel systems are available, constructed from aluminium or stainless steel 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“.

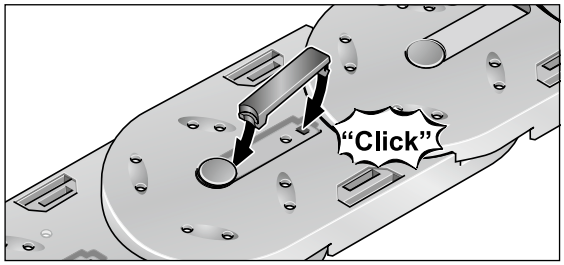
Assembly



Step 1



Step 2



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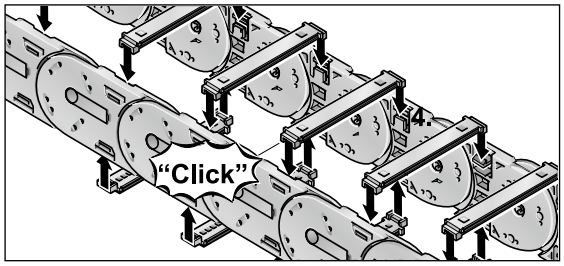

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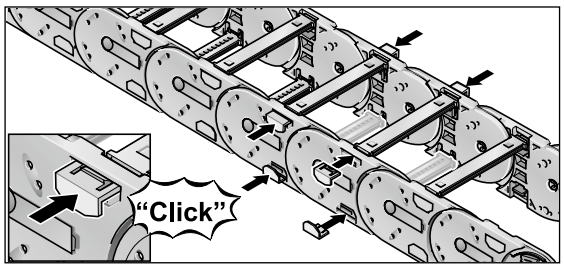
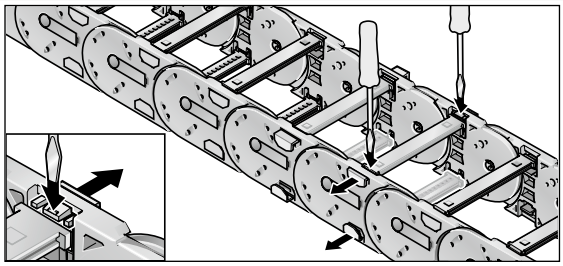
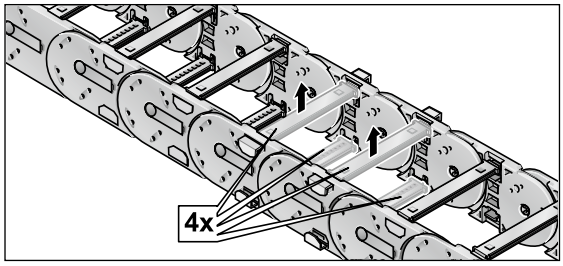


Step 5

Disassembly



Step 1



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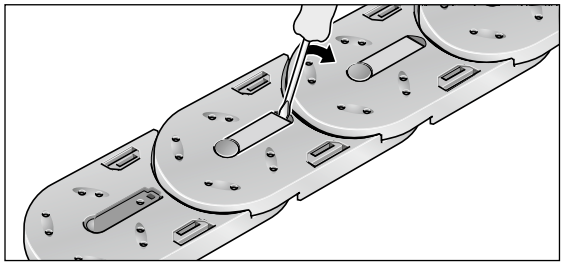
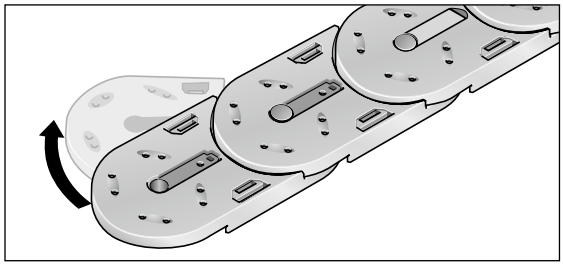
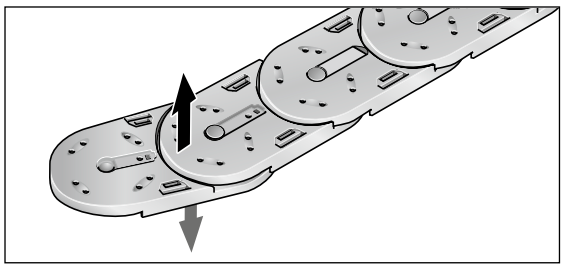


Step 3

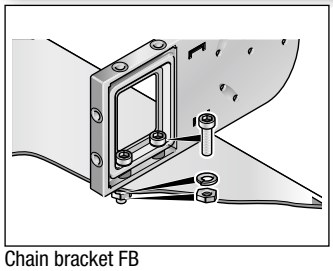


Step 4

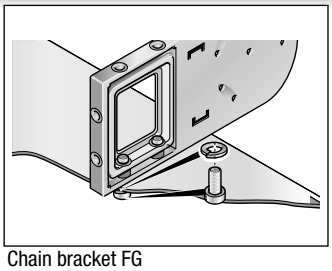


Step 5

Assembly instruction flexible chain bracket



Chain bracket FB



Chain bracket FG

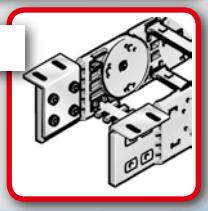
Brass bushes guarantee long-lasting fastening without cold flow in the plastic.

Version KA-FB:
Integrated through-hole fastened down using screw and nut.
Version KA-FG:
Built-in threads allow for quick and easy on-site mounting, since a screw, including a retaining washer where necessary, is sufficient.

System overview

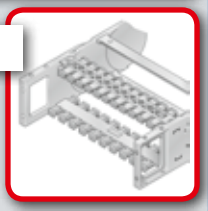
1 Chain bracket

Chain bracket angle

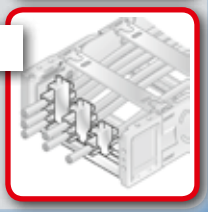


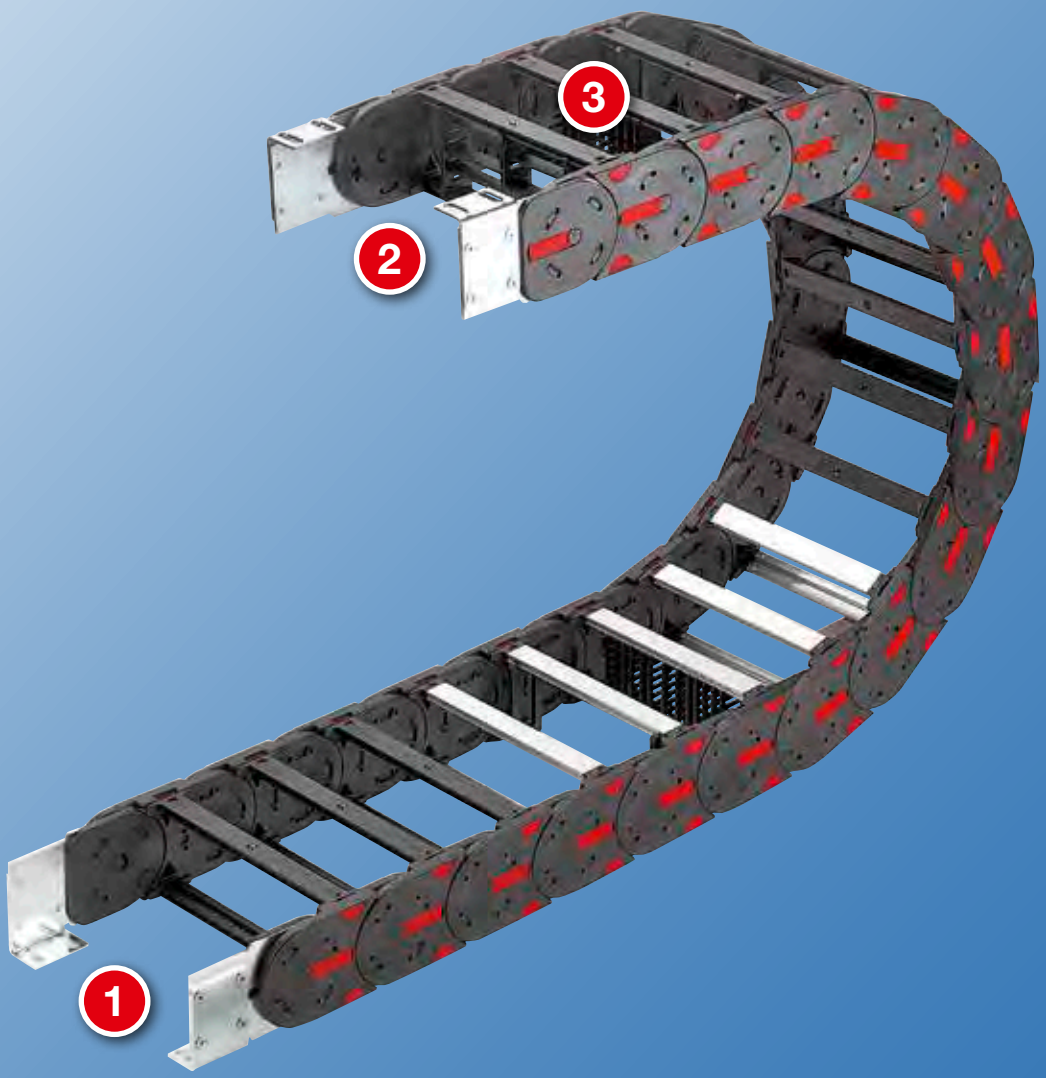
2 Strain relief

Frame bridge RS-ZL



STF Steel Fix

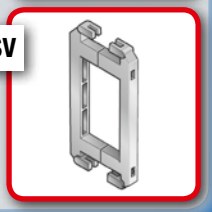




3 Shelving system

Separator TR

Frame bridge connector RSV

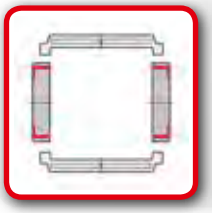


Guide channels

Aluminium VAW

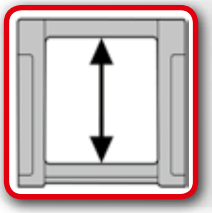
Stainless steel VAW-E

Technical data



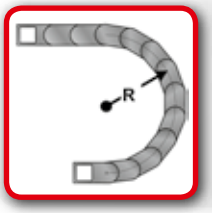
Loading side

inside and outside flexure curve



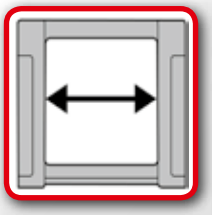
Available interior heights

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						
		Inside width mm	Outside width mm	Radius mm	Ridge version	Material	Chain length mm
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

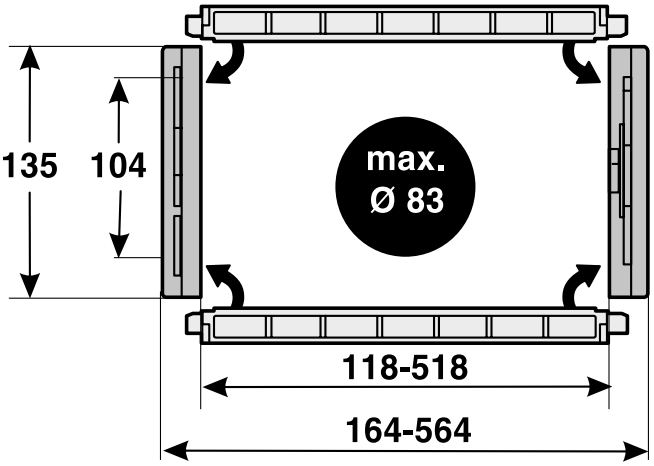
Frame bridges and cover from aluminium:
Aluminium frame bridges and covers can be supplied in 1 mm width sizes for inner widths from 118.0 mm – 600.0 mm.
If frame bridge strain relief plates (RS-ZL) are to be deployed, take standard widths into account.

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

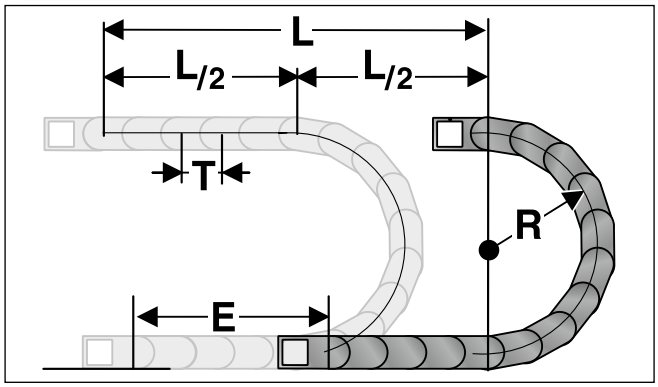
Travel distance gliding L_g max.:	150.0 m
Travel distance self-supporting L_f max.:	see diagram
Travel distance vertical, hanging L_{vh} max.:	80.0 m
Travel distance vertical, upright L_{vs} max.:	8.0 m
Rotated 90°, unsupported L_{90f} max.:	8.0 m
Speed, gliding V_g max.:	5.0 m/s
Speed, self-supporting V_f max.:	20.0 m/s
Acceleration, gliding a_g max.:	25.0 m/s²
Acceleration, self-supporting a_f max.:	40.0 m/s²

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

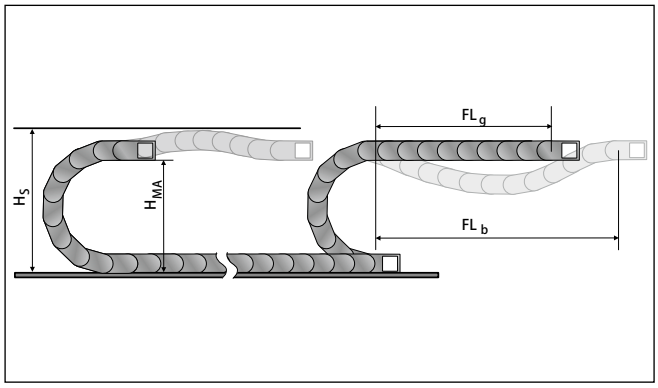


The fixed point of the cable drag chain should be connected in the middle of the travel distance.
This arrangement gives the shortest connection between the fixed point and the moving consumer and thus the most efficient chain length.

Chain length calculation = L/2 + π * R + E
≈ 1 m chain = 7 qty. x 141.0 mm links.

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

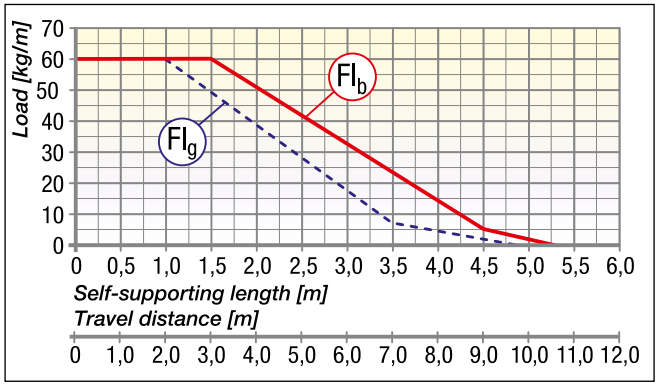
Self-supporting length



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

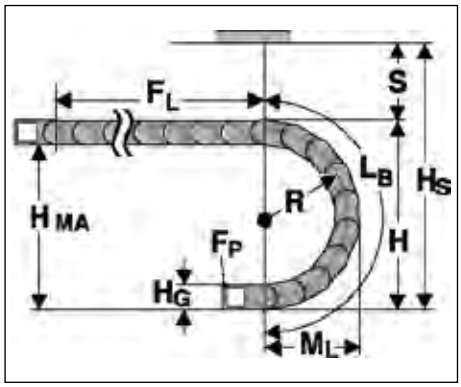
Load diagram for self-supporting applications



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

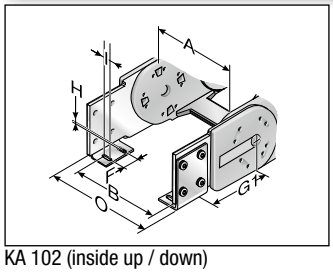
FL_b Self-supporting Length, upper run bent
In the FL_b range, the chain upper run has a sag of more than , but this is still less than the maximum sag.
Where the sag is greater than that permitted in the FL_b range, the application is critical and should be avoided. The self-supporting length can be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

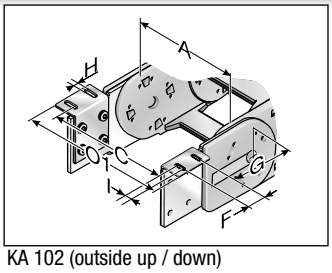
Installation dimensions

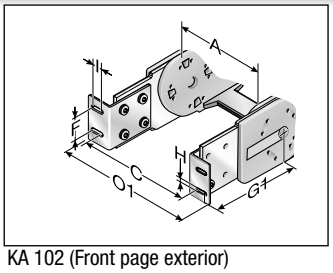


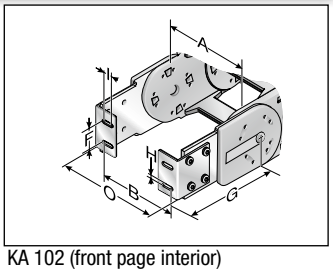
Radius R	250	300	400	500
Outside height of chain link (H_G)	135	135	135	135
Height of bend (H)	655	755	955	1155
Height of moving end connection (H_{MA})	520	620	820	1020
Installation height (H_S)	705	805	1005	1205
Safety margin (S)	50	50	50	50
Arc projection (M_L)	469	519	619	719
Bend length (L_B)	1169	1326	1640	1954

Chain bracket angle


KA 102 (inside up / down)


KA 102 (outside up / down)

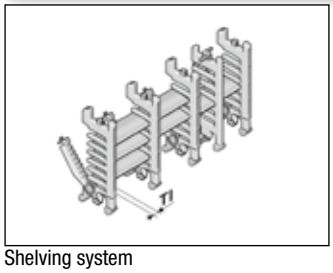

KA 102 (Front page exterior)

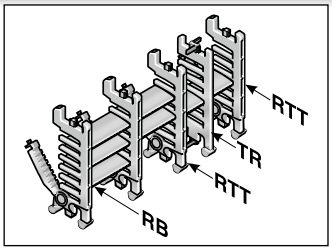

KA 102 (front page interior)

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 A mm	B mm	C mm	F mm	G mm	G1 mm	HØ mm	I mm	Outside width KA O mm	Outside width KA O1 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



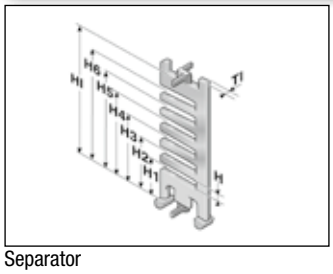


Shelving system

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	TI 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

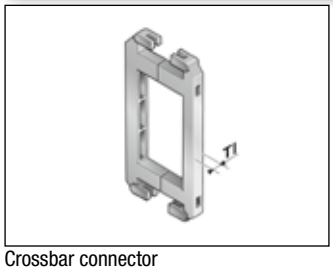


Separator

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	TI mm	H mm	H1 mm	H2 mm	H3 mm	H4 mm	H5 mm	H6 mm	HI 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

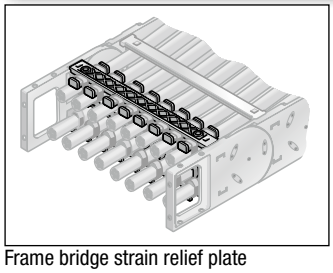


Crossbar connector

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	TI 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

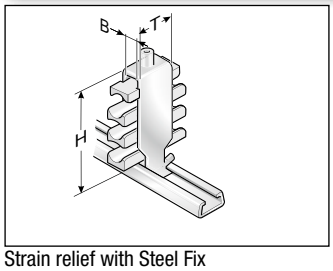


Frame bridge strain relief plate

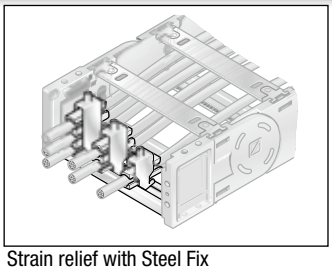
Fixed integrated frame bridge strain relief plates in the chain brackets. Accommodated to all widths of the frame bridges, up to 243 mm in size. May be assembled on the inside and outside flexure curves at both chain endings.

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

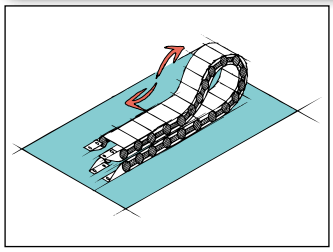
C-rails (cathodic dipped) for permanent integration, for accommodating the Steel Fix bow clamps in the chain brackets. The bow clamps can take up to 3 cables and are suitable for C-rails with a groove width of 11 mm. Due to the design of the trough elements a cable preserving cable guidance is ensured. 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.

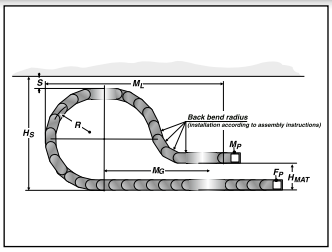
Type	Order no.	Designation	Ø mm	Seats qty.
Single clamp (for one cable)				
STF 12-1 Steel Fix	81661801	Hooped clamp	6.0 – 12.0	1
STF 14-1 Steel Fix	81661802	Hooped clamp	12.0 – 14.0	1
STF 16-1 Steel Fix	81661803	Hooped clamp	14.0 – 16.0	1
STF 18-1 Steel Fix	81661804	Hooped clamp	16.0 – 18.0	1
STF 20-1 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





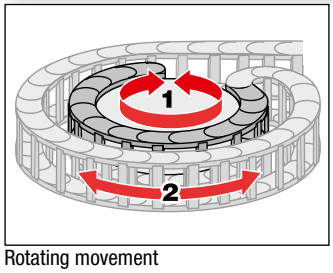
It is sometimes necessary to lower the height of the moving attachment point.

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

Please contact our application engineers.

Radius R mm	Height of moving end connection (H_{MAT}) mm	Safety margin (S) mm	Installation height incl. safety (H_S) mm	Projection (M_L) mm	Additional links qty.	of which additional back chain links 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

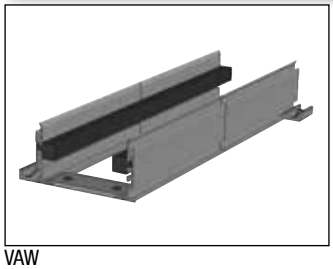


Rotating movement

Side links with radius forward (R) and radius backward (Rü) 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

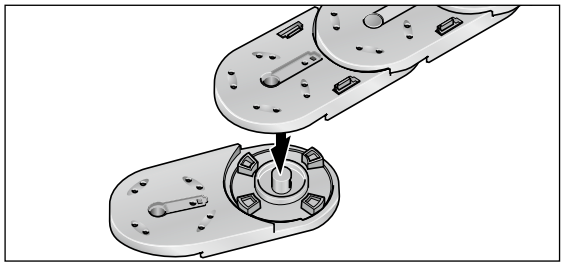
Guide channels (VAW)



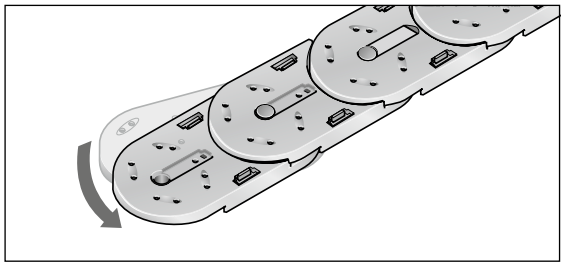
VAW

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“.

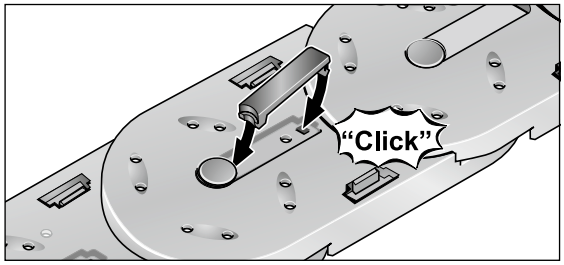
Assembly



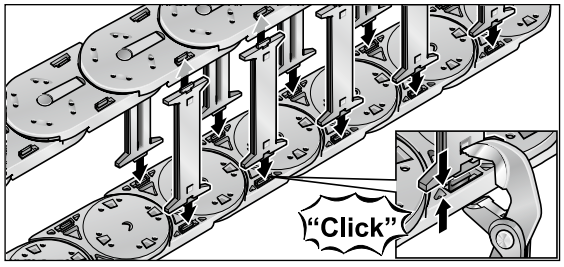
Step 1



Step 2

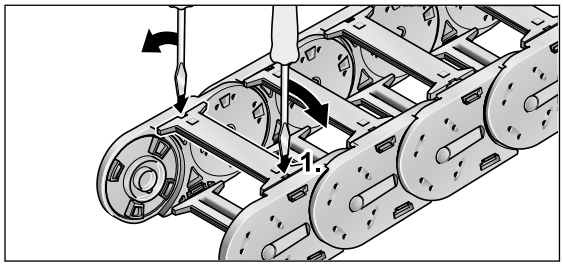


Step 3

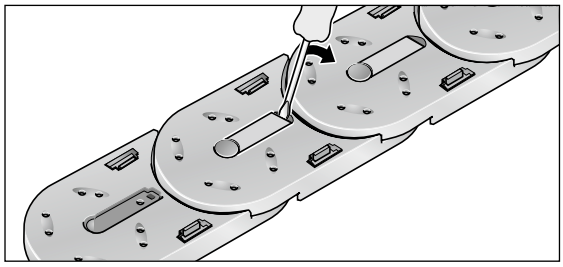


Step 4

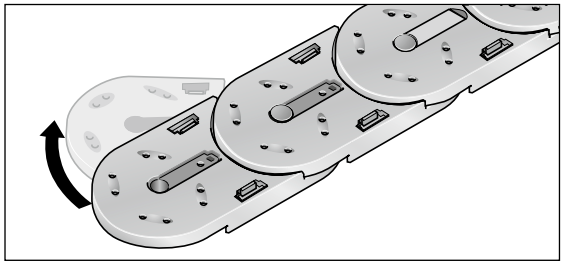
Disassembly



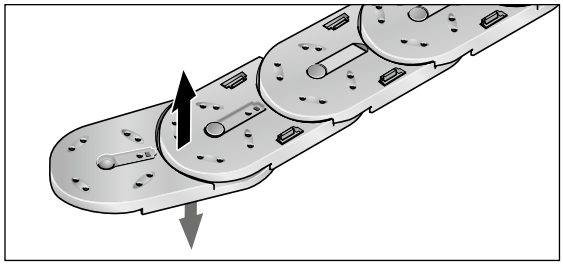
Step 1



Step 2



Step 3

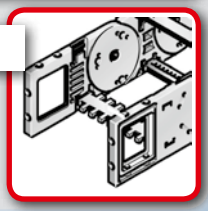


Step 4

System overview

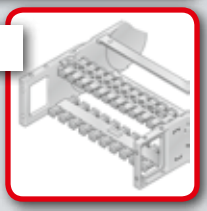
1 Chain bracket

Chain bracket flexible

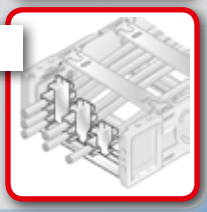


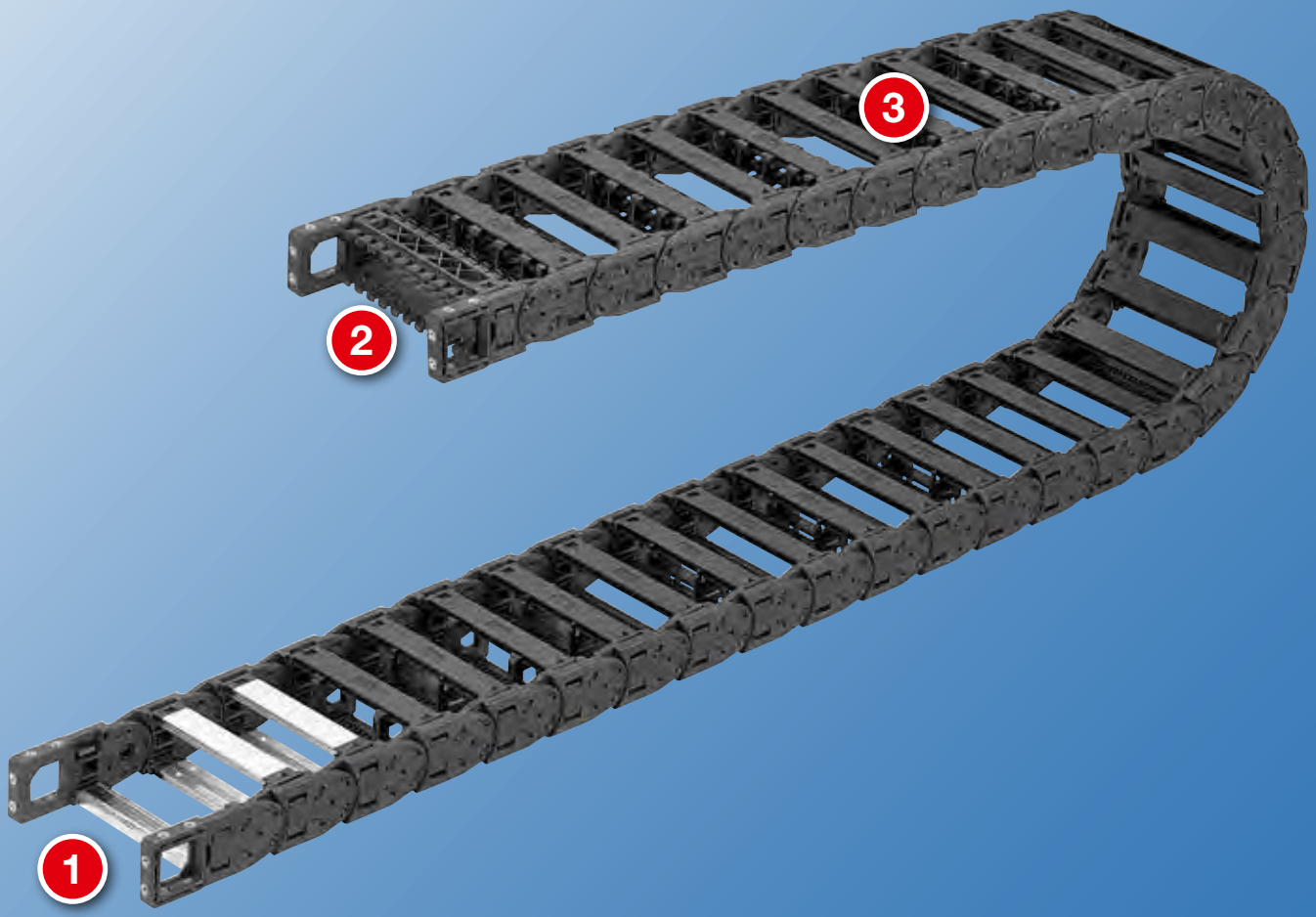
2 Strain relief

Frame bridge RS-ZL



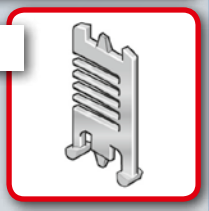
STF Steel Fix



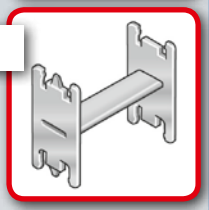


3 Shelving system

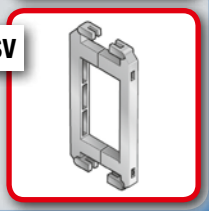
Separator TR



H-shaped shelf unit RE



Frame bridge connector RSV

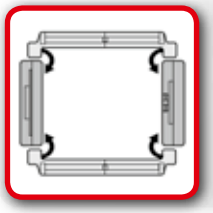


Guide channels

Aluminium VAW

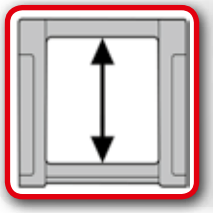
Stainless steel VAW-E

Technical data



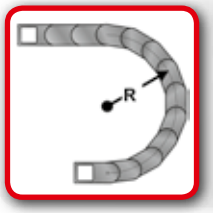
Loading side

inside and outside flexure curve



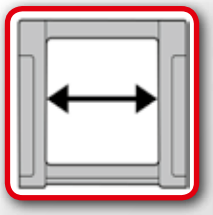
Available interior heights

32.0 mm



Available radii

80.0 – 250.0 mm



Available interior widths

45.0 – 546.0 mm

With aluminium frame bridge
80.0 – 600.0 mm

Ordering key

Type	Variation	Inside width mm	Outside width mm	Radius mm	Ridge version	Material	Chain length mm
		45	71				
		62	88				
		71	97				
		84	110				
		96	122				
		107	133				
		121	147				
		133	159				
		144	170				
		146	172				
		158	184				
		171	197				
		182	208				
		196	222				
		220	246				
		246	272				
		296	322				
		346	372	80			
		396	422	100	0		
		421	447	120	2		
		446	472	150	4		
		496	522	200	6	0	
0320	30	546	572	250	9	9	

Ordering key _ _ _ _   _ _   _ _ _   _ _ _   _   _   _ _ _ _ _ _

Note on configuration

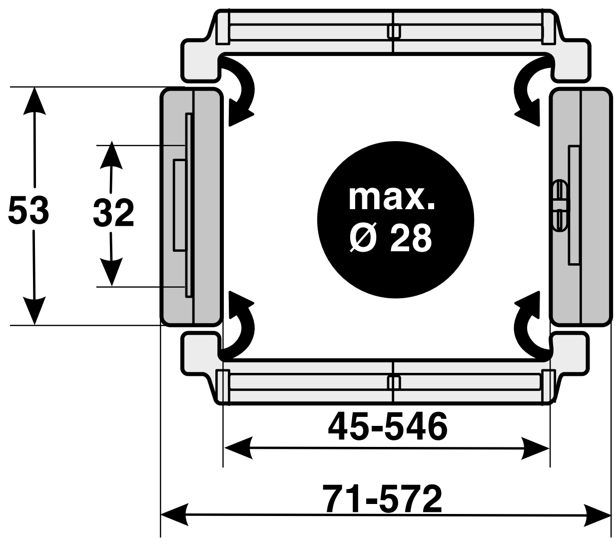
Frame bridges and cover from aluminium:
Aluminium frame bridges and covers can be supplied in 1 mm width sizes for inner widths from 80.0 mm – 600.0 mm.
If frame bridge strain relief plates (RS-ZL) are to be deployed, take standard widths into account.

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: 0320 30 045 080 0 0 1290
Frame bridge in outside bend, frame bridge in inside bend, can be opened from inside and outside bend
Inside width 45 mm; radius 80 mm
Plastic bridge, full-ridged with bias, material black-coloured polyamide
Chain length 1290 mm (20 links)

Technical specifications

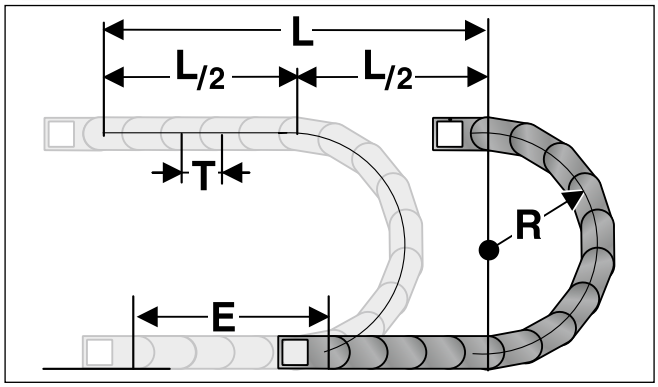
Travel distance gliding L_g max.:	100.0 m
Travel distance self-supporting L_f max.:	see diagram
Travel distance vertical, hanging L_{vh} max.:	40.0 m
Travel distance vertical, upright L_{vs} max.:	5.0 m
Rotated 90°, unsupported L_{90f} max.:	2.0 m
Speed, gliding V_g max.:	5.0 m/s
Speed, self-supporting V_f max.:	20.0 m/s
Acceleration, gliding a_g max.:	25.0 m/s²
Acceleration, self-supporting a_f max.:	30.0 m/s²

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:	UL 94 HB

Other material properties on request.

Determining the chain length

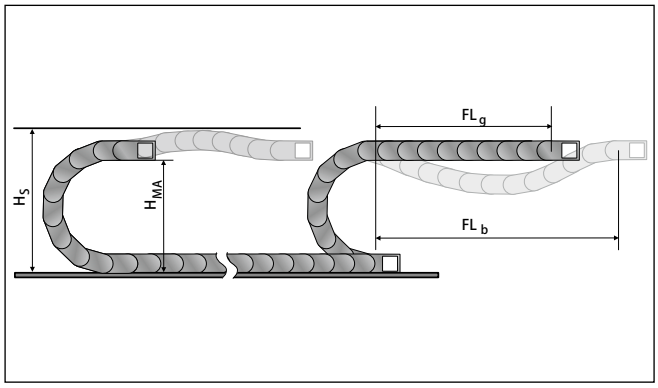


The fixed point of the cable drag chain should be connected in the middle of the travel distance.
This arrangement gives the shortest connection between the fixed point and the moving consumer and thus the most efficient chain length.

Chain length calculation = L/2 + π * R + E
≈ 1 m chain = 16 qty. x 64.5 mm links.

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

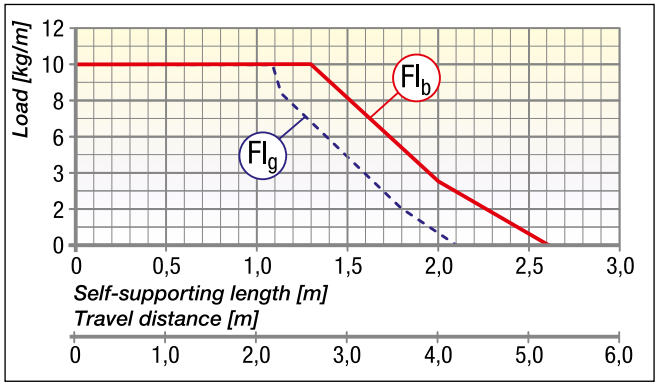
Self-supporting length



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

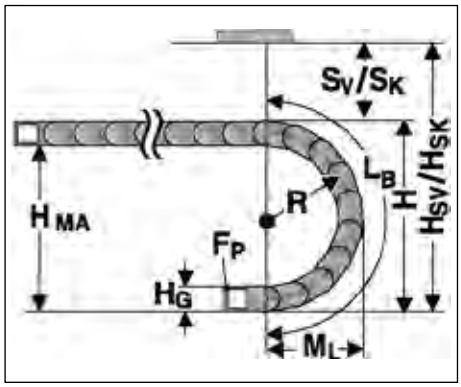
Load diagram for self-supporting applications



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

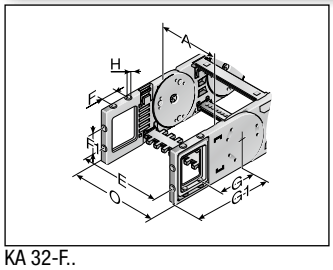
FL_b Self-supporting Length, upper run bent
In the FL_b range, the chain upper run has a sag of more than , but this is still less than the maximum sag.
Where the sag is greater than that permitted in the FL_b range, the application is critical and should be avoided. The self-supporting length can be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

Installation dimensions



Radius R	80	100	120	150	200	250
Outside height of chain link (H_G)	53	53	53	53	53	53
Height of bend (H)	233	273	313	373	473	573
Height of moving end connection (H_{MA})	180	220	260	320	420	520
Safety margin (S)	30	30	30	30	30	30
Installation height (H_S)	263	303	343	403	503	603
Arc projection (M_L)	181	201	221	251	301	351
Bend length (L_B)	430	493	556	650	807	964

Chain bracket flexible

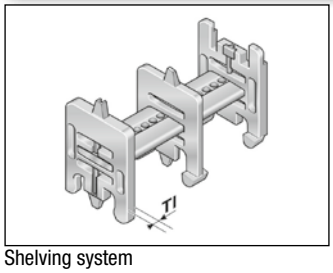


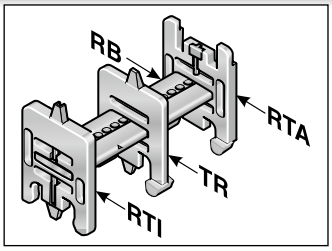
KA 32-F..

This chain bracket offers universal connection options (top, bottom and front) and is attached to the ends of the chain like a side link. This allows the chain to move right up to the bracket. Each chain requires one male and one female bracket. M5 screws are used to secure the brackets in place. Extrusion-coated metal bushes with either a through-hole (-FB) or a threaded hole (-FG) ensure the permanent, high-strength transmission of even extreme forces onto the cable drag chain.

Type	Order no.	Material	Version	Inside width A mm	E mm	F mm	F1 mm	G mm	G1 mm	H	HØ mm	Outside width KA O mm
KA 32-FB	0321000054	Plastic	with bush	45.0 – 546.0	A+14.0	22.5	22.0	57.8	95.5		5.5	A+28.0
KA 32-FG	0321000055	Plastic	with thread	45.0 – 546.0	A+14.0	22.5	22.0	57.8	95.5	M5		A+28.0

Shelving system



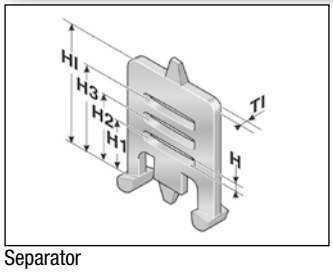


Shelving system

In connection with at least two shelf supports (RTI/RTA) the shelf becomes a shelving system. The additional levels prevent cables from criss-crossing and therefore destroying each other, whilst also avoiding excessive friction. The shelving system may be pre-assembled on request. RTA shelving supports must be placed externally inside the internal chain compartment. RTI shelving supports must be placed at the inside centre of the internal chain compartment if the shelving system does not run throughout the entire width.

Type	Order no.	Designation	Width mm	Pitch mm	TI mm
RB 031	100000003100	Shelf	31.0	5.6	
RB 048	100000004800	Shelf	48.0	5.6	
RB 070	100000007000	Shelf	70.0	5.6	
RB 092	100000009200	Shelf	92.0	5.6	
RB 100	100000010000	Shelf	100.0	5.6	
RB 128	100000012800	Shelf	128.0	5.6	
RB 167	100000016700	Shelf	167.0	5.6	
RB 218	100000021800	Shelf	218.0	5.6	
RTA 32	1000910100	Shelf support, exterior, incl. pin		5.6	6.0
RTI 32	1000911100	Shelf support, interior, incl. pin		5.6	6.0

Separator

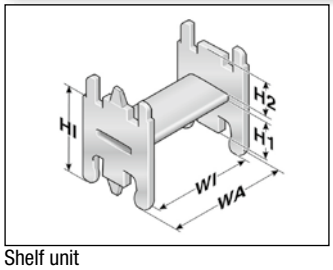


Separator

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	TI mm	H mm	H1 mm	H2 mm	H3 mm	HI mm
TR 32	032000009200	Separator	5.6	3.0	4.2	10.4	16.2	22.0	32.4

Shelf unit



Shelf unit

Insert to obtain additional levels in pre-defined window distances.

Type	Order no.	Designation	Pitch mm	WA mm	WI mm	H1 mm	H2 mm	HI mm
RE 32/35	100000322010	H-shaped shelf unit	5.6	43.2	35.2	14.2	14.2	32.4
RE 32/52	100000323510	H-shaped shelf unit	5.6	60.0	52.0	14.2	14.2	32.4
RE 32/75	100000327510	H-shaped shelf unit	5.6	82.4	74.4	16.4	12.0	32.4

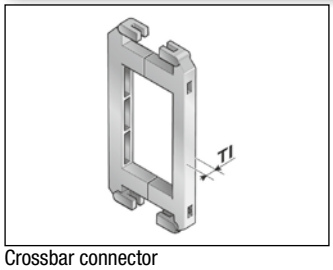
Bracket bar

Bracket bar

Large-diameter conduits are routed securely by using a bracket bar (BS). This bar is installed on the frame bridges or the covers of the cable drag chain.
The bracket bar can be installed on both the inside and outside bend.
The bracket bar support (BSH) is used to attach the bars to PowerLine series frame bridges. Two bracket bar supports are required for each bar.

Type	Order no.	Designation	Conduit diameter max. mm	Installation height (EH) mm	Inner chain width min. mm
BS 120-5	052412000000	Bracket bar	115.0	140.0	171.0
BS 153-5	052415300000	Bracket bar	148.0	170.0	220.0
BS 187-5	052418700000	Bracket bar	182.0	205.0	246.0
BSH-5	052400000000	Bracket bar support			

Crossbar connector

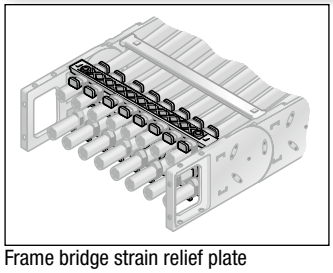


Crossbar connector

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 32	032000009600	Crossbar connector	7.5
RSV 32 Alu	032000009800	Crossbar connector for aluminium frame bridges	7.5

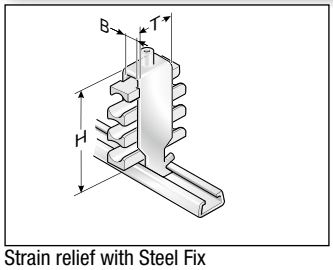
Frame bridge strain relief plate


Frame bridge strain relief plate

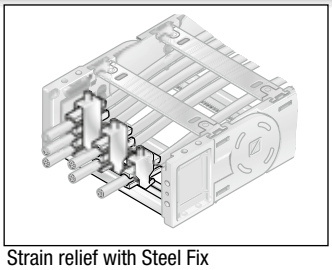
Fixed integrated frame bridge strain relief plates in the chain brackets. Tailored to all frame bridge widths up to 246 mm. May be assembled on the inside and outside bends at both chain endings.

Type	Order no.	Designation	Note	For internal width mm
RS-ZL 045-5	052004500010	Frame bridge strain relief plate		45.0
RS-ZL 062-5	052006200010	Frame bridge strain relief plate		62.0
RS-ZL 071-5	052007100010	Frame bridge strain relief plate		71.0
RS-ZL 084-5	052008400010	Frame bridge strain relief plate		84.0
RS-ZL 096-5	052009600010	Frame bridge strain relief plate		96.0
RS-ZL 107-5	052010700010	Frame bridge strain relief plate		107.0
RS-ZL 121-5	052012100010	Frame bridge strain relief plate		121.0
RS-ZL 133-5	052013300010	Frame bridge strain relief plate		133.0
RS-ZL 144/146-5	052014400010	Frame bridge strain relief plate	also for internal width 146 mm	144.0
RS-ZL 158-5	052015800010	Frame bridge strain relief plate		158.0
RS-ZL 171-5	052017100010	Frame bridge strain relief plate		171.0
RS-ZL 182-5	052018200010	Frame bridge strain relief plate		182.0
RS-ZL 196-5	052019600010	Frame bridge strain relief plate		196.0
RS-ZL 220-5	052022000010	Frame bridge strain relief plate		220.0
RS-ZL 246-5	052024600010	Frame bridge strain relief plate		246.0

Strain relief



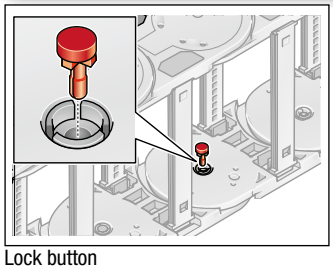
Strain relief with Steel Fix

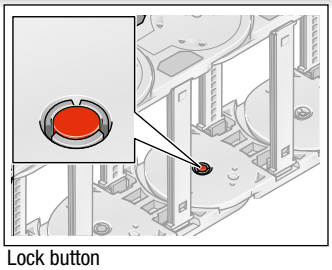

Strain relief with Steel Fix

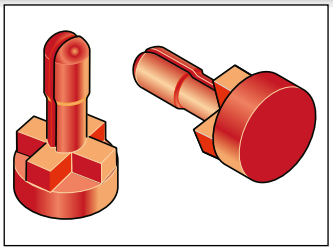
C-rails (cathodic dipped) for permanent integration, for accommodating the Steel Fix bow clamps in the chain brackets. The bow clamps can take up to 3 cables and are suitable for C-rails with a groove width of 11 mm. Due to the design of the trough elements a cable preserving cable guidance is ensured. 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
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

Lock button


Lock button

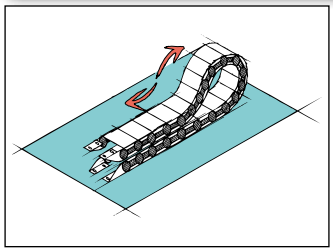

Lock button

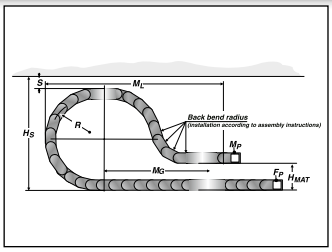


To increase the side stability, we recommend the use of lock buttons during strong lateral acceleration or when installed „laying on the side (turned 90°) without support“.

Type	Order no.
MP32/41 lock button	041000008000

Lowered fixing point





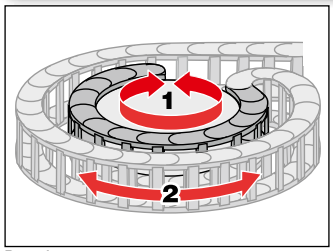
It is sometimes necessary to lower the height of the moving attachment point.

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

Please contact our application engineers.

Radius R mm	Height of moving end connection (H_{MAT}) mm	Safety margin (S) mm	Installation height incl. safety (H_S) mm	Projection (M_L) mm	Additional links qty.	of which additional back chain links qty.
200.0	210.0	50.0	523.0	720.0	14.0	3.0
250.0	230.0	50.0	623.0	880.0	17.0	3.0

Back radii

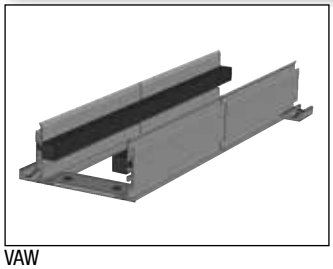


Rotating movement

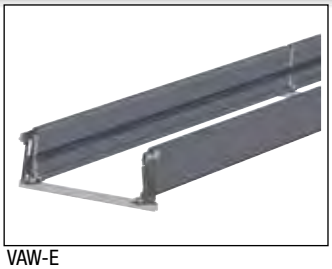
Side links with radius forward (R) and radius backward (Rü) allow for movement in two directions. This is intended for rotating movements and lowered chain brackets.

Type	Order no.	Radius mm	Back radius mm
SR 32 (RÜ200/R120)	032000008060	120.0	200.0
SR 32 (RÜ200/R135)	032000010060	135.0	200.0
SR 32 (RÜ200/R150)	032000012060	150.0	200.0
SR 32 (RÜ200/R170)	032000015060	170.0	200.0
SR 32 (RÜ200/R200)	032000020060	200.0	200.0
SR 32 (RÜ200/R250)	032000025060	250.0	200.0

Guide channels (VAW)



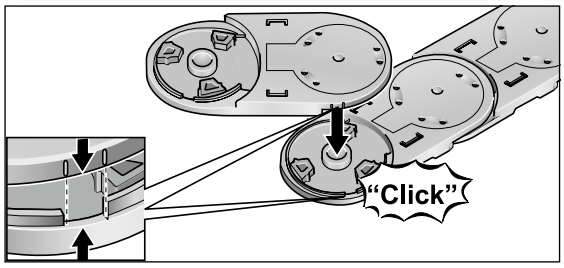
VAW



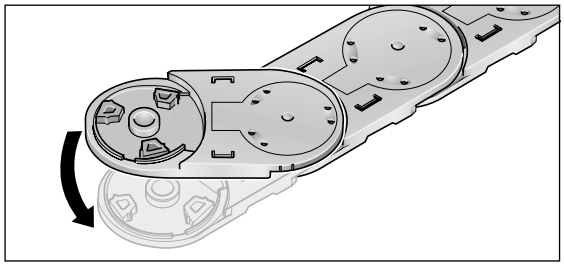
VAW-E

For this cable drag chain, a range of variable guide channel systems are available, constructed from aluminium or stainless steel 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“.

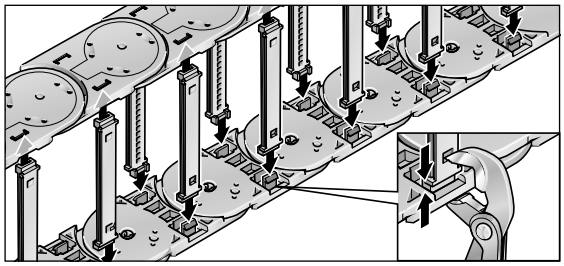
Assembly



Step 1

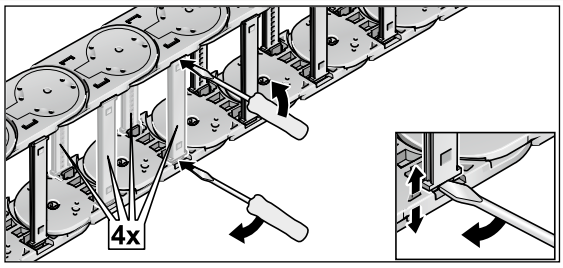


Step 2

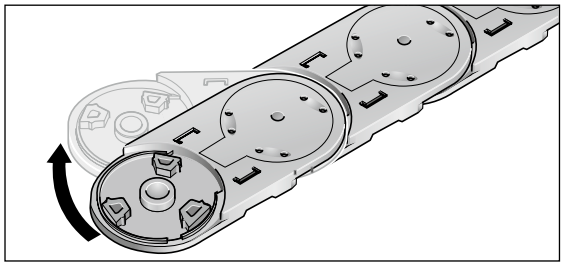


Step 3

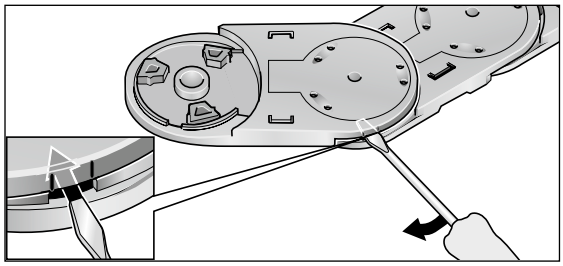
Disassembly



Step 1

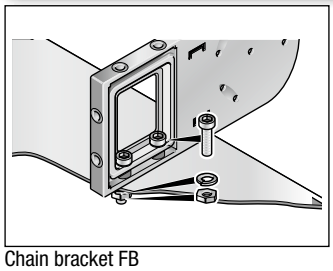


Step 2

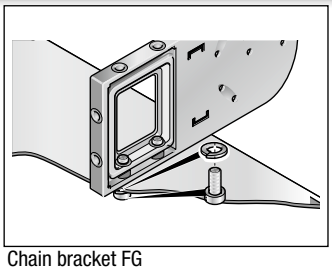


Step 3

Assembly instruction flexible chain bracket



Chain bracket FB



Chain bracket FG

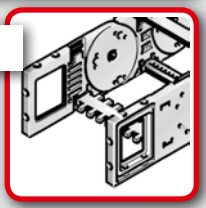
Brass bushes guarantee long-lasting fastening without cold flow in the plastic.

Version KA-FB:
Integrated through-hole fastened down using screw and nut.
Version KA-FG:
Built-in threads allow for quick and easy on-site mounting, since a screw, including a retaining washer where necessary, is sufficient.

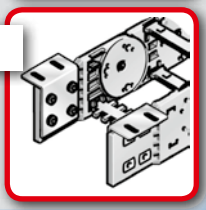
System overview

1 Chain bracket

Chain bracket flexible

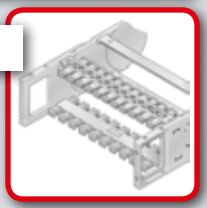


Chain bracket angle

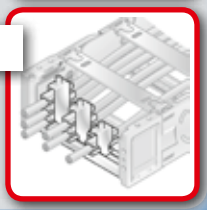


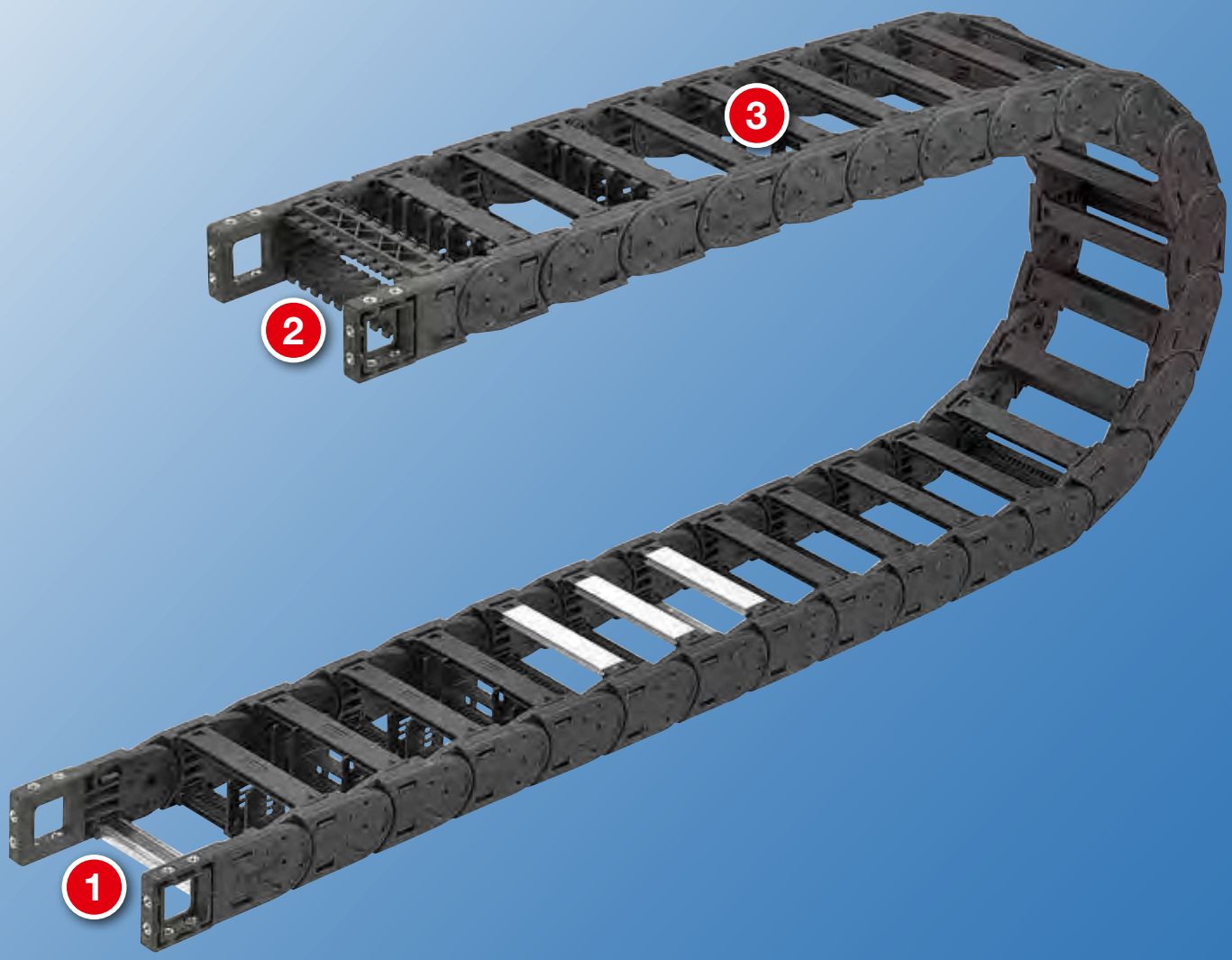
2 Strain relief

Frame bridge RS-ZL



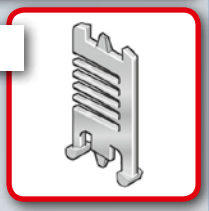
STF Steel Fix



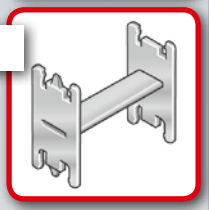


3 Shelving system

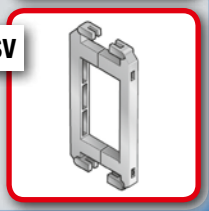
Separator TR



H-shaped shelf unit RE



Frame bridge connector RSV

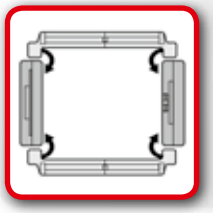


Guide channels

Aluminium VAW

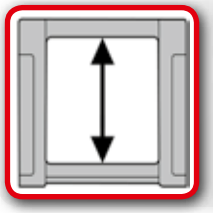
Stainless steel VAW-E

Technical data



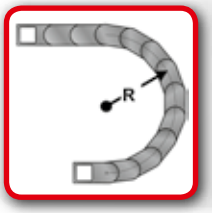
Loading side

inside and outside flexure curve



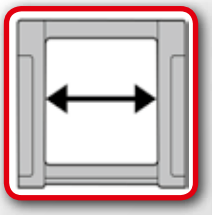
Available interior heights

42.0 mm



Available radii

90.0 – 350.0 mm



Available interior widths

45.0 – 546.0 mm

With aluminium frame bridge
80.0 – 600.0 mm

Ordering key

Type	Variation						
		Inside width mm	Outside width mm	Radius mm	Ridge version	Material	Chain length mm
0410	30	45 62 71 84 96 107 121 133 144 146 158 171 182 196 220 246 296 346 396 421 446 496 546	77 94 103 116 128 139 153 165 176 178 190 203 214 228 252 278 328 378 428 453 478 528 578	90 120 150 200 250 300 350	0 2 4 6 9	0 9	

Ordering key

Note on configuration

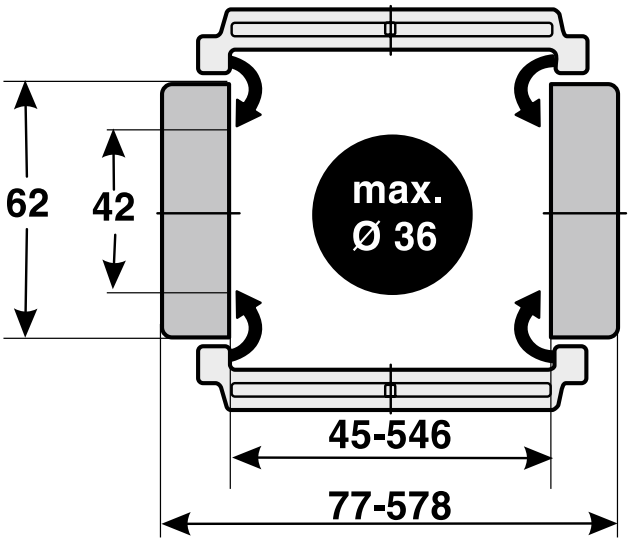
Frame bridges and cover from aluminium:
Aluminium frame bridges and covers can be supplied in 1 mm width sizes for inner widths from 80.0 mm – 600.0 mm.
If frame bridge strain relief plates (RS-ZL) are to be deployed, take standard widths into account.

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: 0410 30 045 090 0 0 1386
Frame bridge in outside bend, frame bridge in inside bend, can be opened from inside and outside bend
Inside width 45 mm; radius 90 mm
Plastic bridge, full-ridged with bias, material black-coloured polyamide
Chain length 1386 mm (18 links)

Technical specifications

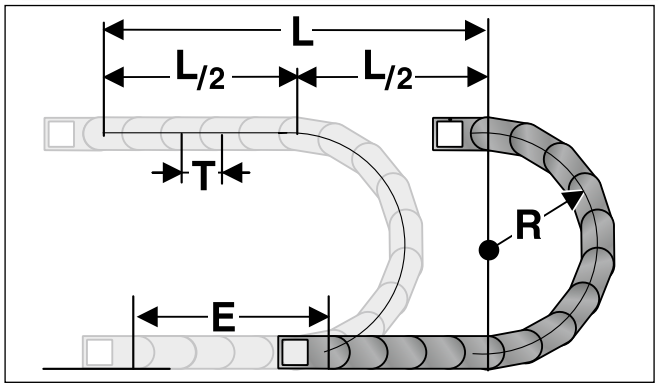
Travel distance gliding L_g max.:	120.0 m
Travel distance self-supporting L_f max.:	see diagram
Travel distance vertical, hanging L_{vh} max.:	50.0 m
Travel distance vertical, upright L_{vs} max.:	6.0 m
Rotated 90°, unsupported L_{90f} max.:	2.0 m
Speed, gliding V_g max.:	5.0 m/s
Speed, self-supporting V_f max.:	20.0 m/s
Acceleration, gliding a_g max.:	25.0 m/s²
Acceleration, self-supporting a_f max.:	30.0 m/s²

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:	UL 94 HB

Other material properties on request.

Determining the chain length

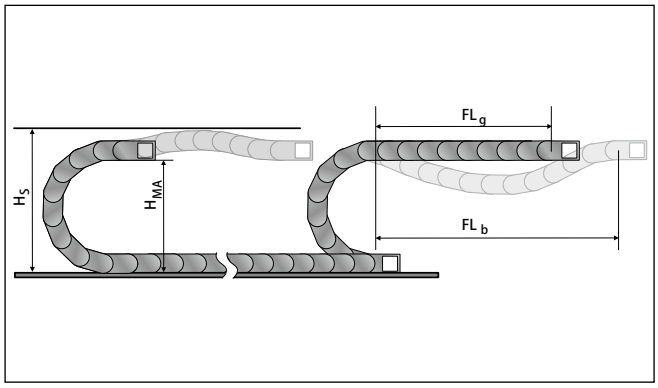


The fixed point of the cable drag chain should be connected in the middle of the travel distance.
This arrangement gives the shortest connection between the fixed point and the moving consumer and thus the most efficient chain length.

Chain length calculation = L/2 + π * R + E
≈ 1 m chain = 13 qty. x 77.0 mm links.

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

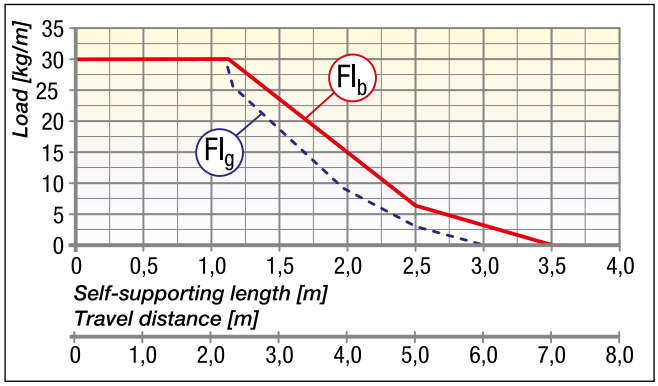
Self-supporting length



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

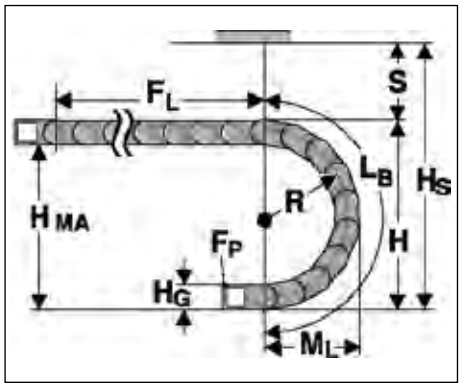
Load diagram for self-supporting applications



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

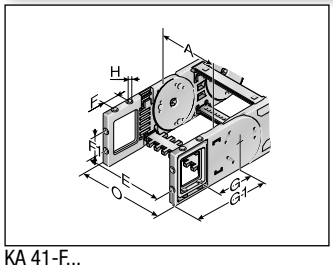
FL_b Self-supporting Length, upper run bent
In the FL_b range, the chain upper run has a sag of more than , but this is still less than the maximum sag.
Where the sag is greater than that permitted in the FL_b range, the application is critical and should be avoided. The self-supporting length can be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

Installation dimensions



Radius R	90	120	150	200	250	300	350
Outside height of chain link (H_G)	62	62	62	62	62	62	62
Height of bend (H)	252	312	372	472	572	672	772
Height of moving end connection (H_{MA})	190	250	310	410	510	610	710
Safety margin (S)	30	30	30	30	30	30	30
Installation height (H_S)	282	342	402	502	602	702	802
Arc projection (M_L)	203	233	263	313	363	413	463
Bend length (L_B)	473	567	661	818	975	1132	1289

Chain bracket flexible

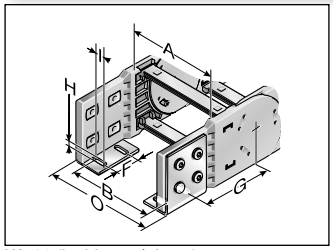


KA 41-F...

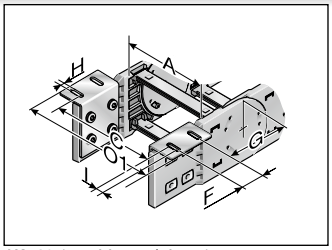
This chain bracket offers universal connection options (top, bottom and front) and is attached to the ends of the chain like a side link. This allows the chain to move right up to the bracket. Each chain requires one male and one female bracket. M6 screws are used to secure the brackets in place. Extrusion-coated metal bushes with either a through-hole (-FB) or a threaded hole (-FG) ensure the permanent, high-strength transmission of even extreme forces onto the cable drag chain.

Type	Order no.	Material	Version	Inside width A mm	E mm	F mm	F1 mm	G mm	G1 mm	H	HØ mm	Outside width KA O mm
KA 41-FB	0411000054	Plastic	with bush	45.0 – 546.0	A+20.0	22.5	22.0	79.0	120.0		6.5	A+34.0
KA 41-FG	0411000055	Plastic	with thread	45.0 – 546.0	A+20.0	22.5	22.0	79.0	120.0	M6		A+34.0

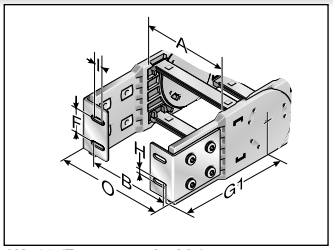
Chain bracket angle



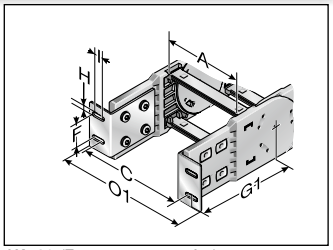
KA 41 (inside up / down)



KA 41 (outside up / down)



KA 41 (Front page inside)

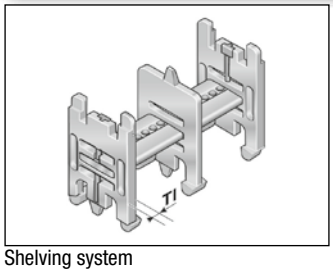


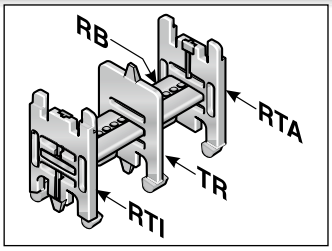
KA 41 (Front page exterior)

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 two chain brackets. The brackets should be fastened with M6 screws.

Type	Order no.	Material	Inside width A mm	B mm	C mm	F mm	G mm	G1 mm	HØ mm	Outside width KA O mm	Outside width KA O1 mm
KA 41	0410000051	Sheet steel	45.0 – 546.0	A-2.5	A+34.5	32.0	79.0	125.7	6.5	A+32.0	A+71.0

Shelving system



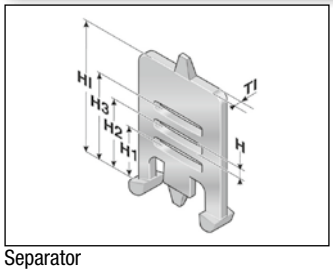


Shelving system

In connection with at least two shelf supports (RTI/RTA) the shelf becomes a shelving system. The additional levels prevent cables from criss-crossing and therefore destroying each other, whilst also avoiding excessive friction. The shelving system may be pre-assembled on request. RTA shelving supports must be placed externally inside the internal chain compartment. RTI shelving supports must be placed at the inside centre of the internal chain compartment if the shelving system does not run throughout the entire width.

Type	Order no.	Designation	Width mm	Pitch mm	TI mm
RB 031	100000003100	Shelf	31.0	5.6	
RB 048	100000004800	Shelf	48.0	5.6	
RB 070	100000007000	Shelf	70.0	5.6	
RB 092	100000009200	Shelf	92.0	5.6	
RB 128	100000012800	Shelf	128.0	5.6	
RB 167	100000016700	Shelf	167.0	5.6	
RB 218	100000021800	Shelf	218.0	5.6	
RTA 41	1000810100	Shelf support, exterior, incl. pin		5.6	6.0
RTI 41	1000909100	Shelf support, interior, incl. pin		5.6	6.0

Separator

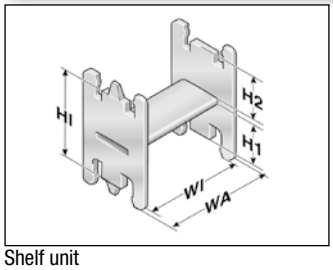


Separator

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	TI mm	H1 mm	H2 mm	H3 mm	HI mm
TR 41	041000009200	Separator	5.6	3.5	16.1	22.9	28.9	42.0

Shelf unit



Shelf unit

Insert to obtain additional levels in pre-defined window distances.

Type	Order no.	Designation	Pitch mm	WA mm	WI mm	H1 mm	H2 mm	HI mm
RE 36/11	100000361112	H-shaped shelf unit	5.6	42.5	36.5	26.2	11.5	42.0
RE 59/18	100000591812	H-shaped shelf unit	5.6	65.0	59.0	18.8	18.8	42.0
RE 81/11	100000811112	H-shaped shelf unit	5.6	87.5	81.5	26.2	11.5	42.0

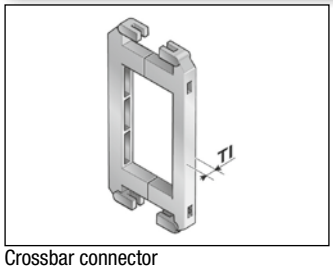
Bracket bar

Bracket bar

Large-diameter conduits are routed securely by using a bracket bar (BS). This bar is installed on the frame bridges or the covers of the cable drag chain.
The bracket bar can be installed on both the inside and outside bend.
The bracket bar support (BSH) is used to attach the bars to PowerLine series frame bridges. Two bracket bar supports are required for each bar.

Type	Order no.	Designation	Conduit diameter max. mm	Installation height (EH) mm	Inner chain width min. mm
BS 120-5	052412000000	Bracket bar	115.0	140.0	171.0
BS 153-5	052415300000	Bracket bar	148.0	170.0	220.0
BS 187-5	052418700000	Bracket bar	182.0	205.0	246.0
BSH-5	052400000000	Bracket bar support			

Crossbar connector

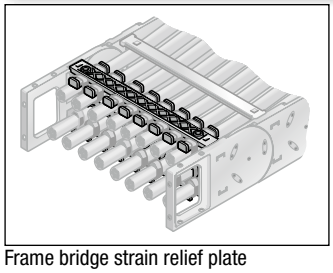


Crossbar connector

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 41	041000009600	Crossbar connector	7.5
RSV 41 Alu	041000009800	Crossbar connector for aluminium frame bridges	7.5

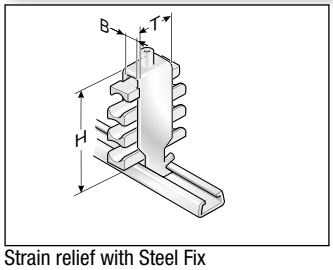
Frame bridge strain relief plate


Frame bridge strain relief plate

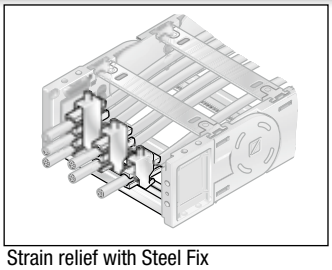
Fixed integrated frame bridge strain relief plates in the chain brackets. Tailored to all frame bridge widths up to 246 mm. May be assembled on the inside and outside bends at both chain endings.

Type	Order no.	Designation	Note	For internal width mm
RS-ZL 045-5	052004500010	Frame bridge strain relief plate		45.0
RS-ZL 062-5	052006200010	Frame bridge strain relief plate		62.0
RS-ZL 071-5	052007100010	Frame bridge strain relief plate		71.0
RS-ZL 084-5	052008400010	Frame bridge strain relief plate		84.0
RS-ZL 096-5	052009600010	Frame bridge strain relief plate		96.0
RS-ZL 107-5	052010700010	Frame bridge strain relief plate		107.0
RS-ZL 121-5	052012100010	Frame bridge strain relief plate		121.0
RS-ZL 133-5	052013300010	Frame bridge strain relief plate		133.0
RS-ZL 144/146-5	052014400010	Frame bridge strain relief plate	also for internal width 146 mm	144.0
RS-ZL 158-5	052015800010	Frame bridge strain relief plate		158.0
RS-ZL 171-5	052017100010	Frame bridge strain relief plate		171.0
RS-ZL 182-5	052018200010	Frame bridge strain relief plate		182.0
RS-ZL 196-5	052019600010	Frame bridge strain relief plate		196.0
RS-ZL 220-5	052022000010	Frame bridge strain relief plate		220.0
RS-ZL 246-5	052024600010	Frame bridge strain relief plate		246.0

Strain relief



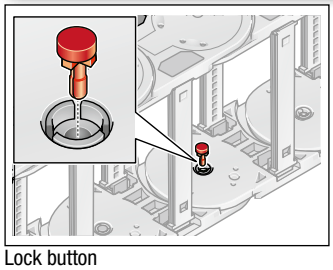
Strain relief with Steel Fix

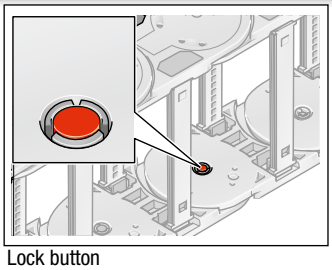

Strain relief with Steel Fix

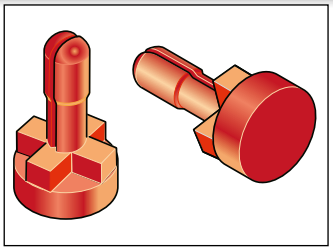
C-rails (cathodic dipped) for permanent integration, for accommodating the Steel Fix bow clamps in the chain brackets. The bow clamps can take up to 3 cables and are suitable for C-rails with a groove width of 11 mm. Due to the design of the trough elements a cable preserving cable guidance is ensured. 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
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

Lock button


Lock button

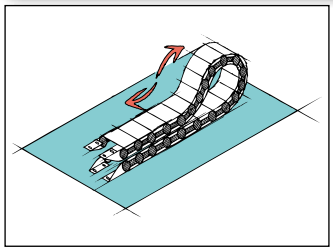

Lock button

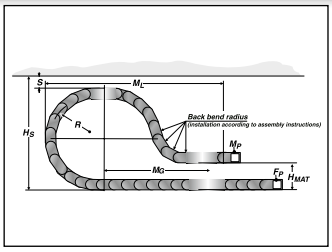


To increase the side stability, we recommend the use of lock buttons during strong lateral acceleration or when installed „laying on the side (turned 90°) without support“.

Type	Order no.
MP32/41 lock button	041000008000

Lowered fixing point





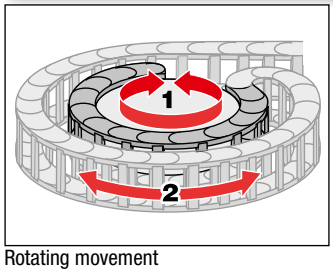
It is sometimes necessary to lower the height of the moving attachment point.

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

Please contact our application engineers.

Radius R mm	Height of moving end connection (H_{MAT}) mm	Safety margin (S) mm	Installation height incl. safety (H_S) mm	Projection (M_L) mm	Additional links qty.	of which additional back chain links qty.
200.0	190.0	50.0	522.0	770.0	13.0	2.0
250.0	220.0	50.0	622.0	910.0	15.0	2.0
300.0	280.0	50.0	722.0	1180.0	19.0	2.0
350.0	320.0	50.0	822.0	1140.0	19.0	3.0

Back radii

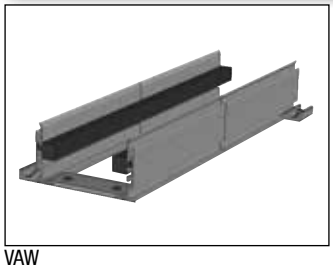


Rotating movement

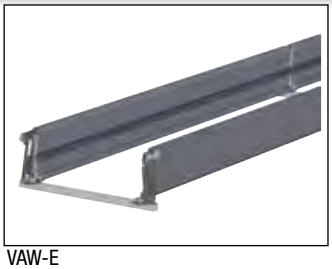
Side links with radius forward (R) and radius backward (Rü) allow for movement in two directions. This is intended for rotating movements and lowered chain brackets.

Type	Order no.	Radius mm	Back radius mm
SR 41 (RÜ200/R125)	041000009060	125.0	200.0
SR 41 (RÜ200/R160)	041000012060	160.0	200.0
SR 41 (RÜ200/R175)	041000015060	175.0	200.0
SR 41 (RÜ200/R200)	041000020060	200.0	200.0
SR 41 (RÜ200/R250)	041000025060	250.0	200.0
SR 41 (RÜ200/R300)	041000030060	300.0	200.0
SR 41 (RÜ200/R350)	041000035060	350.0	200.0

Guide channels (VAW)



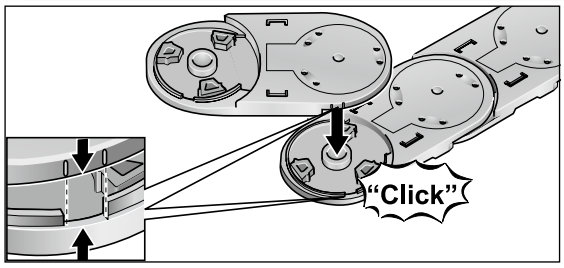
VAW



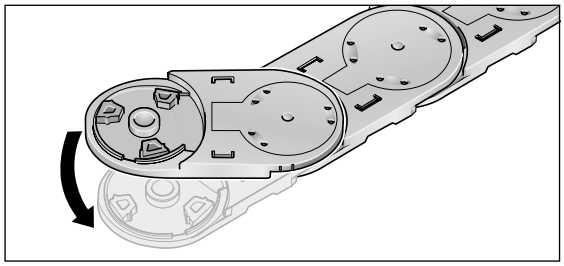
VAW-E

For this cable drag chain, a range of variable guide channel systems are available, constructed from aluminium or stainless steel 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“.

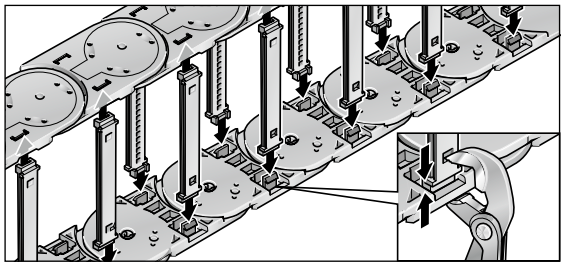
Assembly



Step 1

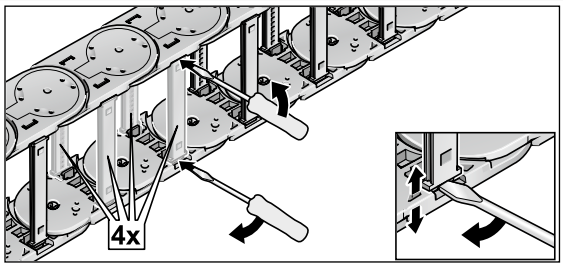


Step 2

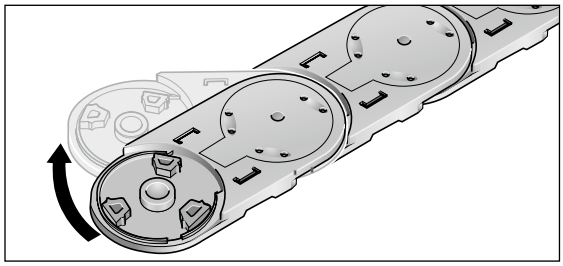


Step 3

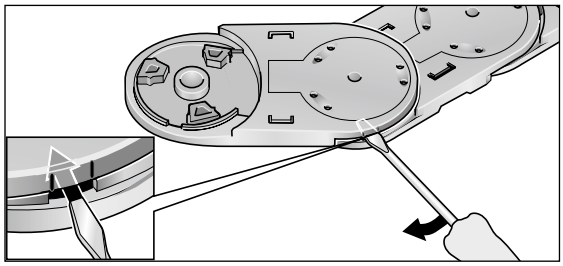
Disassembly



Step 1

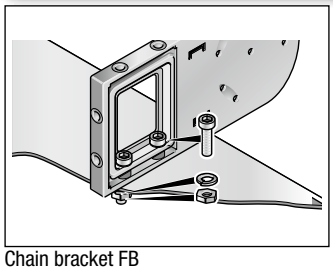


Step 2

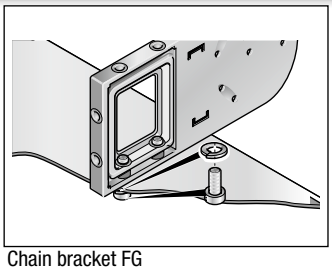


Step 3

Assembly instruction flexible chain bracket



Chain bracket FB



Chain bracket FG

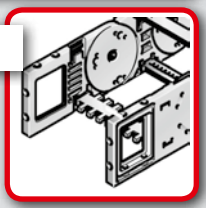
Brass bushes guarantee long-lasting fastening without cold flow in the plastic.

Version KA-FB:
Integrated through-hole fastened down using screw and nut.
Version KA-FG:
Built-in threads allow for quick and easy on-site mounting, since a screw, including a retaining washer where necessary, is sufficient.

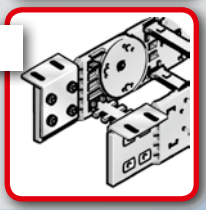
System overview

1 Chain bracket

Chain bracket flexible

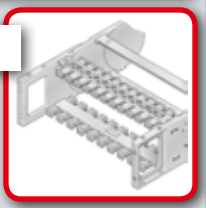


Chain bracket angle

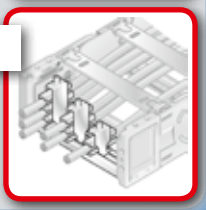


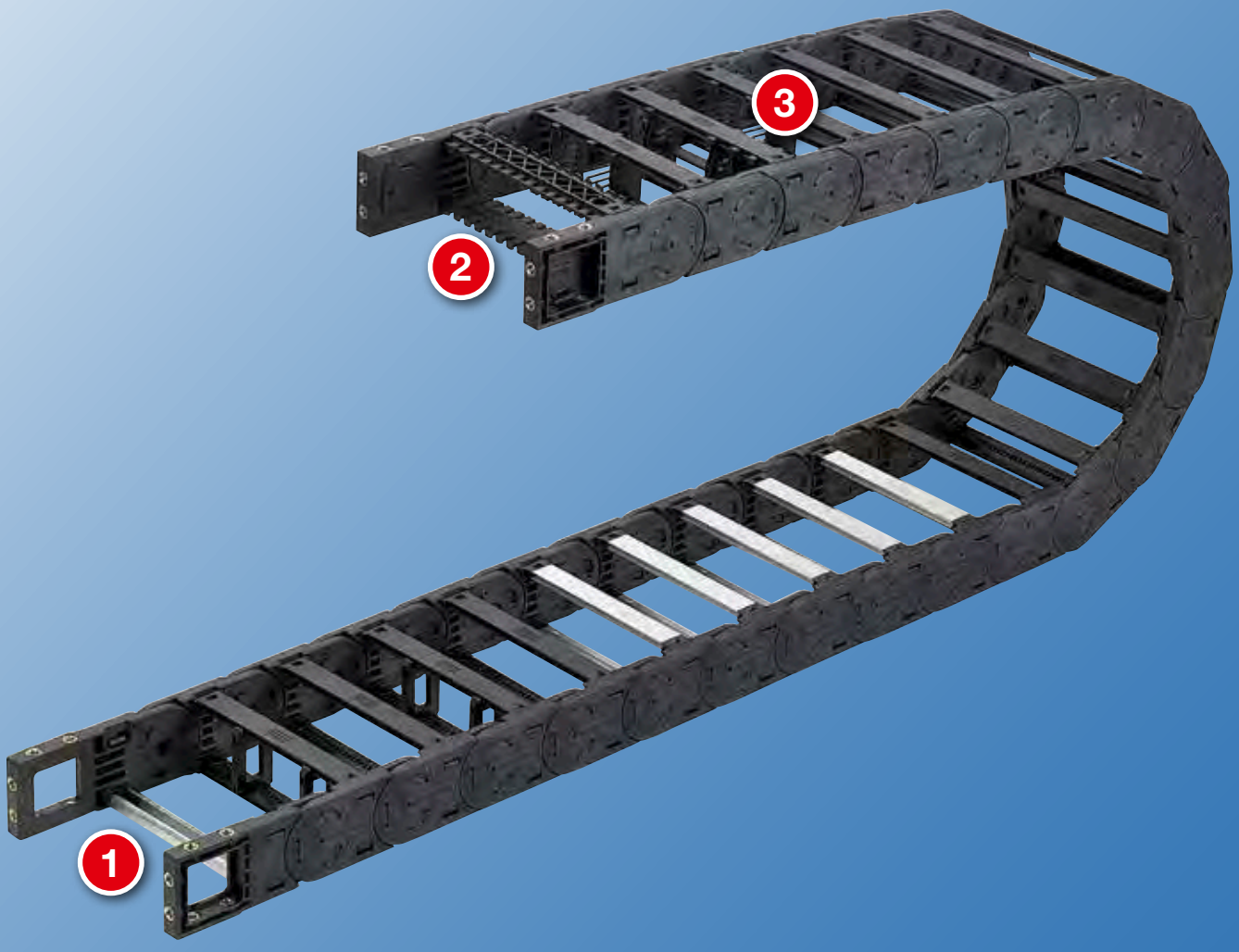
2 Strain relief

Frame bridge RS-ZL



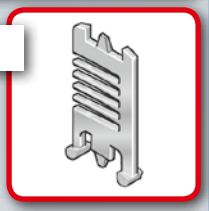
STF Steel Fix



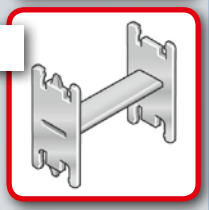


3 Shelving system

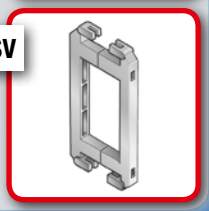
Separator TR



H-shaped shelf unit RE



Frame bridge connector RSV

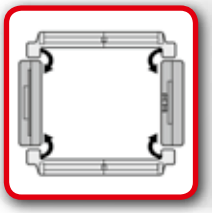


Guide channels

Aluminium VAW

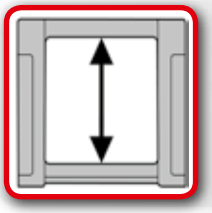
Stainless steel VAW-E

Technical data



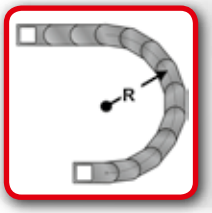
Loading side

inside and outside flexure curve



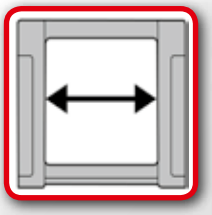
Available interior heights

52.0 mm



Available radii

100.0 – 350.0 mm



Available interior widths

45.0 – 546.0 mm

With aluminium frame bridge
80.0 – 600.0 mm

Ordering key

Type	Variation						
		Inside width mm	Outside width mm	Radius mm	Ridge version	Material	Chain length mm
0521	30	45 62 71 84 96 107 121 133 144 146 158 171 182 196 220 246 296 346 396 421 446 496 546	77 94 103 116 128 139 153 165 176 178 190 203 214 228 252 278 328 378 428 453 478 528 578	100 150 200 250 300 350	0 1 2 3 4 5 6 7 9	0 9	

Ordering key _

Note on configuration

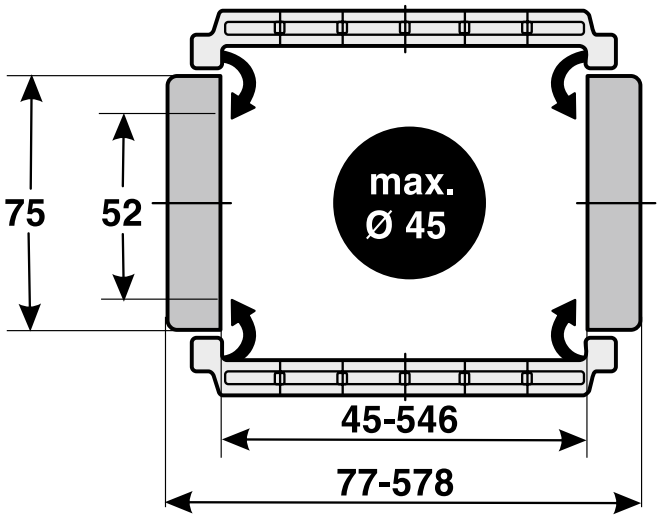
Frame bridges and cover from aluminium:
Aluminium frame bridges and covers can be supplied in 1 mm width sizes for inner widths from 80.0 mm – 600.0 mm.
If frame bridge strain relief plates (RS-ZL) are to be deployed, take standard widths into account.

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
1	PA full-ridged without bias
2	PA half-ridged with bias
3	PA half-ridged without bias
4	Aluminium full-ridged with bias
5	Aluminium full-ridged without bias
6	Aluminium half-ridged with bias
7	Aluminium half-ridged without 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: 0521 30 045 100 0 0 1365
Frame bridge in outside bend, frame bridge in inside bend, can be opened from inside and outside bend
Inside width 45 mm; radius 100 mm
Plastic bridge, full-ridged with bias, material black-coloured polyamide
Chain length 1365 mm (15 links)

Technical specifications

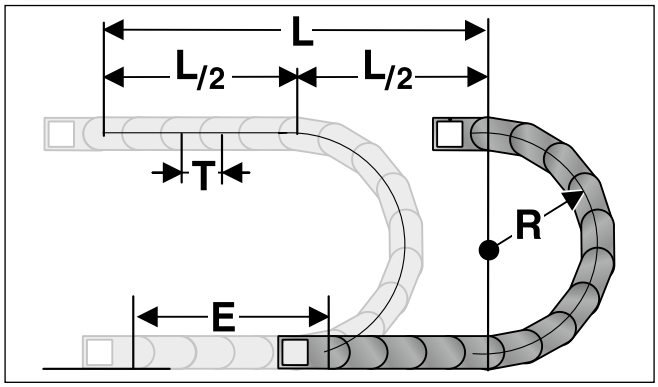
Travel distance gliding L_g max.:	150.0 m
Travel distance self-supporting L_f max.:	see diagram
Travel distance vertical, hanging L_{vh} max.:	60.0 m
Travel distance vertical, upright L_{vs} max.:	6.0 m
Rotated 90°, unsupported L_{90f} max.:	3.0 m
Speed, gliding V_g max.:	5.0 m/s
Speed, self-supporting V_f max.:	20.0 m/s
Acceleration, gliding a_g max.:	25.0 m/s²
Acceleration, self-supporting a_f max.:	30.0 m/s²

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:	UL 94 HB

Other material properties on request.

Determining the chain length

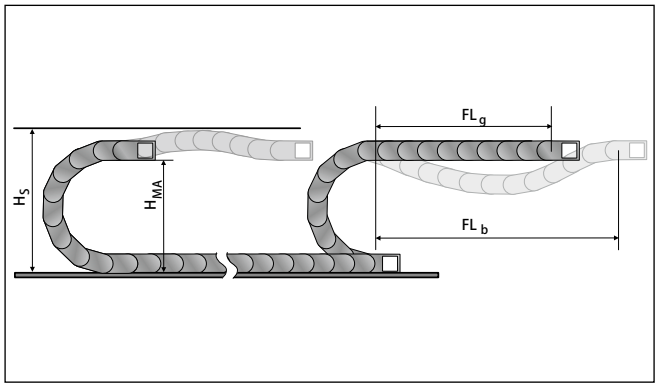


The fixed point of the cable drag chain should be connected in the middle of the travel distance.
This arrangement gives the shortest connection between the fixed point and the moving consumer and thus the most efficient chain length.

Chain length calculation = L/2 + π * R + E
≈ 1 m chain = 11 qty. x 91.0 mm links.

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

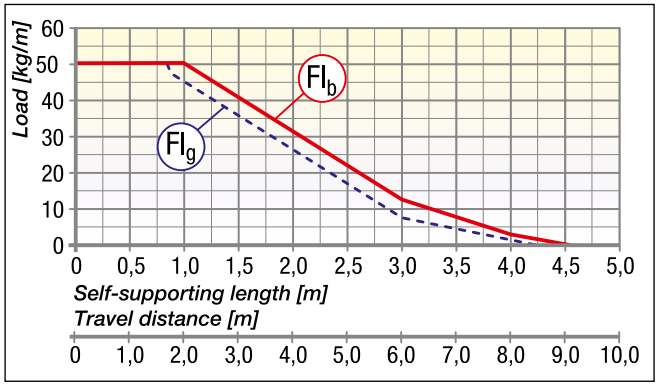
Self-supporting length



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

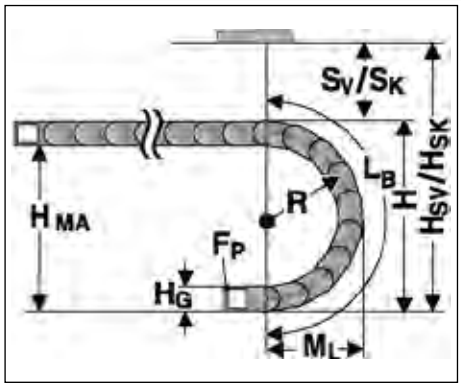
Load diagram for self-supporting applications



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

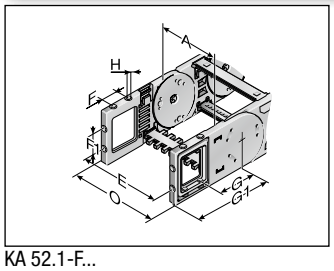
FL_b Self-supporting Length, upper run bent
In the FL_b range, the chain upper run has a sag of more than , but this is still less than the maximum sag.
Where the sag is greater than that permitted in the FL_b range, the application is critical and should be avoided. The self-supporting length can be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

Installation dimensions



Radius R	100	150	200	250	300	350
Outside height of chain link (H_G)	74	74	74	74	74	74
Height of bend (H)	304	404	504	604	704	804
Height of moving end connection (H_{MA})	230	330	430	530	630	730
Safety margin with bias (S_V)	46	46	46	46	46	46
Installation height with bias (H_{SV})	350	450	550	650	750	850
Safety margin without bias (S_K)	16	16	16	16	16	16
Installation height without bias (H_{SK})	320	420	520	620	720	820
Arc projection (M_L)	243	293	343	393	443	493
Bend length (L_B)	568	725	882	1039	1196	1353

Chain bracket flexible

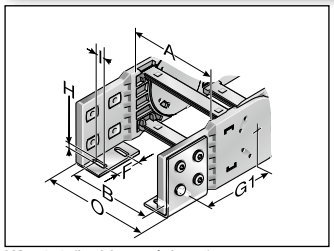


KA 52.1-F...

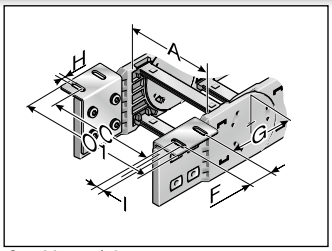
This chain bracket offers universal connection options (top, bottom and front) and is attached to the ends of the chain like a side link. This allows the chain to move right up to the bracket. Each chain requires one male and one female bracket. M8 screws are used to secure the brackets in place. Extrusion-coated metal bushes with either a through-hole (-FB) or a threaded hole (-FG) ensure the permanent, high-strength transmission of even extreme forces onto the cable drag chain.

Type	Order no.	Mate-rial	Version	Inside width A mm	E mm	F mm	F1 mm	G mm	G1 mm	H	HØ mm	Outside width KA O mm
KA 52.1-FB male	0521000056	Plastic	with bush	45.0 – 546.0	A+16.0	35.0	30.0	89.0	146.0		8.5	A+36.0
KA 52.1-FB female	0521000057	Plastic	with bush	45.0 – 546.0	A+16.0	35.0	30.0	89.0	146.0		8.5	A+36.0
KA 52.1-FG male	0521000058	Plastic	with thread	45.0 – 546.0	A+16.0	35.0	30.0	89.0	146.0	M8		A+36.0
KA 52.1-FG female	0521000059	Plastic	with thread	45.0 – 546.0	A+16.0	35.0	30.0	89.0	146.0	M8		A+36.0

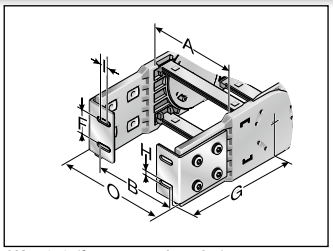
Chain bracket angle



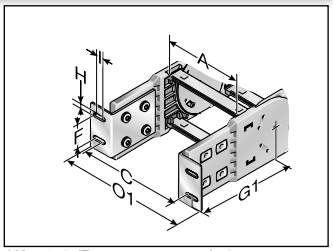
KA 52.1 (inside up / down)



Outside up / down



KA 52.1 (front page interior)

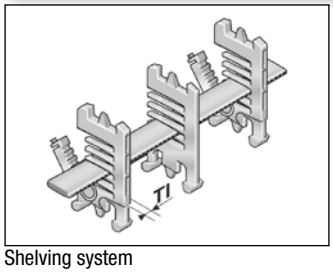


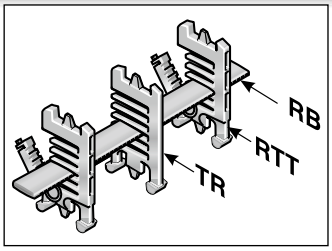
KA 52.1 (Front page exterior)

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 M6 screws.

Type	Order no.	Material	Inside width A mm	B mm	C mm	F mm	G mm	G1 mm	HØ mm	I mm	Outside width KA O mm	Outside width KA O1 mm
KA 52.1 male	0521000050	Sheet steel	45.0 – 546.0	A-2.5	A+34.5	32.0	95.5	149.0	6.5	14.0	A+32.0	A+71.0
KA 52.1 female	0521000051	Sheet steel	45.0 – 546.0	A-2.5	A+34.5	32.0	95.5	149.0	6.5	14.0	A+32.0	A+71.0

Shelving system



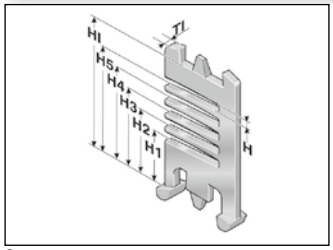


Shelving system

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. Pre-assembly is not necessary as the shelving system and cabling can be assembled quickly and easily on site.

Type	Order no.	Designation	Width mm	Pitch mm	Tl mm
RB 028-5	100000002800	Shelf	28.0	5.6	
RB 056-5	100000005601	Shelf	56.0	5.6	
RB 084-5	100000008400	Shelf	84.0	5.6	
RB 112-5	100000011200	Shelf	112.0	5.6	
RB 140-5	100000014000	Shelf	140.0	5.6	
RB 168-5	100000016800	Shelf	168.0	5.6	
RB 196-5	100000019600	Shelf	196.0	5.6	
RTT 52	100090522000	Shelf support, divisible		5.6	7.0

Separator

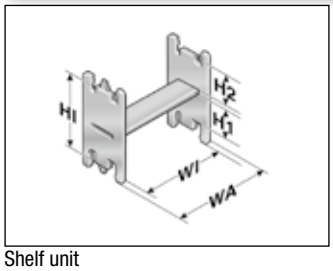


Separator

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	Hl mm
TR 52.1	052100009200	TR 52.1 Separator	5.6	3.5	4.0	15.6	22.0	28.2	34.6	41.0	52.0

Shelf unit



Shelf unit

Insert to obtain additional levels in pre-defined window distances.

Type	Order no.	Designation	Pitch mm	WA mm	Wl mm	H1 mm	H2 mm	Hl mm
RE 36/17	100000361714	H-shaped shelf unit	5.6	42.5	36.5	31.0	17.4	52.0
RE 59/24	100000592414	H-shaped shelf unit	5.6	65.0	59.0	24.2	24.2	52.0
RE 81/12	100000811214	H-shaped shelf unit	5.6	87.5	81.5	36.0	12.4	52.0

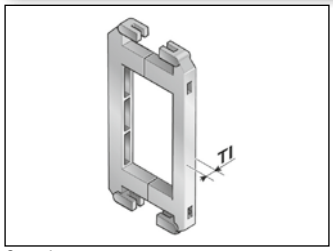
Bracket bar

Bracket bar

Large-diameter conduits are routed securely by using a bracket bar (BS). This bar is installed on the frame bridges or the covers of the cable drag chain.
The bracket bar can be installed on both the inside and outside bend.
The bracket bar support (BSH) is used to attach the bars to PowerLine series frame bridges. Two bracket bar supports are required for each bar.

Type	Order no.	Designation	Conduit diameter max. mm	Installation height (EH) mm	Inner chain width min. mm
BS 120-5	052412000000	Bracket bar	115.0	140.0	171.0
BS 153-5	052415300000	Bracket bar	148.0	170.0	220.0
BS 187-5	052418700000	Bracket bar	182.0	205.0	246.0
BSH-5	052400000000	Bracket bar support			

Crossbar connector

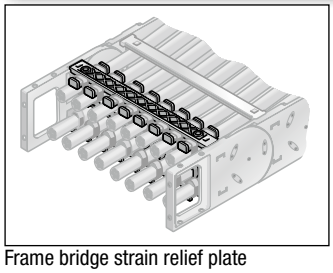


Crossbar connector

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	TI mm
RSV 52	052000009600	Crossbar connector	7.5
RSV 52 Alu	052000009800	Crossbar connector for aluminium frame bridges	7.5

Frame bridge strain relief plate

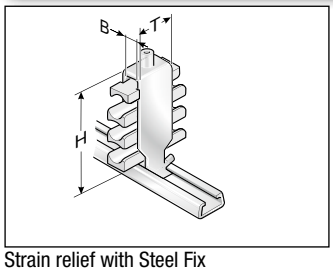


Frame bridge strain relief plate

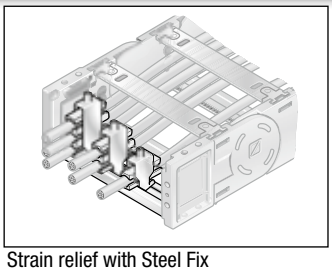
Fixed integrated frame bridge strain relief plates in the chain brackets. Tailored to all frame bridge widths up to 246 mm. May be assembled on the inside and outside bends at both chain endings.

Type	Order no.	Designation	Note	For internal width mm
RS-ZL 045-5	052004500010	Frame bridge strain relief plate		45.0
RS-ZL 062-5	052006200010	Frame bridge strain relief plate		62.0
RS-ZL 071-5	052007100010	Frame bridge strain relief plate		71.0
RS-ZL 084-5	052008400010	Frame bridge strain relief plate		84.0
RS-ZL 096-5	052009600010	Frame bridge strain relief plate		96.0
RS-ZL 107-5	052010700010	Frame bridge strain relief plate		107.0
RS-ZL 121-5	052012100010	Frame bridge strain relief plate		121.0
RS-ZL 133-5	052013300010	Frame bridge strain relief plate		133.0
RS-ZL 144/146-5	052014400010	Frame bridge strain relief plate	also for internal width 146 mm	144.0
RS-ZL 158-5	052015800010	Frame bridge strain relief plate		158.0
RS-ZL 171-5	052017100010	Frame bridge strain relief plate		171.0
RS-ZL 182-5	052018200010	Frame bridge strain relief plate		182.0
RS-ZL 196-5	052019600010	Frame bridge strain relief plate		196.0
RS-ZL 220-5	052022000010	Frame bridge strain relief plate		220.0
RS-ZL 246-5	052024600010	Frame bridge strain relief plate		246.0

Strain relief



Strain relief with Steel Fix



Strain relief with Steel Fix

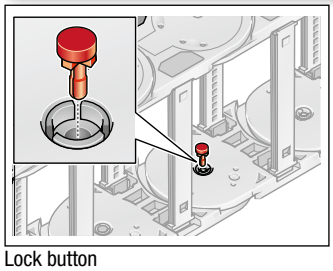
C-rails (cathodic dipped) for permanent integration, for accommodating the Steel Fix bow clamps in the chain brackets. The bow clamps can take up to 3 cables and are suitable for C-rails with a groove width of 11 mm. Due to the design of the trough elements a cable preserving cable guidance is ensured. 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.

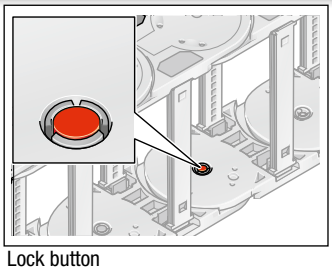
Type	Order no.	Designation	Ø mm	Seats qty.
Single clamp (for one cable)				
STF 12-1 Steel Fix	81661801	Hooped clamp	6.0 – 12.0	1
STF 14-1 Steel Fix	81661802	Hooped clamp	12.0 – 14.0	1
STF 16-1 Steel Fix	81661803	Hooped clamp	14.0 – 16.0	1
STF 18-1 Steel Fix	81661804	Hooped clamp	16.0 – 18.0	1
STF 20-1 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

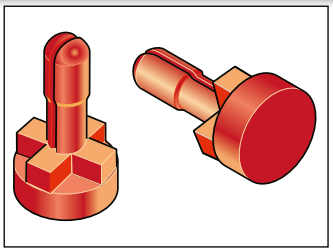
Strain relief (Continued...)

Type	Order no.	Designation	Ø mm	Seats qty.
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
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

Lock button


Lock button

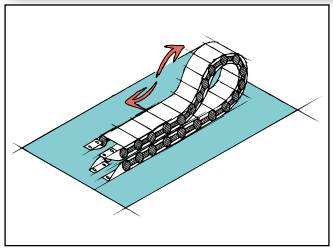

Lock button

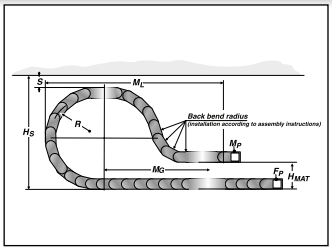


To increase the side stability, we recommend the use of lock buttons during strong lateral acceleration or when installed „laying on the side (turned 90°) without support“.

Type	Order no.
MP52/62/72 lock button	0520000080

Lowered fixing point





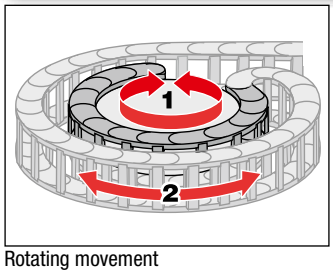
It is sometimes necessary to lower the height of the moving attachment point.

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

Please contact our application engineers.

Radius R mm	Height of moving end connection (H_{MAT}) mm	Safety margin (S) mm	Installation height incl. safety (H_S) mm	Projection (M_L) mm	Additional links qty.	of which additional back chain links qty.
200.0	210.0	50.0	565.0	830.0	10.0	3.0
250.0	250.0	50.0	665.0	990.0	13.0	3.0
300.0	300.0	50.0	765.0	900.0	14.0	3.0
350.0	330.0	50.0	865.0	1180.0	16.0	3.0

Back radii

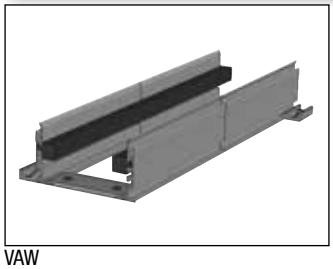


Rotating movement

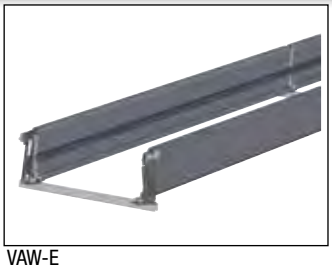
Side links with radius forward (R) and radius backward (Rü) allow for movement in two directions. This is intended for rotating movements and lowered chain brackets. Note: This type of chain has different chain links for the left or right side!

Type	Order no.	Radius mm	Back radius mm
SR 52.1 (RÜ200/R135) left	052100010060	135.0	200.0
SR 52.1 (RÜ200/R135) right	052100010062	135.0	200.0
SR 52.1 (RÜ200/R170) left	052100015060	170.0	200.0
SR 52.1 (RÜ200/R170) right	052100015062	170.0	200.0
SR 52.1 (RÜ200/R200) left	052100020060	200.0	200.0
SR 52.1 (RÜ200/R200) right	052100020062	200.0	200.0
SR 52.1 (RÜ200/R250) left	052100025060	250.0	200.0
SR 52.1 (RÜ200/R250) right	052100025062	250.0	200.0
SR 52.1 (RÜ200/R300) left	052100030060	300.0	200.0
SR 52.1 (RÜ200/R300) right	052100030062	300.0	200.0
SR 52.1 (RÜ200/R350) left	052100035060	350.0	200.0
SR 52.1 (RÜ200/R350) right	052100035062	350.0	200.0

Guide channels (VAW)



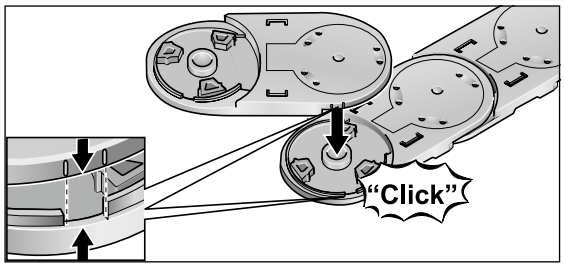
VAW



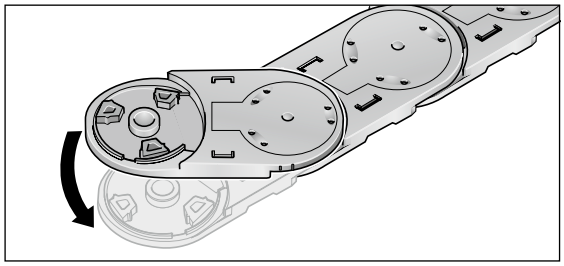
VAW-E

For this cable drag chain, a range of variable guide channel systems are available, constructed from aluminium or stainless steel 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“.

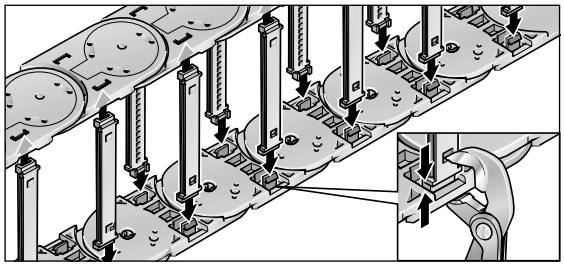
Assembly



Step 1

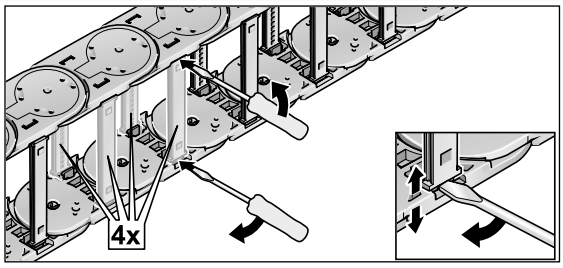


Step 2

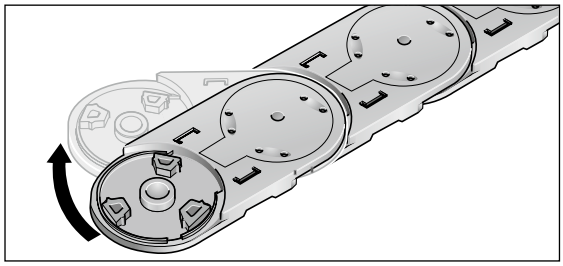


Step 3

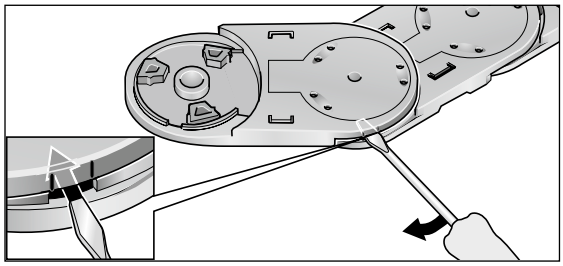
Disassembly



Step 1

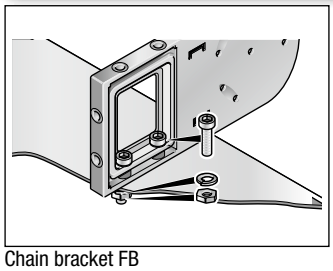


Step 2

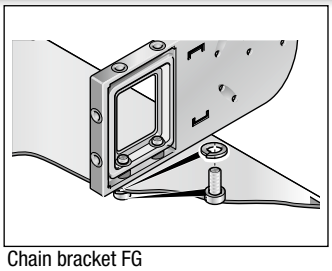


Step 3

Assembly instruction flexible chain bracket



Chain bracket FB



Chain bracket FG

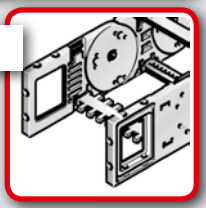
Brass bushes guarantee long-lasting fastening without cold flow in the plastic.

Version KA-FB:
Integrated through-hole fastened down using screw and nut.
Version KA-FG:
Built-in threads allow for quick and easy on-site mounting, since a screw, including a retaining washer where necessary, is sufficient.

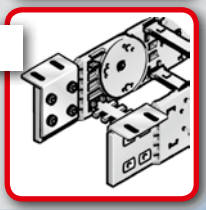
System overview

1 Chain bracket

Chain bracket flexible

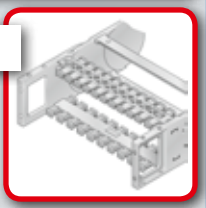


Chain bracket angle

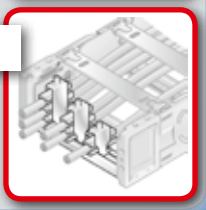


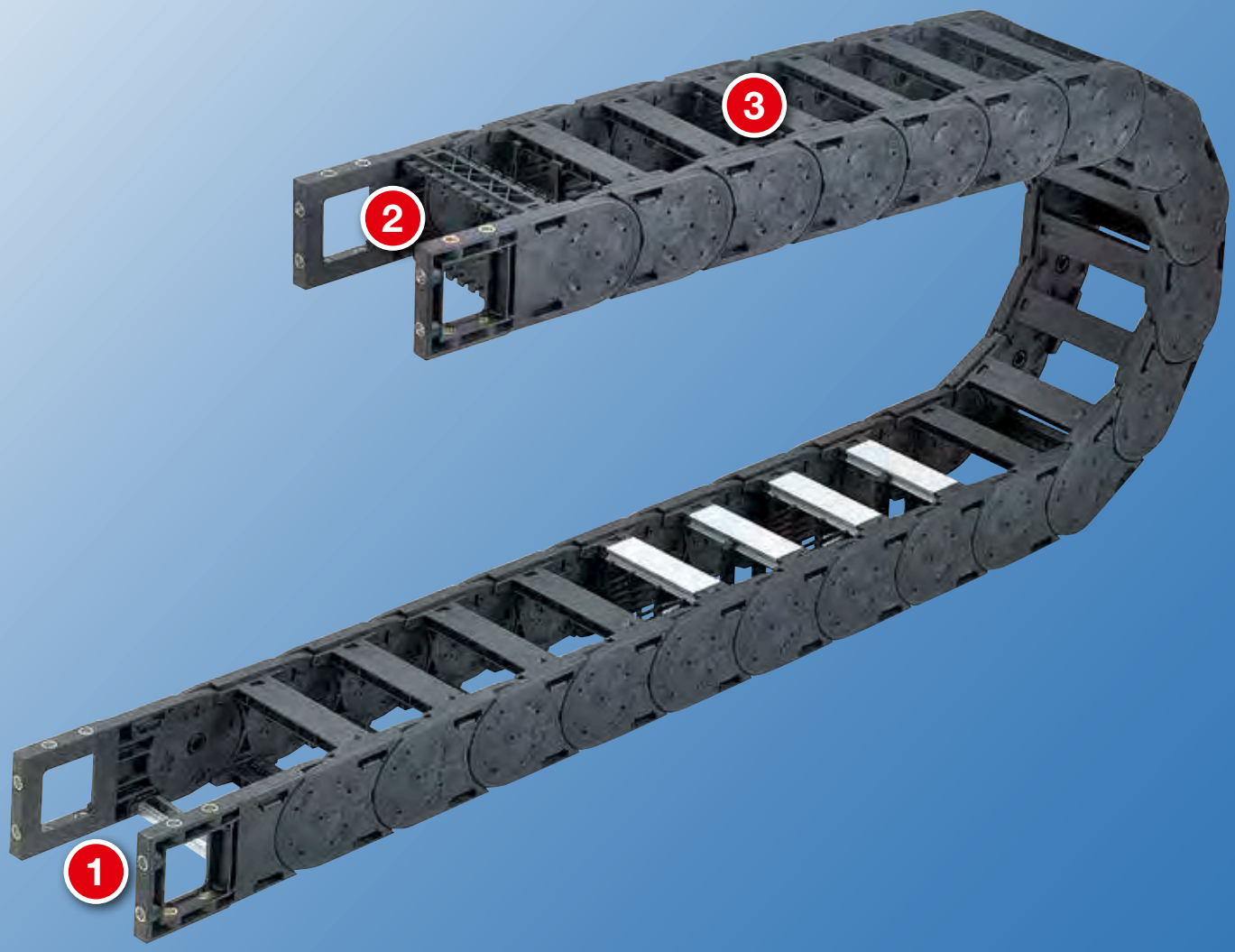
2 Strain relief

Frame bridge RS-ZL



STF Steel Fix

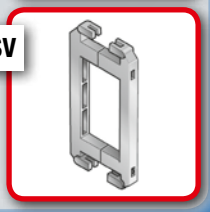




3 Shelving system

Separator TR

Frame bridge connector RSV

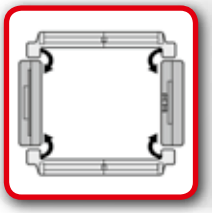


Guide channels

Aluminium VAW

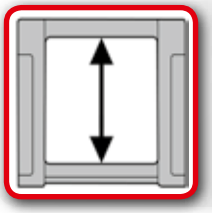
Stainless steel VAW-E

Technical data



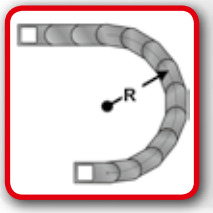
Loading side

inside and outside flexure curve



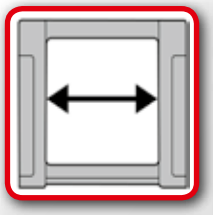
Available interior heights

62.0 mm



Available radii

150.0 – 500.0 mm



Available interior widths

118.0 – 518.0 mm

With aluminium frame bridge
118.0 – 600.0 mm

Ordering key

Type	Variation	Inside width mm	Outside width mm	Radius mm	Ridge version	Material	Chain length mm
		118	150				
		143	175				
		168	200				
		193	225				
		218	250				
		243	275		0		
		268	300		1		
		293	325		2		
		318	350	150	3		
		343	375	200	4		
		368	400	250	5		
		418	450	300	6		
		468	500	400	7	0	
0621	30	518	550	500	9	9	

Ordering key _ _ _ _   _ _   _ _ _   _ _ _   _   _   _ _ _ _ _ _

Note on configuration

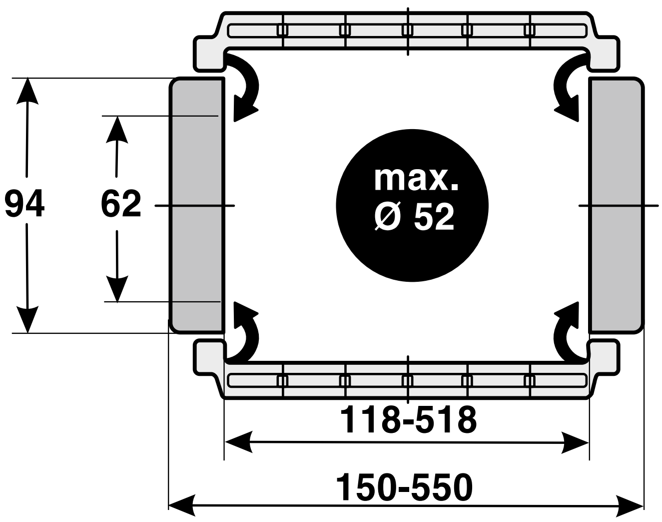
Frame bridges and cover from aluminium:
Aluminium frame bridges and covers can be supplied in 1 mm width sizes for inner widths from 118.0 mm – 600.0 mm.
If frame bridge strain relief plates (RS-ZL) are to be deployed, take standard widths into account.

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
1	PA full-ridged without bias
2	PA half-ridged with bias
3	PA half-ridged without bias
4	Aluminium full-ridged with bias
5	Aluminium full-ridged without bias
6	Aluminium half-ridged with bias
7	Aluminium half-ridged without 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: 0623 30 118 150 0 0 1600
Frame bridge in outside bend, frame bridge in inside bend, can be opened from inside and outside bend
Inside width 118 mm; radius 150 mm
Plastic bridge, full-ridged with bias, material black-coloured polyamide
Chain length 1600 mm (16 links)

Technical specifications

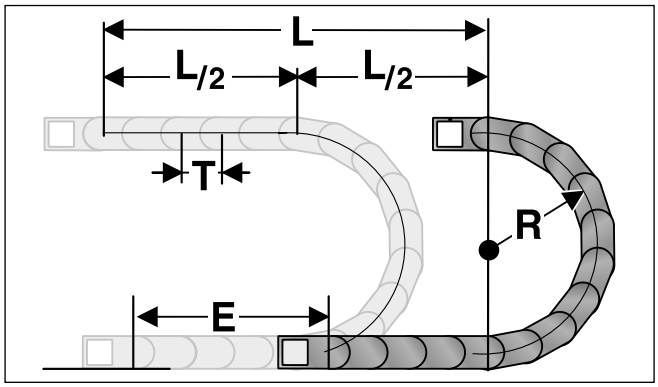
Travel distance gliding L_g max.:	150.0 m
Travel distance self-supporting L_f max.:	see diagram
Travel distance vertical, hanging L_{vh} max.:	65.0 m
Travel distance vertical, upright L_{vs} max.:	6.0 m
Rotated 90°, unsupported L_{90f} max.:	4.0 m
Speed, gliding V_g max.:	5.0 m/s
Speed, self-supporting V_f max.:	20.0 m/s
Acceleration, gliding a_g max.:	25.0 m/s²
Acceleration, self-supporting a_f max.:	40.0 m/s²

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:	UL 94 HB

Other material properties on request.

Determining the chain length

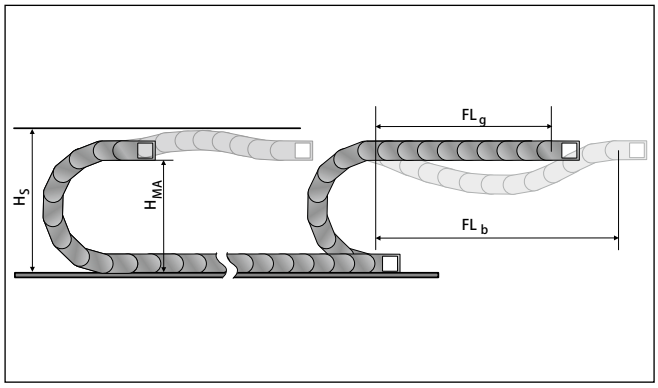


The fixed point of the cable drag chain should be connected in the middle of the travel distance.
This arrangement gives the shortest connection between the fixed point and the moving consumer and thus the most efficient chain length.

Chain length calculation = L/2 + π * R + E
≈ 1 m chain = 10 qty. x 100.0 mm links.

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

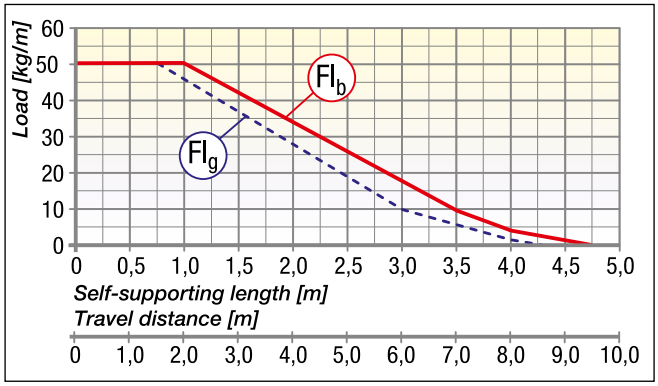
Self-supporting length



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

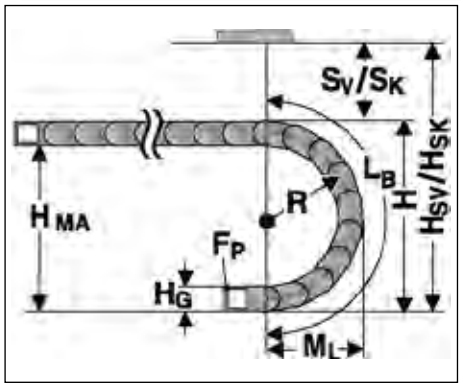
Load diagram for self-supporting applications



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

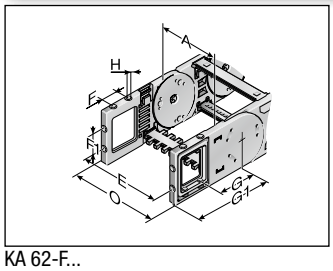
FL_b Self-supporting Length, upper run bent
In the FL_b range, the chain upper run has a sag of more than , but this is still less than the maximum sag.
Where the sag is greater than that permitted in the FL_b range, the application is critical and should be avoided. The self-supporting length can be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

Installation dimensions



Radius R	150	200	250	300	400	500
Outside height of chain link (H_G)	94	94	94	94	94	94
Height of bend (H)	424	524	624	724	924	1124
Height of moving end connection (H_{MA})	330	430	530	630	830	1030
Safety margin with bias (S_V)	50	50	50	50	50	50
Installation height with bias (H_{SV})	474	574	674	774	974	1174
Safety margin without bias (S_K)	20	20	20	20	20	20
Installation height without bias (H_{SK})	444	544	644	744	944	1144
Arc projection (M_L)	312	362	412	462	562	662
Bend length (L_B)	766	923	1080	1237	1551	1865

Chain bracket flexible

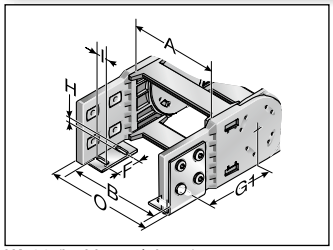


KA 62-F...

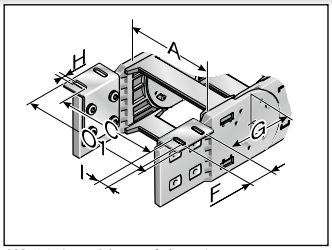
This chain bracket offers universal connection options (top, bottom and front) and is attached to the ends of the chain like a side link. This allows the chain to move right up to the bracket. Each chain requires one male and one female bracket. M8 screws are used to secure the brackets in place. Extrusion-coated metal bushes with either a through-hole (-FB) or a threaded hole (-FG) ensure the permanent, high-strength transmission of even extreme forces onto the cable drag chain.

Type	Order no.	Mate-rial	Version	Inside width A mm	E mm	F mm	F1 mm	G mm	G1 mm	H	HØ mm	Outside width KA O mm
KA 62-FB male	0620000056	Plastic	with bush	118.0 – 518.0	A+17.0	35.0	45.0	107.0	171.5		8.5	A+36.0
KA 62-FB female	0620000057	Plastic	with bush	118.0 – 518.0	A+17.0	35.0	45.0	107.0	171.5		8.5	A+36.0
KA 62-FG male	0620000058	Plastic	with thread	118.0 – 518.0	A+17.0	35.0	45.0	107.0	171.5	M8		A+36.0
KA 62-FG female	0620000059	Plastic	with thread	118.0 – 518.0	A+17.0	35.0	45.0	107.0	171.5	M8		A+36.0

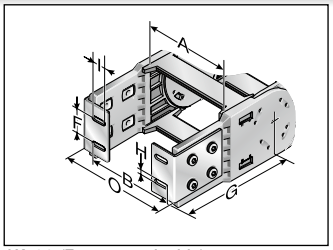
Chain bracket angle



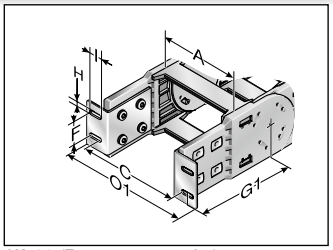
KA 62 (inside up / down)



KA 62 (outside up / down)



KA 62 (Front page inside)

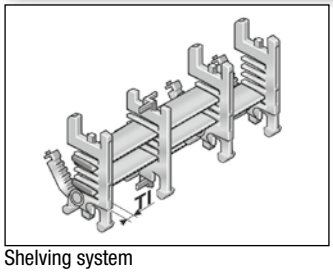


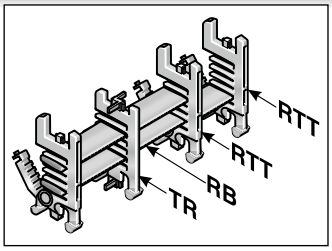
KA 62 (Front page exterior)

This chain bracket offers universal connection options (top, bottom and front) and is attached to the ends of the chain like a side link. This allows the chain to move right up to the bracket. Each chain requires one male and one female bracket. M8 screws are used to secure the brackets in place. Metal inserts (supplied) help to minimise the cold flow properties. This is an enormous advantage, guaranteeing the smooth transfer of high loads to the chain.

Type	Order no.	Material	Inside width A mm	B mm	C mm	F mm	G mm	G1 mm	HØ mm	I mm	Outside width KA O mm	Outside width KA O1 mm
KA 62 male	0620000050	Sheet steel	118.0 – 518.0	A-12.0	A+44.0	45.0	102.0	171.5	9.0	15.0	A+32.0	A+90.0
KA 62 female	0620000051	Sheet steel	118.0 – 518.0	A-12.0	A+44.0	45.0	102.0	171.5	9.0	15.0	A+32.0	A+90.0

Shelving system



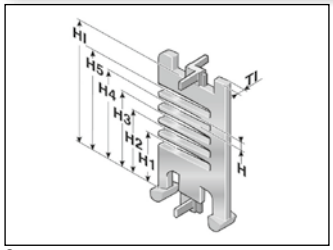


Shelving system

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	TI 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 62	100090622000	Shelf support, divisible		5.0	7.0

Separator

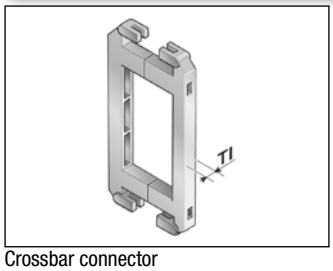


Separator

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	TI mm	H mm	H1 mm	H2 mm	H3 mm	H4 mm	H5 mm	HI mm
TR 62	062000009200	Separator	5.0	3.5	5.5	14.8	23.1	31.4	39.7	48.0	62.0

Crossbar connector

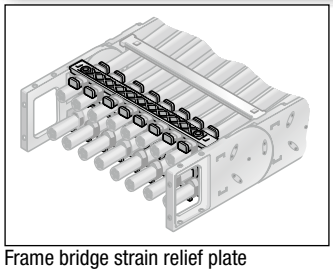


Crossbar connector

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	TI mm
RSV 62	062000009600	Crossbar connector	8.0
RSV 62 Alu	062000009800	Crossbar connector for aluminium frame bridges	8.0

Frame bridge strain relief plate

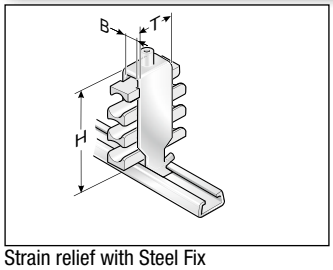


Frame bridge strain relief plate

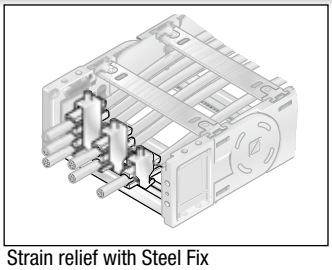
Fixed integrated frame bridge strain relief plates in the chain brackets. Accommodated to all widths of the frame bridges, up to 243 mm in size. May be assembled on the inside and outside flexure curves at both chain endings.

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
RS-ZL 243-7	072024300010	Frame bridge strain relief plate	243.0

Strain relief



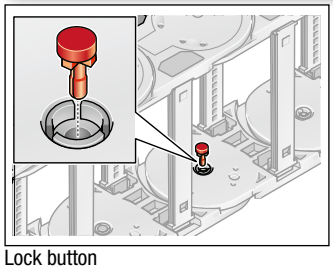
Strain relief with Steel Fix

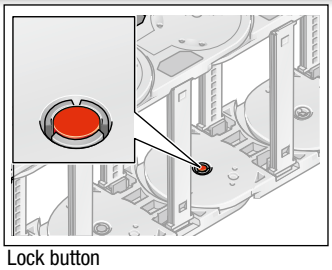

Strain relief with Steel Fix

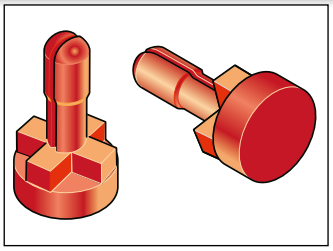
C-rails (cathodic dipped) for permanent integration, for accommodating the Steel Fix bow clamps in the chain brackets. The bow clamps can take up to 3 cables and are suitable for C-rails with a groove width of 11 mm. Due to the design of the trough elements a cable preserving cable guidance is ensured. 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
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

Lock button


Lock button

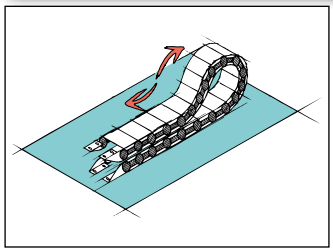

Lock button

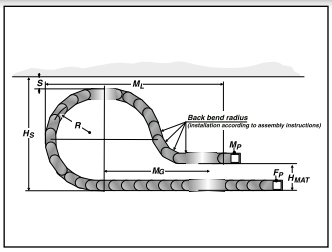


To increase the side stability, we recommend the use of lock buttons during strong lateral acceleration or when installed „laying on the side (turned 90°) without support“.

Type	Order no.
MP52/62/72 lock button	0520000080

Lowered fixing point





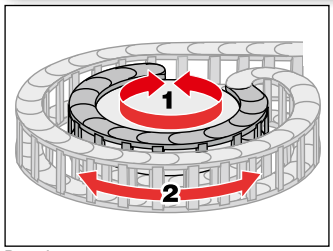
It is sometimes necessary to lower the height of the moving attachment point.

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

Please contact our application engineers.

Radius R mm	Height of moving end connection (H_{MAT}) mm	Safety margin (S) mm	Installation height incl. safety (H_S) mm	Projection (M_L) mm	Additional links qty.	of which additional back chain links qty.
200.0	230.0	60.0	564.0	850.0	11.0	2.0
250.0	270.0	60.0	664.0	990.0	12.0	2.0
300.0	320.0	60.0	764.0	1060.0	12.0	3.0
400.0	380.0	90.0	694.0	1060.0	14.0	3.0
500.0	440.0	60.0	1164.0	1520.0	17.0	3.0

Back radii

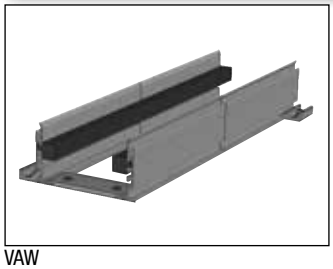


Rotating movement

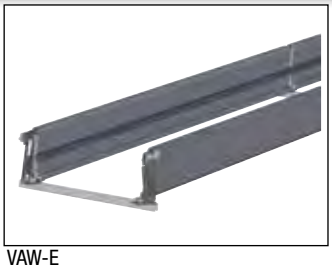
Side links with radius forward (R) and radius backward (Rü) allow for movement in two directions. This is intended for rotating movements and lowered chain brackets. Note: This type of chain has different chain links for the left or right side!

Type	Order no.	Radius mm	Back radius mm
SR 62.1 (RÜ300/R300) left	062100030060	300.0	300.0
SR 62.1 (RÜ300/R300) right	062100030062	300.0	300.0

Guide channels (VAW)



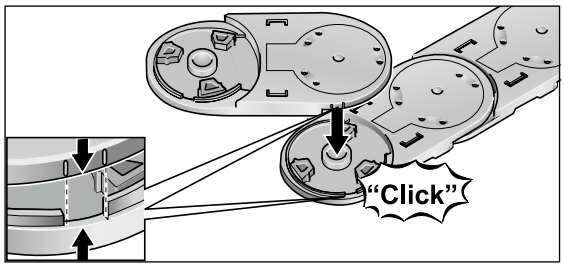
VAW



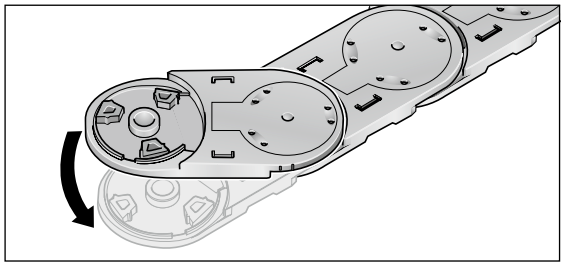
VAW-E

For this cable drag chain, a range of variable guide channel systems are available, constructed from aluminium or stainless steel 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“.

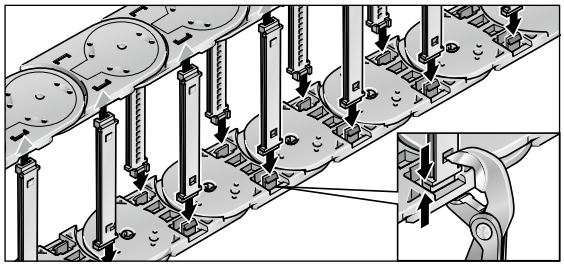
Assembly



Step 1

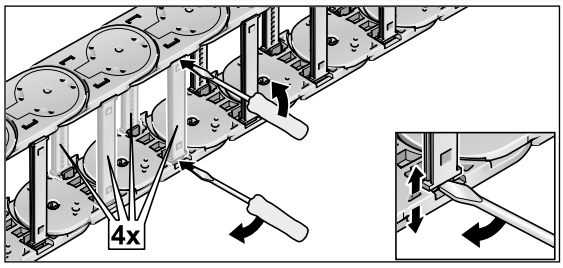


Step 2

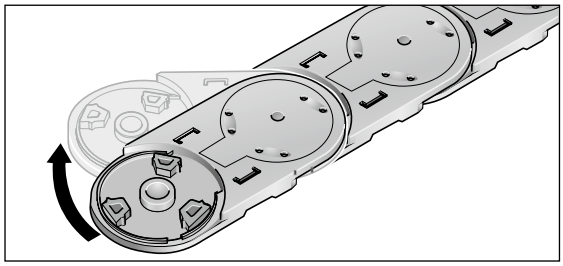


Step 3

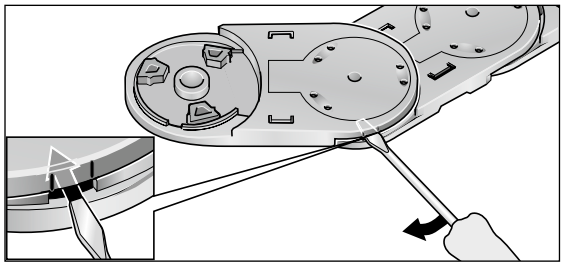
Disassembly



Step 1

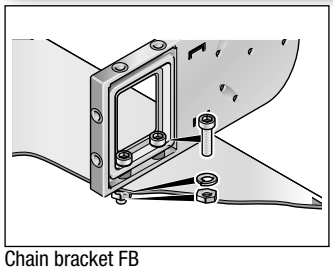


Step 2

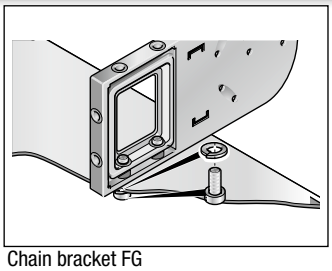


Step 3

Assembly instruction flexible chain bracket



Chain bracket FB



Chain bracket FG

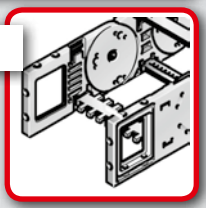
Brass bushes guarantee long-lasting fastening without cold flow in the plastic.

Version KA-FB:
Integrated through-hole fastened down using screw and nut.
Version KA-FG:
Built-in threads allow for quick and easy on-site mounting, since a screw, including a retaining washer where necessary, is sufficient.

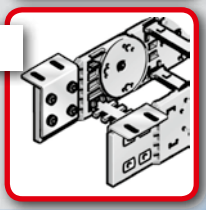
System overview

1 Chain bracket

Chain bracket flexible

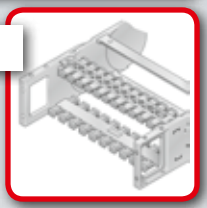


Chain bracket angle

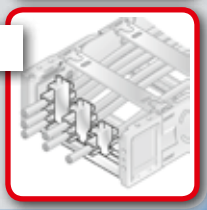


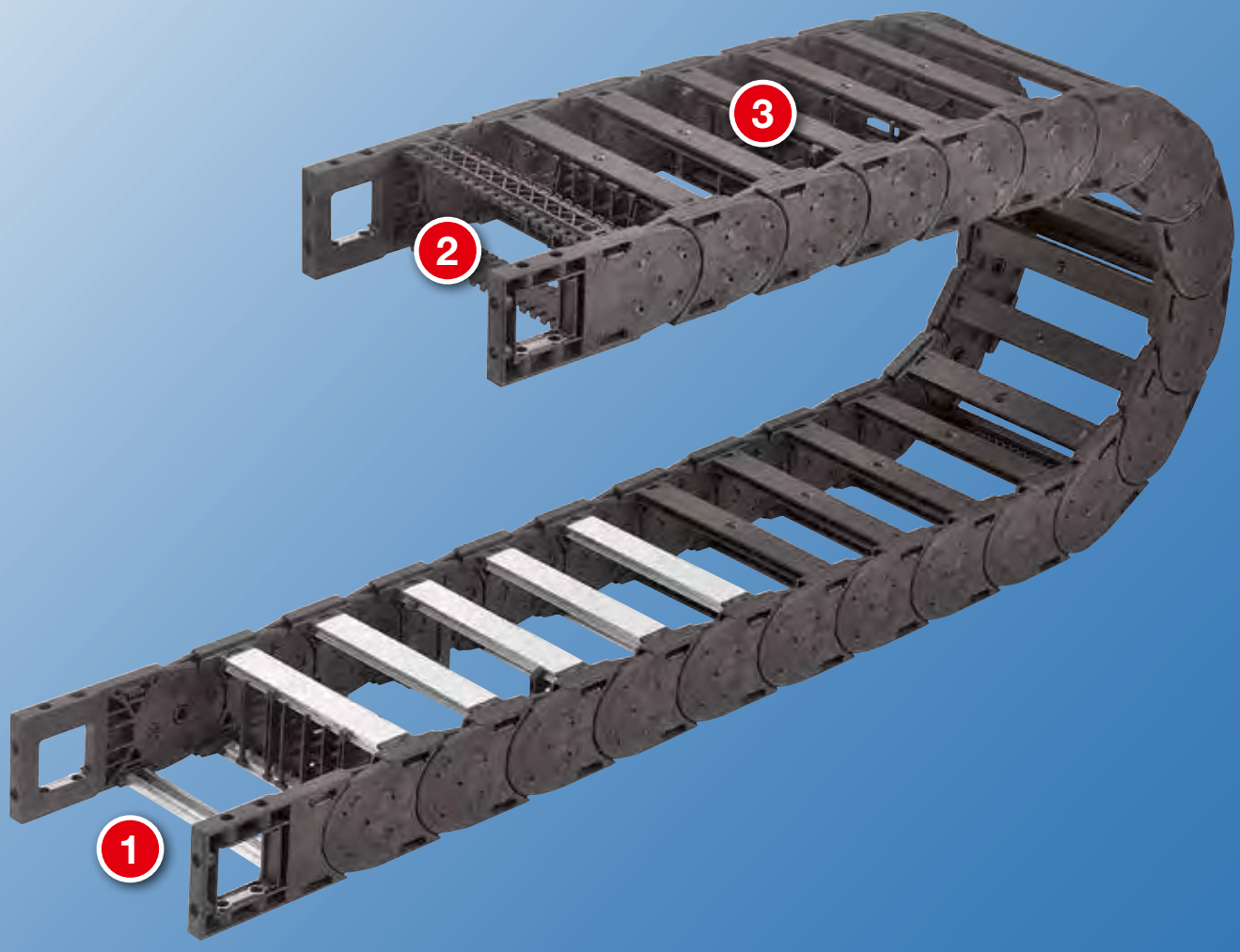
2 Strain relief

Frame bridge RS-ZL



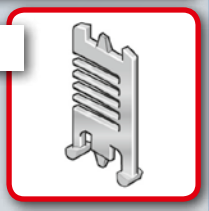
STF Steel Fix



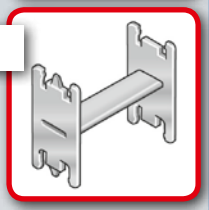


3 Shelving system

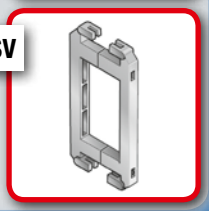
Separator TR



H-shaped shelf unit RE



Frame bridge connector RSV

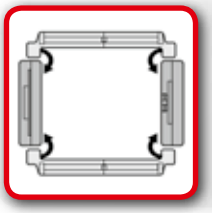


Guide channels

Aluminium VAW

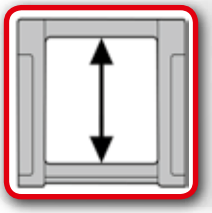
Stainless steel VAW-E

Technical data



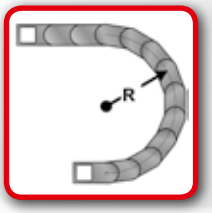
Loading side

inside and outside flexure curve



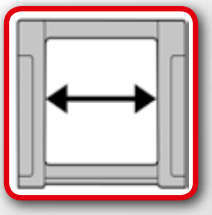
Available interior heights

72.0 mm



Available radii

150.0 – 500.0 mm



Available interior widths

118.0 – 518.0 mm

With aluminium frame bridge
118.0 – 600.0 mm

Ordering key

Type	Variation	Inside width mm	Outside width mm	Radius mm	Ridge version	Material	Chain length mm
		118	150				
		143	175				
		168	200				
		193	225				
		218	250				
		243	275				
		268	300				
		293	325				
		318	350	150			
		343	375	200	0		
		368	400	250	2		
		418	450	300	4		
		468	500	400	6	0	
0720	30	518	550	500	9	9	

Ordering key

Note on configuration

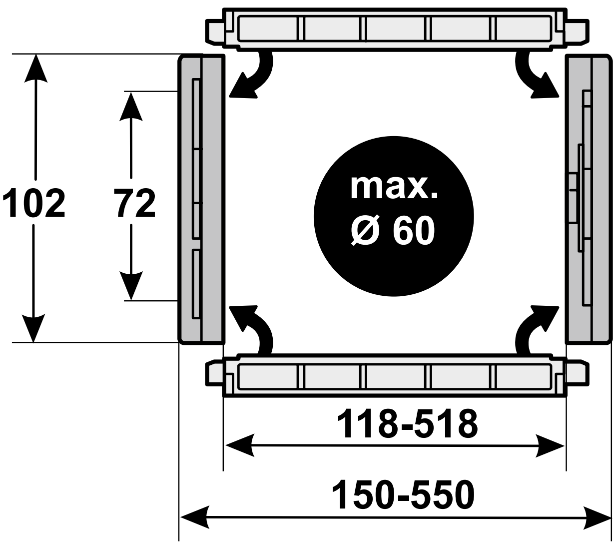
Frame bridges and cover from aluminium:
Aluminium frame bridges and covers can be supplied in 1 mm width sizes for inner widths from 118.0 mm – 600.0 mm.
If frame bridge strain relief plates (RS-ZL) are to be deployed, take standard widths into account.

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: 0720 30 118 150 0 0 1600
Frame bridge in outside bend, frame bridge in inside bend, can be opened from inside and outside bend
Inside width 118 mm; radius 150 mm
Plastic bridge, full-ridged with bias, material black-coloured polyamide
Chain length 1600 mm (16 links)

Technical specifications

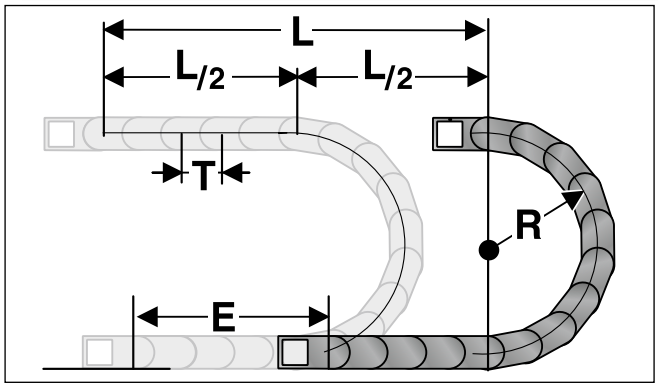
Travel distance gliding L_g max.:	150.0 m
Travel distance self-supporting L_f max.:	see diagram
Travel distance vertical, hanging L_{vh} max.:	80.0 m
Travel distance vertical, upright L_{vs} max.:	6.0 m
Rotated 90°, unsupported L_{90f} max.:	6.0 m
Speed, gliding V_g max.:	5.0 m/s
Speed, self-supporting V_f max.:	20.0 m/s
Acceleration, gliding a_g max.:	25.0 m/s²
Acceleration, self-supporting a_f max.:	40.0 m/s²

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:	UL 94 HB

Other material properties on request.

Determining the chain length

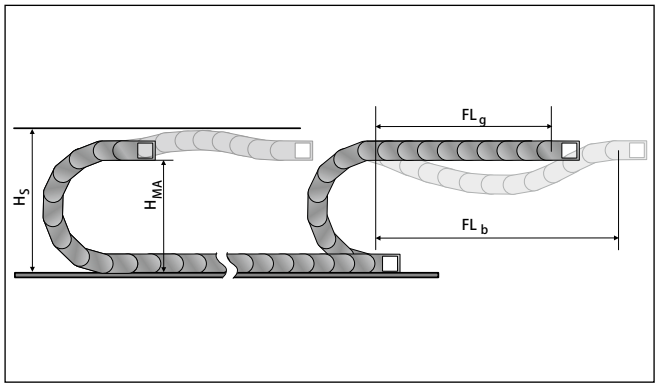


The fixed point of the cable drag chain should be connected in the middle of the travel distance.
This arrangement gives the shortest connection between the fixed point and the moving consumer and thus the most efficient chain length.

Chain length calculation = L/2 + π * R + E
≈ 1 m chain = 10 qty. x 100.0 mm links.

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

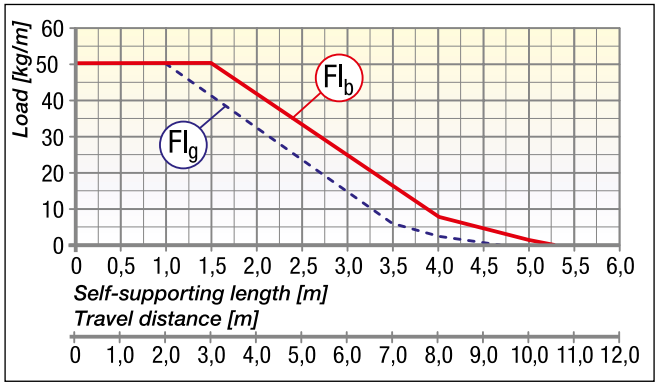
Self-supporting length



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

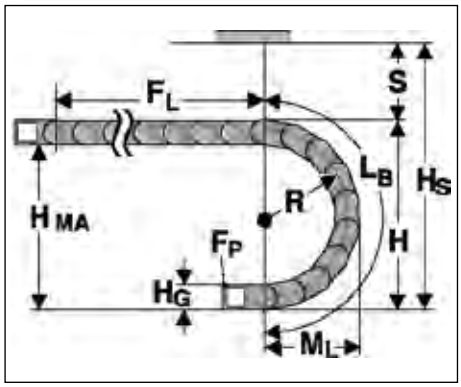
Load diagram for self-supporting applications



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

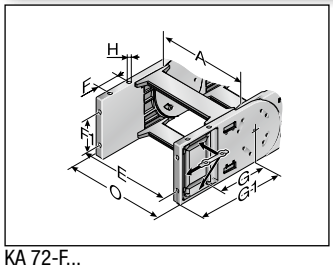
FL_b Self-supporting Length, upper run bent
In the FL_b range, the chain upper run has a sag of more than , but this is still less than the maximum sag.
Where the sag is greater than that permitted in the FL_b range, the application is critical and should be avoided. The self-supporting length can be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

Installation dimensions



Radius R	150	200	250	300	400	500
Outside height of chain link (H_G)	102	102	102	102	102	102
Height of bend (H)	422	522	622	722	922	1122
Height of moving end connection (H_{MA})	320	420	520	620	820	1020
Safety margin (S)	20	20	20	20	20	20
Installation height (H_S)	442	542	642	742	942	1142
Arc projection (M_L)	311	361	411	461	561	661
Bend length (L_B)	763	920	1077	1234	1548	1862

Chain bracket flexible

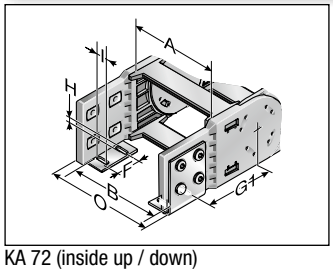


KA 72-F...

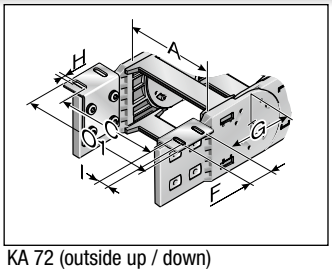
This chain bracket offers universal connection options (top, bottom and front) and is attached to the ends of the chain like a side link. This allows the chain to move right up to the bracket. Each chain requires one male and one female bracket. M10 screws are used to secure the brackets in place. Metal inserts (supplied) help to minimise the cold flow properties. This is an enormous advantage, guaranteeing the smooth transfer of high loads to the chain.

Type	Order no.	Material	Version	Inside width A mm	E mm	F mm	F1 mm	G mm	G1 mm	HØ mm	Outside width KA O mm
KA 72-F male	0720000054	Plastic	with bush	118.0 – 518.0	A+11.0	35.0	45.0	107.0	171.5	11.0	A+32.0
KA 72-F female	0720000055	Plastic	with bush	118.0 – 518.0	A+11.0	35.0	45.0	107.0	171.5	11.0	A+32.0

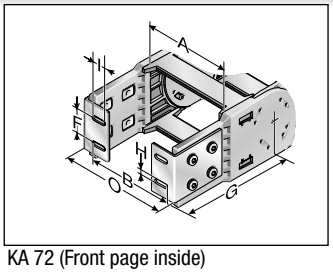
Chain bracket angle



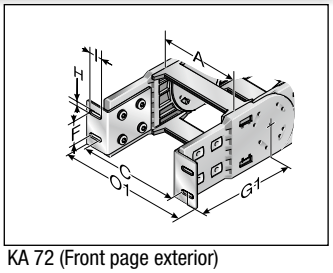
KA 72 (inside up / down)



KA 72 (outside up / down)



KA 72 (Front page inside)

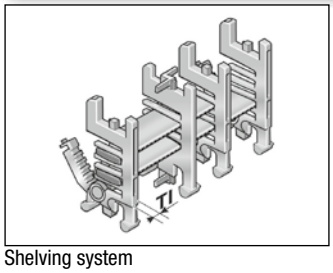


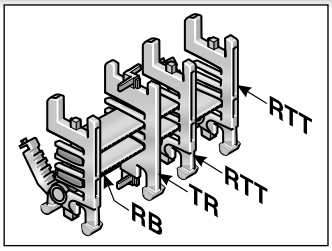
KA 72 (Front page exterior)

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 M8 screws.

Type	Order no.	Material	Inside width A mm	B mm	C mm	F mm	G mm	G1 mm	HØ mm	I mm	Outside width KA O mm	Outside width KA O1 mm
KA 72 male	0720000050	Sheet steel	118.0 – 518.0	A-16.0	A+48.0	45.0	106.0	179.5	9.0	32.0	A+32.0	A+126.0
KA 72 female	0720000051	Sheet steel	118.0 – 518.0	A-16.0	A+48.0	45.0	106.0	179.5	9.0	32.0	A+32.0	A+126.0

Shelving system



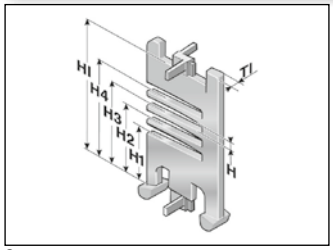


Shelving system

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	TI 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 72	100090722000	Shelf support, divisible		5.0	8.0

Separator

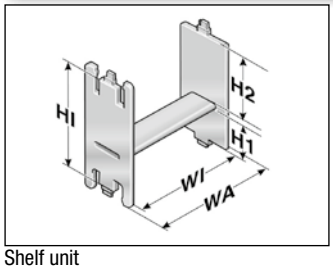


Separator

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	TI mm	H mm	H1 mm	H2 mm	H3 mm	H4 mm	HI mm
TR 72	072000009200	Separator	5.0	3.5	5.5	25.5	36.0	46.5	57.0	72.0

Shelf unit

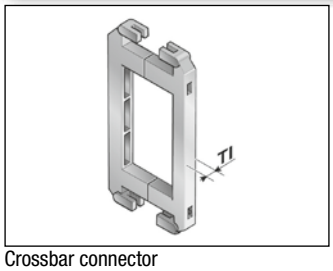


Shelf unit

Insert to obtain additional levels in pre-defined window distances.

Type	Order no.	Designation	Pitch mm	WA mm	WI mm	H1 mm	H2 mm	HI mm
RE 75/24	100000752418	H-shaped shelf unit	5.0	75.0	67.5	43.0	24.0	72.0
RE 75/36	100000753618	H-shaped shelf unit	5.0	75.0	67.5	33.5	33.5	72.0

Crossbar connector

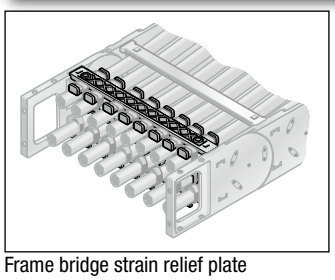


Crossbar connector

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	TI mm
RSV 72	072000009600	Crossbar connector	8.0
RSV 72 Alu	072000009800	Crossbar connector for aluminium frame bridges	8.0

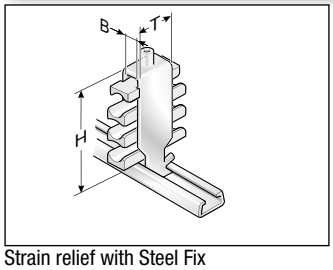
Frame bridge strain relief plate


Frame bridge strain relief plate

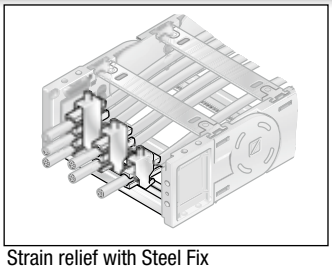
Fixed integrated frame bridge strain relief plates in the chain brackets. Accommodated to all widths of the frame bridges, up to 243 mm in size. May be assembled on the inside and outside flexure curves at both chain endings.

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
RS-ZL 243-7	072024300010	Frame bridge strain relief plate	243.0

Strain relief



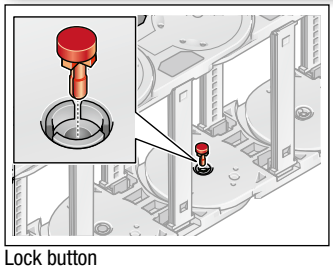
Strain relief with Steel Fix


Strain relief with Steel Fix

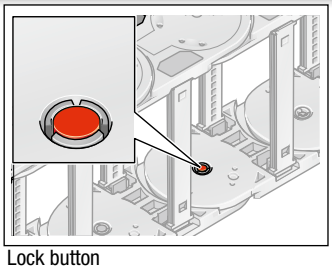
C-rails (cathodic dipped) for permanent integration, for accommodating the Steel Fix bow clamps in the chain brackets. The bow clamps can take up to 3 cables and are suitable for C-rails with a groove width of 11 mm. Due to the design of the trough elements a cable preserving cable guidance is ensured. 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
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

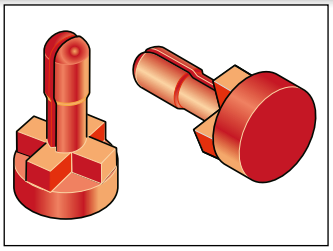
Lock button



Lock button



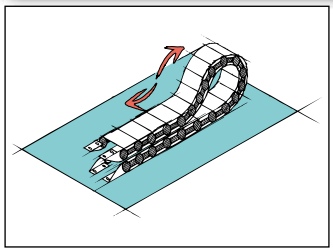
Lock button

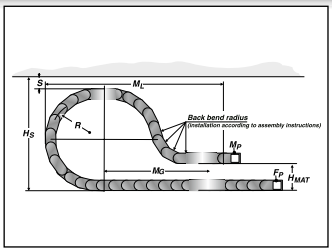


To increase the side stability, we recommend the use of lock buttons during strong lateral acceleration or when installed „laying on the side (turned 90°) without support“.

Type	Order no.
MP52/62/72 lock button	0520000080

Lowered fixing point





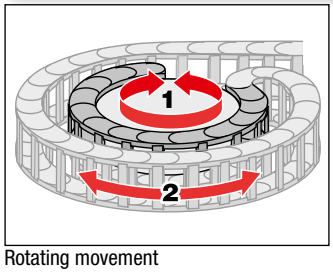
It is sometimes necessary to lower the height of the moving attachment point.

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

Please contact our application engineers.

Radius R mm	Height of moving end connection (H_{MAT}) mm	Safety margin (S) mm	Installation height incl. safety (H_S) mm	Projection (M_L) mm	Additional links qty.	of which additional back chain links qty.
200.0	240.0	60.0	580.0	850.0	9.0	2.0
250.0	260.0	60.0	680.0	1010.0	12.0	3.0
300.0	290.0	60.0	780.0	1150.0	13.0	3.0
400.0	350.0	60.0	980.0	1360.0	16.0	3.0
500.0	400.0	60.0	1180.0	1620.0	20.0	3.0

Back radii

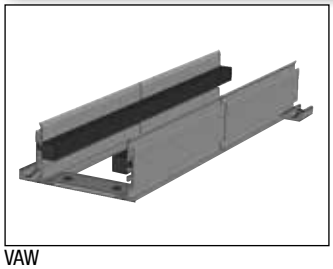


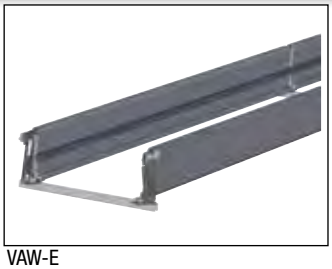
Rotating movement

Side links with radius forward (R) and radius backward (Rü) 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 72 (RÜ300/R300) left	72000030060	300.0	300.0
SR 72 (RÜ300/R300) right	72000030062	300.0	300.0

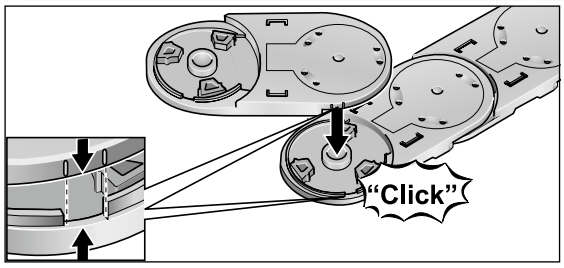
Guide channels (VAW)


VAW

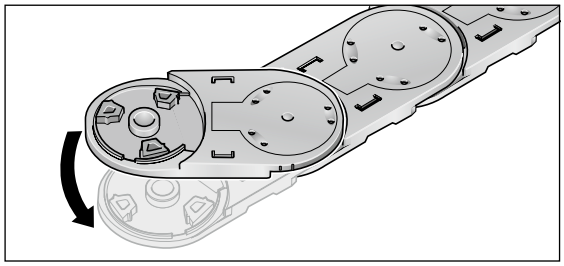

VAW-E

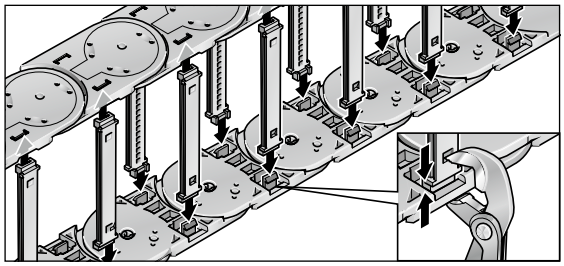
For this cable drag chain, a range of variable guide channel systems are available, constructed from aluminium or stainless steel sections.
The variable guide channel ensures that the cable drag chain is supported and guided securely.
For help on choosing, please consult the chapter „Variable Guide Channel System“.

Assembly

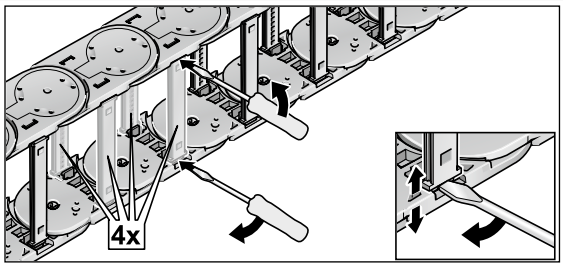


Step 1

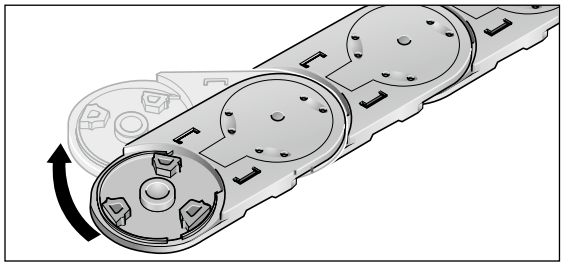

Step 2

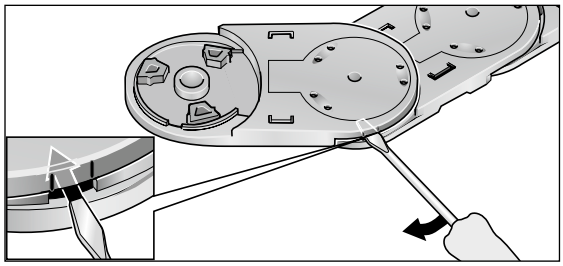

Step 3

Disassembly

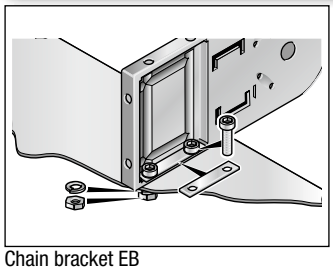


Step 1


Step 2

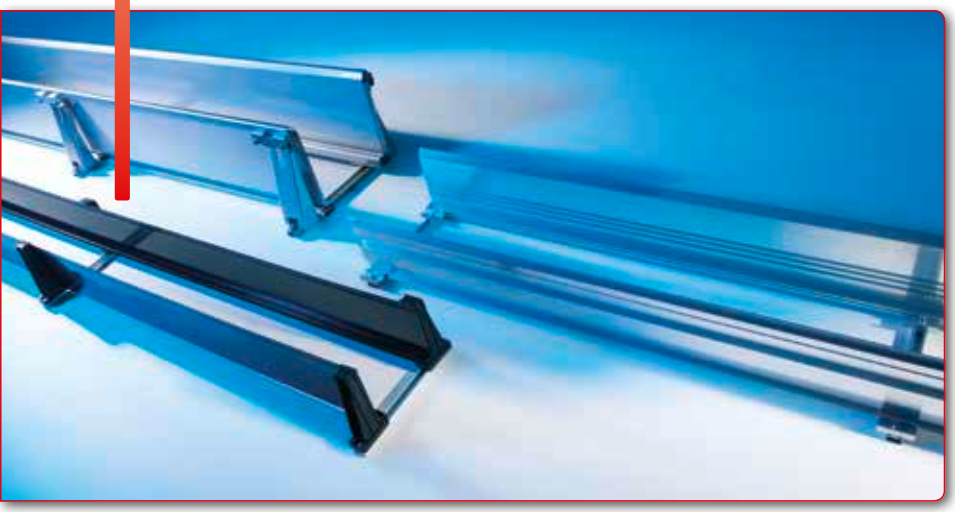

Step 3

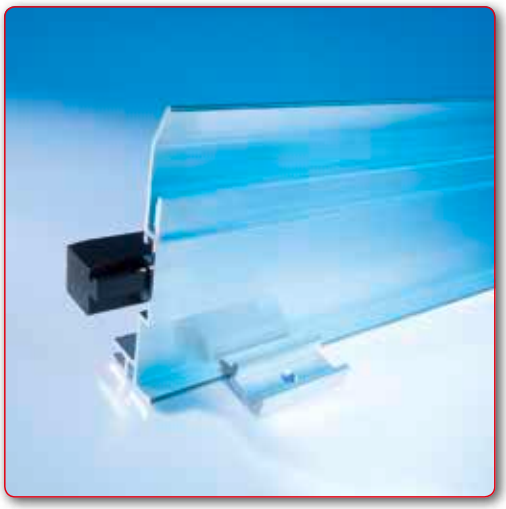
Assembly instruction flexible chain bracket


Chain bracket EB

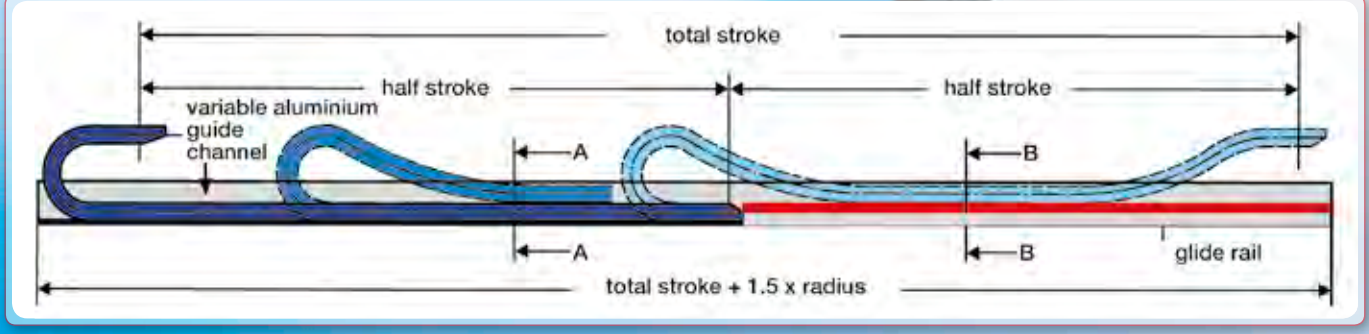
The flexible chain bracket is delivered with insert panels to prevent cold flow by the plastic.

Variable guide channel systems





VAW Variable guide channel systems



All versions of our guide channel systems for cable drag chains are used as stacking for short travel distances and also as guide channels for long travel distances.

If a guide channel is not used, the chain links cannot be guaranteed to stack properly. This is especially true for large bend radii as the side guidance does not exist.

The combination of the individual VAW type aluminium channel sides, the integrated groove system and the glide rail sections forms an extremely variable guide channel system which provides a safe, stable and visually appealing chain guide system requiring few accessories. In combination with fixing elements on the inside, the VAW type makes installation highly space-saving.

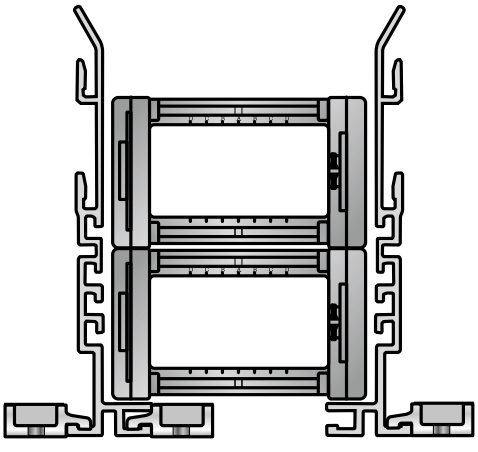
Our guide channels from steel (type VAW-Z) and stainless steel (type VAW-E) are an excellent choice for more demanding mechanical requirements. We can also supply V4a models on request for saltwater applications.

In most applications the cables enter the chain at a position central to the travel. This gives the shortest length of chain. In this case the chain is about half as long as the travel distance.
If the chain is moved to the left (see illustration below) it simply rolls in the channel.

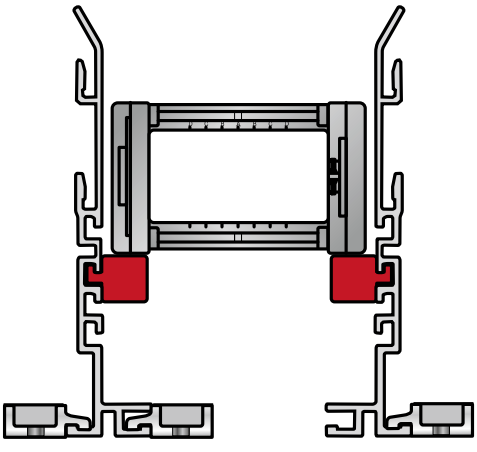
If it is moved to the right, then it stacks on top of itself once the unsupported length has been exceeded (see cross-section A-A).

If the travel veers further to the right, then the glide rail compensates for the height difference of the chain link, thus ensuring low friction (see cross-section B-B).

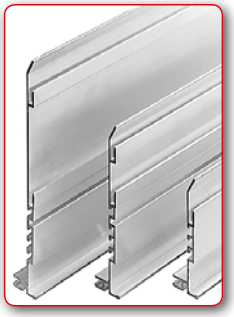
As such, optimal running of the cable drag chain is guaranteed at all times.



Cross-section A–A: *The cable drag chain glides on itself.*

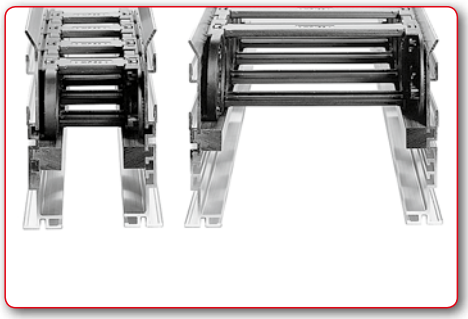


Cross-section B–B: *The cable drag chain runs on the glide rail section.*

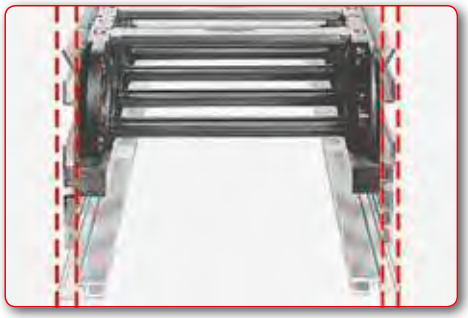
Compatible profile

A variable guide channel system is required if the self-supporting length of a cable drag chain is exceeded. The system parts comprise a range of sections and materials. Each one is structurally tailored to the Murrplastik cable drag chain systems. The use of highly durable aluminium (VAW) or stainless steel (VAW-E) makes corrosion protection unnecessary.



Variable in the chain widths and heights

Our guide channel sections can be modified to fit a range of chain types and chain widths.



Minimal space requirements

The deployment of our variable aluminium guide channel systems requires very little space. If inside clamping is used, the complete system is barely wider than the cable drag chain itself.


Simple handling

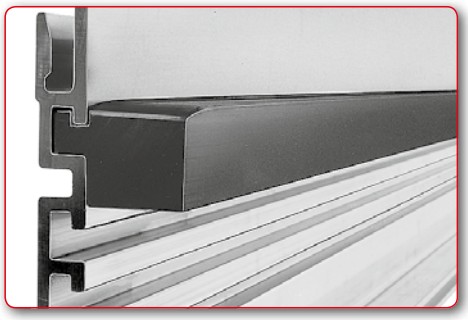
The glide rail is simply slid into the guide channel section. Optionally, the construction is then secured with a screw in the first and last guide rail.

Centre piece VAW-MT

If multiple cable drag chains need to be routed in parallel, past one another or separately from one another, then the guide channel centre piece is used for our aluminium models. It enables the secure, separated routing of cable drag chains past/next to one another and chains can also be of different dimensions.

Lower friction – less motive force

Low-friction glide rails support the cable drag chain outside the self-supporting area. Frictional forces can be lowered even further by deploying roller wheels (also available as an ATEX model). This can result in further reductions to the motive power required for the cable drag chain.

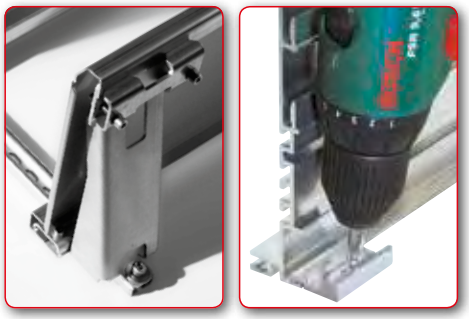


Low noise level

The glide rail's guide groove creates a level surface for the chain to run on. This guarantees snag-free gliding for the cable drag chains over the entire travel distance. The noise level is decreased. The integration of rubber dampening elements (available in two designs) on the cable drag chain's stacking surfaces can further reduce the noise level.

Accurate and snag-free alignment

No screwing or welding is required for the individual sections in our variable guide channel system. For aluminium channels, the channel sections are perfectly aligned thanks to special plastic connectors that are snap-fit into a specially-designed groove. For (stainless) steel and plastic channels, special channel brackets are used for this purpose.



Fast installation

The variable guide channel systems are fixed in place with special clamping pieces. When installing the aluminium models, the mounting holes of the clamping pieces can be used as drill templates.

Cost-effective

The use of standard components enables cost savings of up to 70% in comparison to conventional systems.

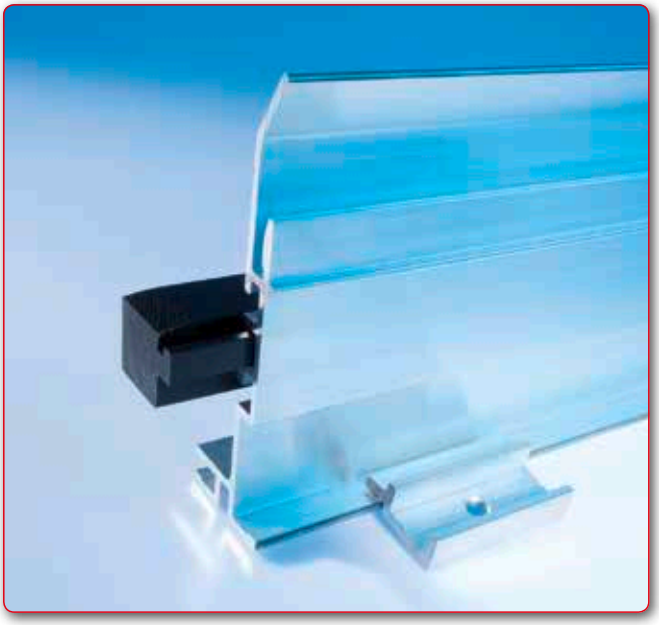
Selection criteria

Variable in the chain widths and heights

The basic idea in designing the VAW variable guide channel system has been to develop a profile that fits various types and widths of cable drag chains. In addition, the whole installation procedure was to be as simple as possible.

Each profile contains various grooves into which you may enter a gliding rail. The type of cable drag chain determines into which groove you must enter the gliding rail.

The tables given on the following pages provide a quick summary of the VAW guide channel system suitable for each type of cable drag chain.



Layout

Information on the following parameters is required for the correct layout of a variable guide channel system:

- Cable drag chain type (width, radius, installation)
- Travel distance
- Chain contents/weight per metre
- Speed of travel
- Acceleration/retardation
- Lateral acceleration yes/no
- Environmental influences

It is advisable to use a guide channel system for the entire travel distance.

If the cable entry is at the centre of the traverse, then a glide rail is required of a length equal to half of the travel distance.

Lowered fixing point

With longer travel distances, it may be advisable in some cases to lower the height of the moving end bracket.

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

Please contact our application engineers!

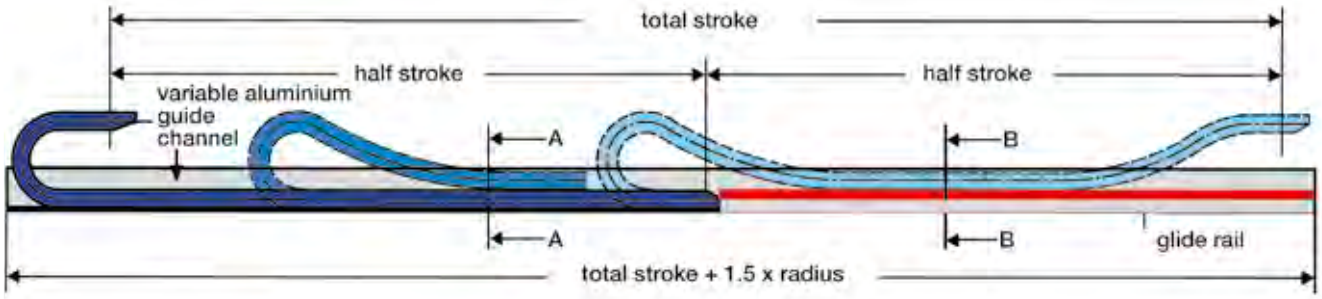
Sample calculation:

Travel distance:	20 m
Entry point:	At centre of travel distance
Chain type:	MP 35086 R 100 without bias with 176 links = 10.2 m

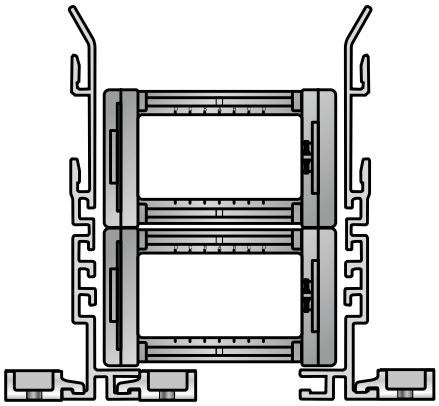
Suitable VAW system parts:

40 m guide channel VAW 80106 (20 m/side)
20 m glide rail GSP 20/20 (10 m/side)

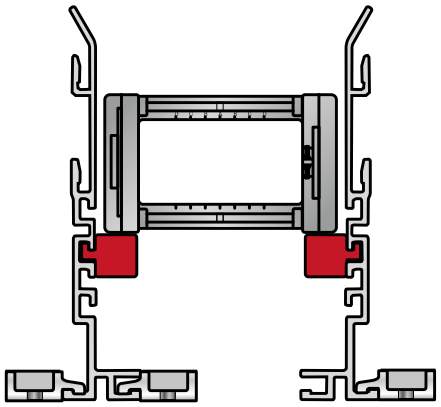
Design / structure



VAW longitudinal cross-section: *The gliding behaviour of the cable drag chain over the entire travel distance.*



Cross-section A–A: *The cable drag chain runs on itself.*



Cross-section B–B: *The cable drag chain runs on the glide rail.*

Guide to system design

To properly install the guide channel, a level support surface is required. The channel elements (standard length of 2 m) are arranged one after the other.

The guide channels are connected to each other on the outside contour by means of longitudinal connectors. This eliminates any offset and impact. The method of assembly also prevents any inherent deformation of the channel.

The guide channel inside width should exceed the chain outside width by 3 to 12 mm, depending on chain type (see Channel Clearance Table, page 304).

Clamping pieces are used to secure the guide channel sections directly to the base construction (e. g. the ground or support arms) or to C-rails.

This clamping should occur from the inside or additionally from the outside if necessary. The holes in the clamping pieces are used as drill templates. They are easily accessible with a hand drill.

If the self-supporting length of the chain is exceeded, for the part of the guide channel where the upper run cannot glide on the lower, a glide rail must be used (see cross-section B-B).

The GSP glide rail does not require screws, apart from in the first and last rail. Depending on the type of chain, the glide rail section is inserted into the guide channel groove provided. The continuous guide groove provides an even surface. This enables the chain system to run smoothly , even at high travel speeds.

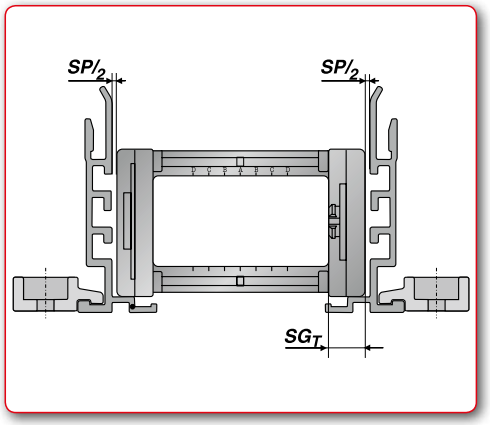
Channel clearance SP and temperature factors

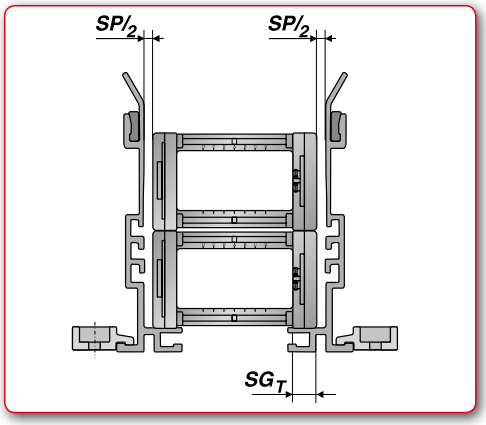
Chain type	Channel clearance SP
MP 10	3 mm
MP 14	3 mm
MP 15	3 mm
MP 18	3 mm
MP 25	4 mm
MP 25 G	4 mm
MP 30	4 mm
MP 32	6 mm
MP 32.2	6 mm
MP 32.3	6 mm
MP 35	4 mm
MP 36 G	4 mm
MP 41	8 mm
MP 41.2	8 mm
MP 41.3	8 mm
MP 43 G	8 mm
MP 44	8 mm
MP 52.1	8 mm
MP 52.2	8 mm
MP 52.3	8 mm
MP 62.1	8 mm
MP 62.2	8 mm
MP 62.3	8 mm
MP 65 G	8 mm
MP 66	8 mm
MP 72	8 mm
MP 82.2	12 mm
MP 82.3	12 mm
MP 102	12 mm
MP 3000	4 mm

Channel clearance

As a general rule, there must be enough clearance (SP) between the channel and the cable drag chain to prevent the chain ever jamming in the channel during the process cycle.

Possible consequences include shortened useful life through increased wear, plus increased running noise. Please consult the adjacent table for recommended values for your application.

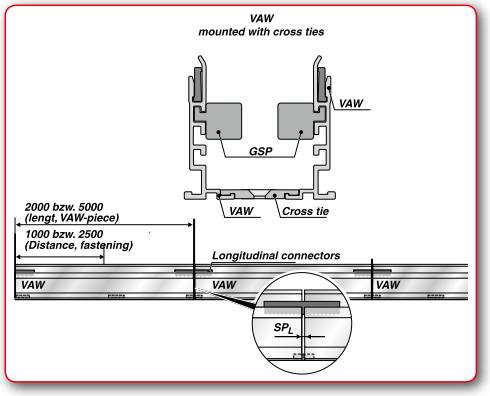


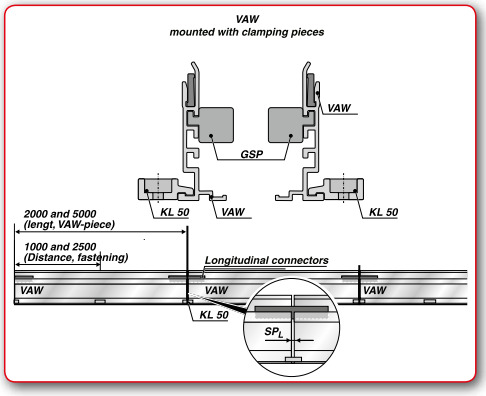


Temperature factors

Having the channel side sections "floating" by using a clamping piece (KL) or cross tie (DBP) compensates for possible longitudinal expansion caused by temperature fluctuations. The channel sections can move slightly in the longitudinal direction.

Accordingly, channel parts must be assembled using an expansion joint. The exact joint dimensions depend on the temperature fluctuations experienced during use and the length of the side sections used. Please contact our application engineers!





Selection of the matching VAW guide channel system

VAW selection for self-supporting applications

Chain type	Radius mm	VAW plastic from page		VAW aluminium from page		VAW-E stainless steel VAW-Z steel from page	
MP 10.1	– –	– –		– –		– –	
MP 14	25–75	VAWK-120	p. 308	VAW 25	p. 311	– –	
MP 15	25–75	VAWK-120	p. 308	VAW 25	p. 311	– –	
MP 18	28–78	VAWK-120	p. 308	VAW 25	p. 311	– –	
MP 25	50–300	VAWK-120	p. 308	VAW 35	p. 312	VAW-E 120/VAW-Z 120	p. 330
MP 25 G	60–250	VAWK-120	p. 308	VAW 35	p. 312	VAW-E 120/VAW-Z 120	p. 330
MP 30	60–300	VAWK-120	p. 308	VAW 35	p. 312	VAW-E 120/VAW-Z 120	p. 330
MP 32	80–250			VAW 106	p. 317	VAW-E 120/VAW-Z 120	p. 330
MP 32.2	80–250			VAW 106	p. 317	VAW-E 120/VAW-Z 120	p. 330
MP 32.3	120–250			VAW 106	p. 317	VAW-E 120/VAW-Z 120	p. 330
MP 35	70–300			VAW 35	p. 312	VAW-E 120/VAW-Z 120	p. 330
MP 36 G	80–200			VAW 35	p. 312	VAW-E 120/VAW-Z 120	p. 330
MP 41	80–600			VAW 122	p. 318	VAW-E 120/VAW-Z 120	p. 330
MP 41.2	80–600			VAW 122	p. 318	VAW-E 120/VAW-Z 120	p. 330
MP 41.3	96–600			VAW 122	p. 318	VAW-E 120/VAW-Z 120	p. 330
MP 43 G	125–250			VAW 122	p. 318	VAW-E 120/VAW-Z 120	p. 330
MP 44	70–600			VAW 122	p. 318	VAW-E 120/VAW-Z 120	p. 330
MP 52.1	100–350			VAW 122	p. 318	VAW-E 120/VAW-Z 120	p. 330
MP 52.2	100–350			VAW 122	p. 318	VAW-E 120/VAW-Z 120	p. 330
MP 52.3	150–350			VAW 122	p. 318	VAW-E 120/VAW-Z 120	p. 330
MP 62.1	150–500			VAW 122	p. 318	VAW-E 120/VAW-Z 120	p. 330
MP 62.2	150–500			VAW 122	p. 318	VAW-E 120/VAW-Z 120	p. 330
MP 62.3	200–500			VAW 122	p. 318	VAW-E 120/VAW-Z 120	p. 330
MP 65 G	200–350			VAW 122	p. 318	VAW-E 120/VAW-Z 120	p. 330
MP 66	150–350			VAW 122	p. 318	VAW-E 120/VAW-Z 120	p. 330
MP 66	150–350			VAW 122	p. 318	VAW-E 120/VAW-Z 120	p. 330
MP 72	150–500			VAW 122	p. 318	VAW-E 120/VAW-Z 120	p. 330
MP 82.2	150–500			VAW 150	p. 320	VAW-E 170/VAW-Z 170	p. 334
MP 82.3	200–500			VAW 150	p. 320	VAW-E 170/VAW-Z 170	p. 334
MP 102	250–500			VAW 150	p. 320	VAW-E 170/VAW-Z 170	p. 334
MP 3000	50-300	VAWK-120	p. 308	VAW 35	p. 312	VAW-E 120/VAW-Z 120	p. 330

VAW selection for gliding applications

Chain type	Radius mm	VAW plastic from page		VAW aluminium from page		VAW-E stainless steel VAW-Z steel from page	
MP 10.1	– –	– –		– –		– –	
MP 14	25–75	VAWK-120	p. 308	– –		– –	
MP 15	25–75	VAWK-120	p. 308	– –		– –	
MP 18	28–78	VAWK-120	p. 308	VAW 80	p. 314	VAW-E 120/VAW-Z 120	p. 330
MP 25	50–75			VAW 80	p. 314	VAW-E 120/VAW-Z 120	p. 330
	100–125			VAW 122	p. 318	VAW-E 120/VAW-Z 120	p. 330
	150			VAW 150	p. 320	VAW-E 170/VAW-Z 170	p. 334
	200			VAW 177	p. 322	VAW-E 170/VAW-Z 170	p. 334
	250–300			VAW 248	p. 326	VAW-E 220/VAW-Z 220	p. 338
MP 25 G	60–100			VAW 80	p. 314	VAW-E 120/VAW-Z 120	p. 330
	125–150			VAW 122	p. 318	VAW-E 120/VAW-Z 120	p. 330
	200			VAW 150	p. 320	VAW-E 170/VAW-Z 170	p. 334
	250			VAW 177	p. 322	VAW-E 170/VAW-Z 170	p. 334
MP 30	60–75			VAW 80	p. 314	VAW-E 120/VAW-Z 120	p. 330
	100–125			VAW 122	p. 318	VAW-E 120/VAW-Z 120	p. 330
	150			VAW 150	p. 320	VAW-E 170/VAW-Z 170	p. 334
	200			VAW 177	p. 322	VAW-E 170/VAW-Z 170	p. 334
	250–300			VAW 248	p. 326	VAW-E 220/VAW-Z 220	p. 338
MP 32	80–150			VAW 122	p. 318	VAW-E 120/VAW-Z 120	p. 330
	200–250			VAW 177	p. 322	VAW-E 170/VAW-Z 170	p. 334
MP 32.2	80–150			VAW 122	p. 318	VAW-E 120/VAW-Z 120	p. 330
	200–250			VAW 177	p. 322	VAW-E 170/VAW-Z 170	p. 334
MP 32.3	120–150			VAW 122	p. 318	VAW-E 120/VAW-Z 120	p. 330
MP 35	70–100			VAW 80	p. 314	VAW-E 120/VAW-Z 120	p. 330
	150			VAW 122	p. 318	VAW-E 120/VAW-Z 120	p. 330
	200			VAW 150	p. 320	VAW-E 170/VAW-Z 170	p. 334
	300			VAW 248	p. 326	VAW-E 220/VAW-Z 220	p. 338
MP 36 G	80–100			VAW 80	p. 314	VAW-E 120/VAW-Z 120	p. 330
	150			VAW 122	p. 318	VAW-E 120/VAW-Z 120	p. 330
	200			VAW 150	p. 320	VAW-E 170/VAW-Z 170	p. 334
MP 41	80–150			VAW 122	p. 318	VAW-E 120/VAW-Z 120	p. 330

(Continued on the next page)

Selection of the matching VAW guide channel system

VAW selection for gliding applications

Chain type	Radius mm	VAW plastic from page		VAW aluminium from page		VAW-E stainless steel VAW-Z steel from page	
MP 41	200	VAW 150	p. 320	VAW-E 170/VAW-Z 170	p. 334		
	250	VAW 177	p. 322	VAW-E 170/VAW-Z 170	p. 334		
	300	VAW 248	p. 326	VAW-E 220/VAW-Z 220	p. 338		
MP 41.2	80–150	VAW 122	p. 318	VAW-E 120/VAW-Z 120	p. 330		
	200	VAW 150	p. 320	VAW-E 170/VAW-Z 170	p. 334		
	250	VAW 177	p. 322	VAW-E 170/VAW-Z 170	p. 334		
MP 41.2	300	VAW 248	p. 326	VAW-E 220/VAW-Z 220	p. 338		
MP 41.3	96–150	VAW 122	p. 318	VAW-E 120/VAW-Z 120	p. 330		
	200	VAW 150	p. 320	VAW-E 170/VAW-Z 170	p. 334		
	250	VAW 177	p. 322	VAW-E 170/VAW-Z 170	p. 334		
	300	VAW 248	p. 326	VAW-E 220/VAW-Z 220	p. 338		
MP 43 G	125–150	VAW 122	p. 318	VAW-E 120/VAW-Z 120	p. 330		
	200	VAW 150	p. 320	VAW-E 170/VAW-Z 170	p. 334		
	250	VAW 177	p. 322	VAW-E 170/VAW-Z 170	p. 334		
MP 44	70–150	VAW 80	p. 314	VAW-E 120/VAW-Z 120	p. 330		
	200	VAW 150	p. 320	VAW-E 170/VAW-Z 170	p. 334		
	250	VAW 177	p. 322	VAW-E 170/VAW-Z 170	p. 334		
MP 52.1	100–150	VAW 122	p. 318	VAW-E 120/VAW-Z 120	p. 330		
	200–250	VAW 177	p. 322	VAW-E 170/VAW-Z 170	p. 334		
	300	VAW 248	p. 326	VAW-E 220/VAW-Z 220	p. 338		
MP 52.2	100–150	VAW 122	p. 318	VAW-E 120/VAW-Z 120	p. 330		
	200–250	VAW 177	p. 322	VAW-E 170/VAW-Z 170	p. 334		
	300	VAW 248	p. 326	VAW-E 220/VAW-Z 220	p. 338		
MP 52.3	150	VAW 122	p. 318	VAW-E 120/VAW-Z 120	p. 330		
	200–250	VAW 177	p. 322	VAW-E 170/VAW-Z 170	p. 334		
	300	VAW 248	p. 326	VAW-E 220/VAW-Z 220	p. 338		
MP 62.1	150–250	VAW 177	p. 322	VAW-E 170/VAW-Z 170	p. 334		
	300–500	VAW 248	p. 326	VAW-E 220/VAW-Z 220	p. 338		
MP 62.2	150–250	VAW 177	p. 322	VAW-E 170/VAW-Z 170	p. 334		
	300–500	VAW 248	p. 326	VAW-E 220/VAW-Z 220	p. 338		
MP 62.3	200–250	VAW 177	p. 322	VAW-E 170/VAW-Z 170	p. 334		

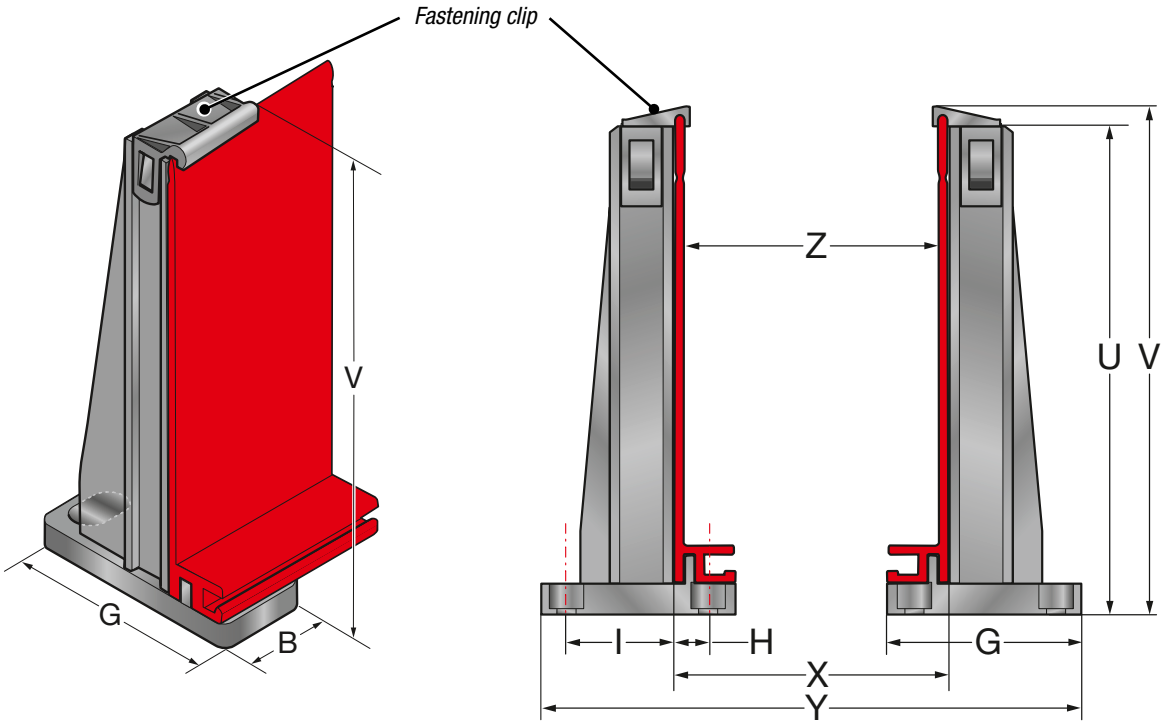
(Continued on the next page)

Which VAW guide channel system matches my cable drag chain?

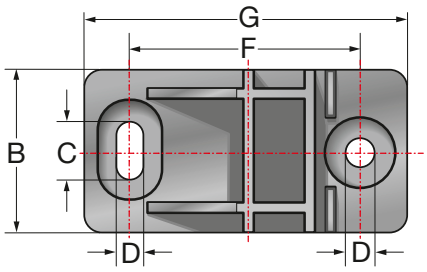
VAW selection for gliding applications

Chain type	Radius mm	VAW plastic from page		VAW aluminium from page		VAW-E stainless steel VAW-Z steel from page	
	300–500			VAW 248	p. 326	VAW-E 220/VAW-Z 220	p. 338
MP 65 G	200–240			VAW 177	p. 322	VAW-E 170/VAW-Z 170	p. 334
	280–350			VAW 248	p. 326	VAW-E 220/VAW-Z 220	p. 338
MP 66	150–240			VAW 177	p. 322	VAW-E 170/VAW-Z 170	p. 334
	280–350			VAW 248	p. 326	VAW-E 220/VAW-Z 220	p. 338
MP 72	150–500			VAW 248	p. 326	VAW-E 220/VAW-Z 220	p. 338
MP 82.2	150–500			VAW 248	p. 326	VAW-E 220/VAW-Z 220	p. 338
MP 82.3	200–500			VAW 248	p. 326	VAW-E 220/VAW-Z 220	p. 338
MP 102	250–500			VAW 248	p. 326	VAW-E 220/VAW-Z 220	p. 338
MP 3000	50–95	VAWK-120	p. 308	VAW 80	p. 314	VAW-E 120/VAW-Z 120	p. 330
	120–150	VAWK-120	p. 308	VAW 122	p. 318	VAW-E 120/VAW-Z 120	p. 330
	200			VAW 150	p. 320	VAW-E 170/VAW-Z 170	p. 334
	300			VAW 248	p. 326	VAW-E 220/VAW-Z 220	p. 338

Variable guide channel system, type VAWK-120



Guide channel side section	
Type	VAWK-120
Length	2000 mm
Order no.	111490100700



Channel bracket type WHK-120

includes fastening clip

Order no.: 111210400000

A = – –
B = 35 mm
C = 12 mm
D = 6.6 mm
E = – –
F = 53 mm
G = 70.15 mm

AB = Chain outside width
SP = Channel clearance*

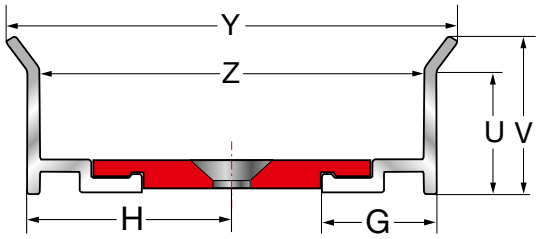
Z = AB + SP
Y = AB + SP + 108.5 mm
X = AB + SP + 5 mm

V = 147 mm
U = 142 mm

G = 70.15 mm
H = 11.15 mm
I = 42 mm

** See page 304 for further details of channel clearance (SP)*

Variable guide channel system, type VAW 25, one-piece inside clamping



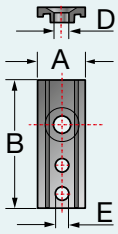
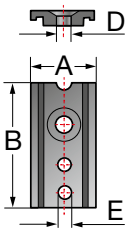
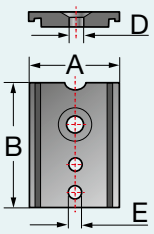
One-piece inside clamping:
the channel side sections on both sides are secured to the mounting surface using a clamping piece.

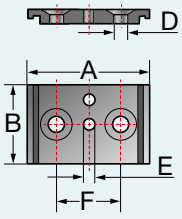
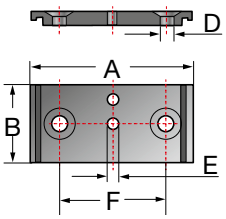
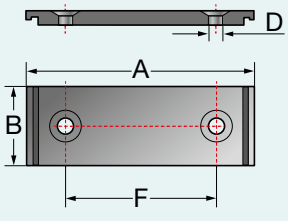
Z = See VAW-DBP table
Y = VAW 25 outside width for one-piece inside clamping

V = 25 mm
U = 20 mm
G = 10.7 mm
H = See VAW-DBP table

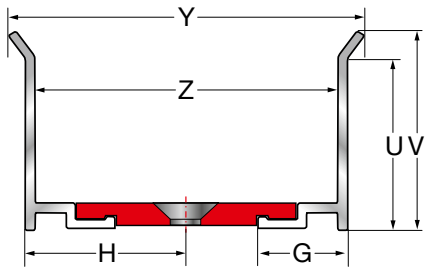
See page 304 for further details of channel clearance (SP)

	Guide channel side section
Type	VAW 25
Length	2000 mm
Order no.	1114101907004

Distance fixing plate	VAW-DBP 14016	VAW-DBP 1420/18018	VAW-DBP 1430/18025
Dimensional drawing			
Order no.	111212220000	111212240000	111212260000
Dimensions in mm	A = 14.0 B = 37.0	A = 18.8 B = 37.0	A = 27.2 B = 37.0
Ø Bore holes / spacing in mm	D = 5.2 E = 4.2	D = 5.2 E = 4.2	D = 5.2 E = 4.2
Channel dimensions	Z = 26.0 Y = 34.0 H = 14.2	Z = 31.0 Y = 39.0 H = 16.6	Z = 39.0 Y = 47.0 H = 20.8
suitable for CDC types with outside widths	from 22 to 24 mm	from 27 to 29 mm	from 35 to 37 mm

Distance fixing plate	VAW-DBP 14040/18037	VAW-DBP 14050/18050	VAW-DBP 18070
Dimensional drawing			
Order no.	111212280000	111212300000	111212320000
Dimensions in mm	A = 38.2 B = 25.0	A = 51.7 B = 25.0	A = 71.9 B = 25.0
Ø Bore holes / spacing in mm	D = 5.2 ¦ E = 3.5 ¦ F = 20.0	D = 5.2 ¦ E = 3.5 ¦ F = 34.0	D = 5.2 F = 48.0
Channel dimensions	Z = 50.0 Y = 58.0 H = 16.3	Z = 64.0 Y = 72.0 H = 16.05	Z = 84.0 Y = 92.0 H = 19.1
suitable for CDC types with outside widths	from 46 to 48 mm	from 60 to 62 mm	from 80 to 82 mm

Variable guide channel system, type VAW 35, one-piece inside clamping



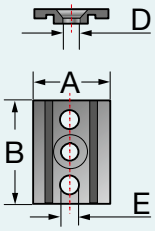
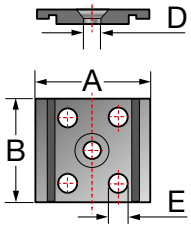
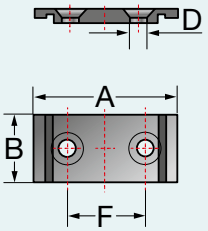
One-piece inside clamping:
the channel side sections on both sides are secured to the mounting surface using a clamping piece.

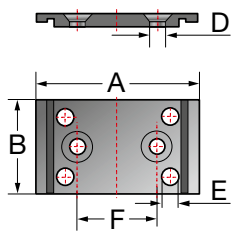
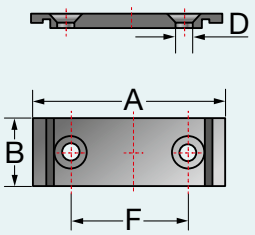
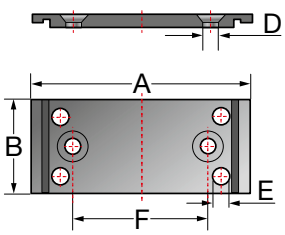
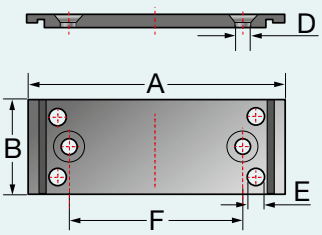
Z = See VAW-DBP table
Y = VAW outside width for one-piece inside clamping

V = 35 mm
U = 30 mm
G = 18 mm
H = See VAW-DBP table

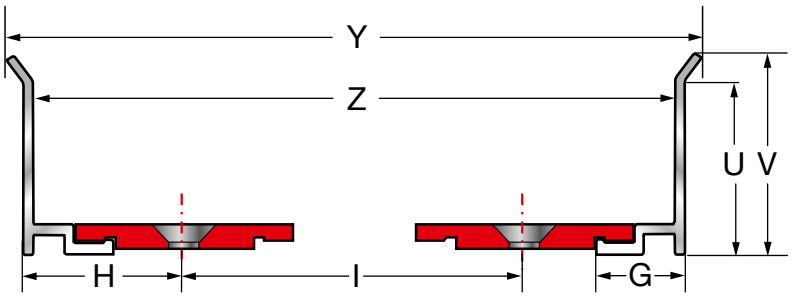
See page 304 for further details of channel clearance (SP)

	Guide channel side section
Type	VAW 35
Length	2000 mm
Order no.	111420100700

Distance fixing plate	VAW-DBP 3001	VAW-DBP 3002	VAW-DBP 3002.5
Dimensional drawing			
Order no.	111212100000	111212120000	111212130000
Dimensions in mm	A = 30.0 B = 40.0	A = 43.5 B = 40.0	A = 62.0 B = 30.0
Ø Bore holes / spacing in mm	D = 6.2 E = 6.5	D = 6.2 E = 6.5	D = 6.2 F = 34.0
Channel dimensions	Z = 46.0 Y = 56.0 H = 25.1	Z = 60.0 Y = 70.0 H = 31.8	Z = 78.0 Y = 88.0 H = 24.1
suitable for CDC types with outside widths	from 42 to 44 mm	from 53 to 57 mm	from 72 to 75 mm

VAW-DBP 3003/35062	VAW-DBP 3003.5	VAW-DBP 3004/35086	VAW-DBP 3005/35102
			
111212140000	111212150000	111212160000	111212180000
A = 68.0 B = 40.0	A = 82.0 B = 30.0	A = 93.5 B = 40.0	A =109.6 B = 40.0
D = 6.2 ¦ E = 6.5 ¦ F = 34.0	D = 6.2 F = 50.0	D = 6.2 ¦ E = 6.5 ¦ F = 58.5	D = 6.2 ¦ E = 6.5 ¦ F = 73.5
Z = 84.0 Y = 94.0 H = 27.1	Z = 98.0 Y =108.0 H = 26.1	Z =110.0 Y =120.0 H = 27.6	Z =126.0 Y =136.0 H = 28.1
from 76 to 82 mm	from 91 to 95 mm	from 101 to 107 mm	from 116 to 123 mm

Variable guide channel system, type VAW 35, two-part inside clamping



	Guide channel side section
Type	VAW 35
Length	2000 mm
Order no.	111420100700

Examples for two-part inside clamping with clamping piece type VAW-DBP 3001				
Channel dimensions	Z =149.0 I =103.0	Y =159.0	Z =151.0 I =178.0	Y =161.0
Sample applications: (IB = Inside width in mm) (AB = Outside width in mm)	MP 25 (IB = 125, AB = 141) MP 36 G (IB = 125, AB = 141)		MP 3000 (IB = 125, AB = 143)	

Examples for two-part inside clamping with clamping piece type VAW-DBP 3001				
Channel dimensions	Z =174.0 I =128.0	Y =184.0	Z =224.0 I =128.0	Y =234.0
Sample applications: (IB = Inside width in mm) (AB = Outside width in mm)	MP 25 (IB = 150, AB = 166)		MP 25 (IB = 200, AB = 216)	

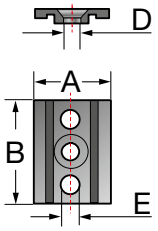
Two-part inside clamping:
The channel side sections are secured to the mounting surface using two clamping pieces of the same type.

Z = Chain outside width + SP*
Z_{Min} = 77 mm**
Y = Z + 10 mm
I = Z - 46 mm
V = 35 mm
U = 30 mm
G = 18 mm
H = 25.1 mm

* *See page 304 for further details of channel clearance (SP)*

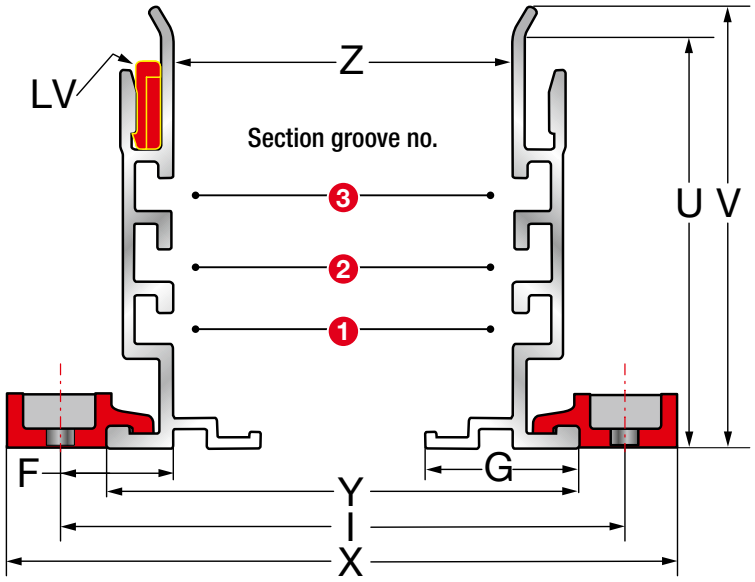
** *Smallest channel inside width for two-part inside clamping. Smaller inside widths are possible only with one-piece inside clamping.*

Clamping piece type VAW-DBP 3001



Order no.: 111212100000
A =30.0 mm
B =40.0 mm
D = 6.2 mm
E = 6.5 mm

Variable guide channel system, type VAW 80, outside clamping



Outside clamping:
The channel side sections are secured to the mounting surface outside using two type KL 50 clamping pieces.

AB = Chain outside width
SP = Channel clearance*

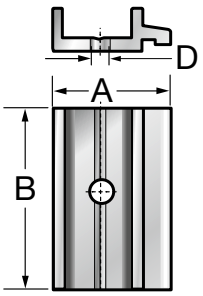
Z = AB + SP
Y = AB + SP + 24 mm
X = AB + SP + 70 mm
V = 80 mm
U = 74 mm
I = Z + 2*F = Z + 47 mm
F = 23.5 mm
G = 28.0 mm

* *See page 304 for further details of channel clearance (SP)*

	Guide channel side section
Type	VAW 80
Length	2000 mm
Order no.	111430100700

	Longitudinal connectors
Type	LV
	
Order no.	111210100000

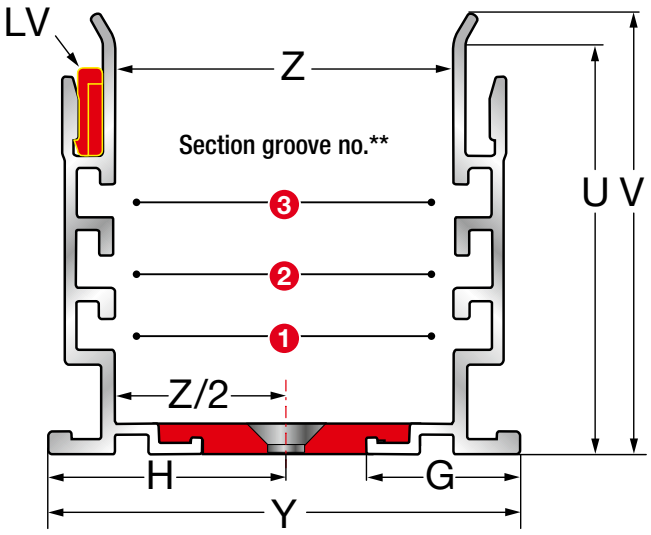
Clamping piece type KL 50



Order no.: 111210300000
A =32.4 mm
B =50.0 mm
D = 6.2 mm

Glide rail section		GSP 20/20	GSP 20/24
			
Order no.		111010100000	111010140000
	For use with in connection with cable drag chains of these types		
Installation of glide rail in section groove number	1	MP 18	– –
	2	MP 25 G, MP 3000	MP 30
	3	MP 35, MP 36 G	– –

Variable guide channel system, type VAW 80, one-piece inside clamping



One-piece inside clamping:
the channel side sections on both sides are secured to the mounting surface using a clamping piece.

AB = Chain outside width
SP = Channel clearance*

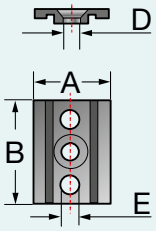
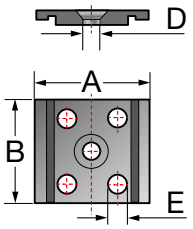
Z = AB + SP
Y = AB + SP + 24 mm
X = AB + SP + 70 mm
V = 80 mm
U = 74 mm
I = Z + 2*H = Z + 47 mm
H = 23.5 mm
G = 28.0 mm

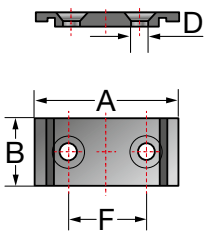
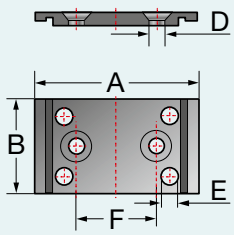
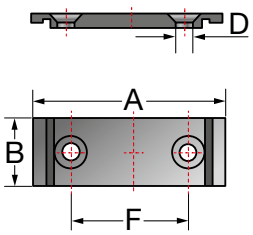
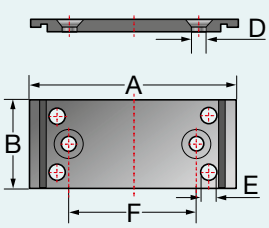
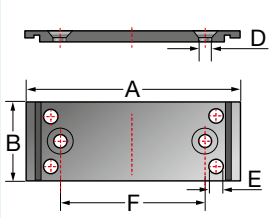
* *See page 304 for further details of channel clearance (SP)*

** *See page 314 for further details of section groove numbers*

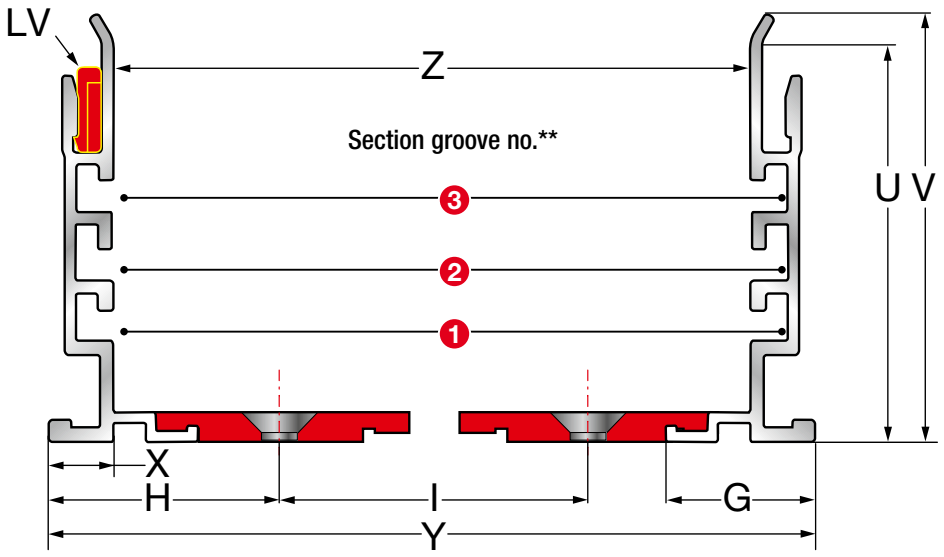
	Guide channel side section
Type	VAW 80
Length	2000 mm
Order no.	111430100700

	Longitudinal connectors
Type	LV
	
Order no.	111210100000

DBP type	VAW-DBP 3001	VAW-DBP 3002
Dimensional drawing		
Order no.	111212100000	111212120000
Dimensions in mm	A = 30.0 B = 40.0	A = 43.5 B = 40.0
Ø hole / spacing in mm	D = 6.2 E = 6.5	D = 6.2 E = 6.5
Channel dimensions	Z = 46.0 H = 35.5	Z = 60.0 H = 41.9
suitable for CDC types with outside widths	from 42 to 44 mm	from 53 to 57 mm

VAW-DBP 3002.5	VAW-DBP 3003/35062	VAW-DBP 3003.5	VAW-DBP 3004/35086	VAW-DBP 3005/35102
				
111212130000	111212140000	111212150000	111212160000	111212180000
A = 62.0 B = 30.0	A = 68.0 B = 40.0	A = 82.0 B = 30.0	A = 93.0 B = 40.0	A = 109.0 B = 40.0
D = 6.2 F = 34.0	D = 6.2 ¦ E = 6.5 ¦ F = 50.0	D = 6.2 F = 50.0	D = 6.2 ¦ E = 6.5 ¦ F = 58.5	D = 6.2 ¦ E = 6.5 ¦ F = 73.5
Z = 78.0 H = 34.1	Z = 84.0 H = 36.1	Z = 98.0 H = 37.1	Z = 110.0 H = 37.6	Z = 126.0 H = 38.2
from 72 to 75 mm	from 76 to 82 mm	from 91 to 95 mm	from 101 to 107 mm	from 116 to 123 mm

Variable guide channel system, type VAW 80, two-part inside clamping



	Guide channel side section
Type	VAW 80
Length	2000 mm
Order no.	111430100700

	Longitudinal connectors
Type	LV
	
Order no.	111210100000

Two-part inside clamping:
The channel side sections are secured to the mounting surface using two clamping pieces of the same type.

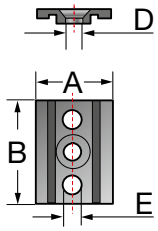
- Z = Chain outside width + SP*
- Z_{Min} = 77 mm***
- Y = Z + 25 mm
- I = Z - 46 mm
- X = 12.5 mm
- V = 35 mm
- U = 30 mm
- G = 18 mm
- H = 25.1 mm

* *See page 304 for further details of channel clearance (SP)*

** *See page 314 for further details of section groove numbers*

*** *Smallest channel inside width for two-part inside clamping. Smaller inside widths are possible only with one-piece inside clamping.*

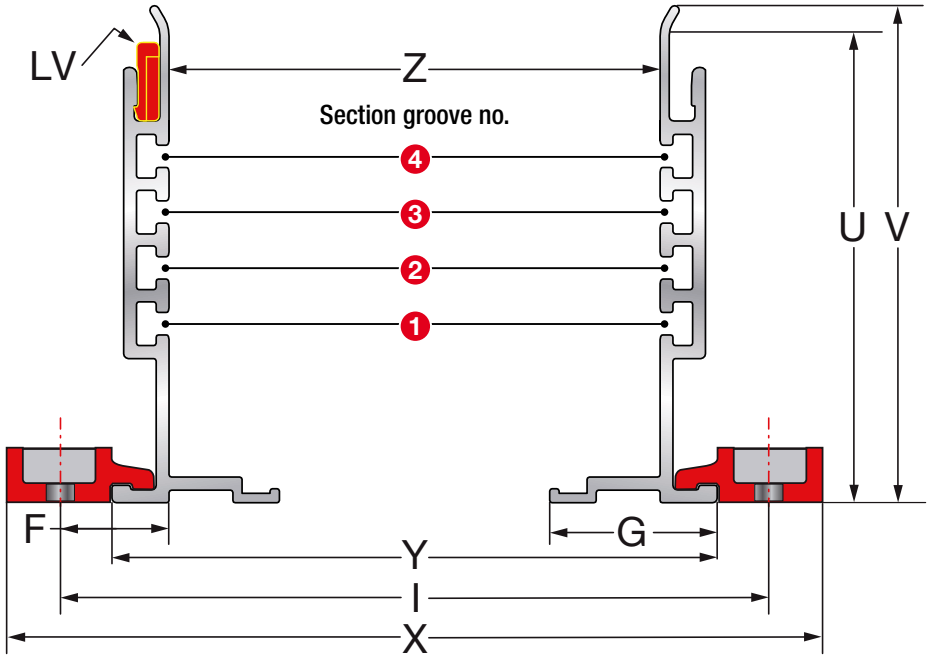
Clamping piece type VAW-DBP 3001



Order no.: 111212100000

- A =30.0 mm
- B =40.0 mm
- D = 6.2 mm
- E = 6.5 mm

Variable guide channel system, type VAW 106, outside clamping



Outside clamping:
The channel side sections are secured to the mounting surface outside using two type KL 50 clamping pieces.

AB = Chain outside width
SP = Channel clearance*

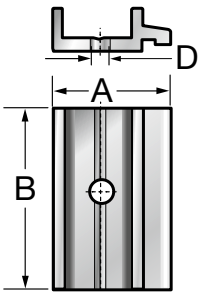
Z = AB + SP
Y = AB + SP + 26 mm
X = AB + SP + 72 mm
V = 106 mm
U = 100 mm
I = Z + 2*F = Z + 49 mm
F = 24.5 mm
G = 36.7 mm

* *See page 304 for further details of channel clearance (SP)*

	Guide channel side section
Type	VAW 106
Length	2000 mm
Order no.	111435100700

	Longitudinal connectors
Type	LV
Order no.	111210100000

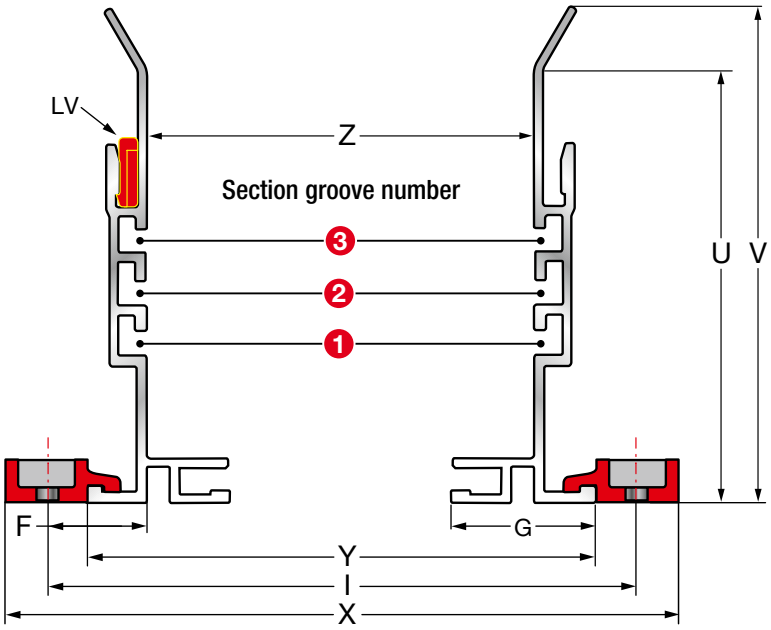
Clamping piece type KL 50



Order no.: 111210300000
A =32.4 mm
B =50.0 mm
D = 6.2 mm

Glide rail section		GSP 5/15	GSP 5/15	GSP 7/13	GSP 9/11
Order no.		111010180000	111010180000	111010200000	111010220000
	For use with in connection with cable drag chains of these types				
Installation of glide rail in section groove number	1	MP 25	MP 35, MP 36 G	– –	MP 30
	2	– –	– –	MP 32.X	– –
	3	MP 41.X, MP 43 G, MP 44	– –		
	4	MP 52.X			

Variable guide channel system, type VAW 122



Outside clamping:
The channel side sections are secured to the mounting surface outside using two type KL 50 clamping pieces.

AB = Chain outside width
SP = Channel clearance*

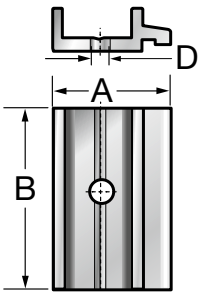
Z = AB + SP*
Y = AB + SP + 30 mm
X = AB + SP + 76 mm
V = 122 mm
U = 105 mm
I = Z + 2*F = Z + 53 mm
F = 26.5 mm
G = 35 mm

* *See page 304 for further details of channel clearance (SP)*

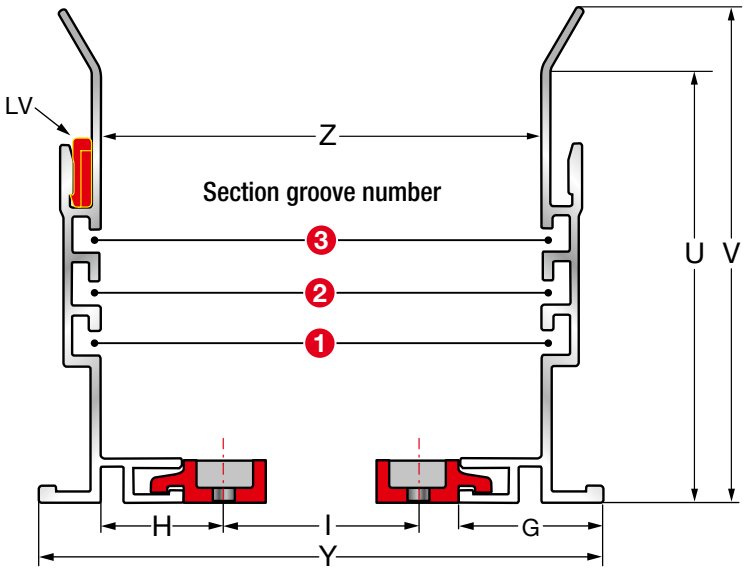
	Guide channel side section
Type	VAW 122
Length	2000 mm
Order no.	111440100700

	Longitudinal connectors	Dampening sections	
Type	LV	4 mm	9 mm
			
Order no.	111210100000	111012100001	111012100002

Clamping piece type KL 50



Order no.: 111210300000
A =32.4 mm
B =50.0 mm
D = 6.2 mm



Two-part inside clamping:
The channel side sections are secured to the mounting surface using two clamping pieces of the same type.

Z = AB + SP*
Z_{Min} = 87 mm**
Y = AB + SP + 30 mm
I = Z - 2*H = Z - 63 mm
V = 122 mm
U = 105 mm
H = 31.5 mm
G = 35 mm

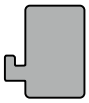
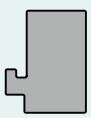
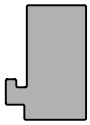
** *Smallest channel inside width for two-part inside clamping. Smaller inside widths are possible only with outside clamping.*

For explanation see Sample order

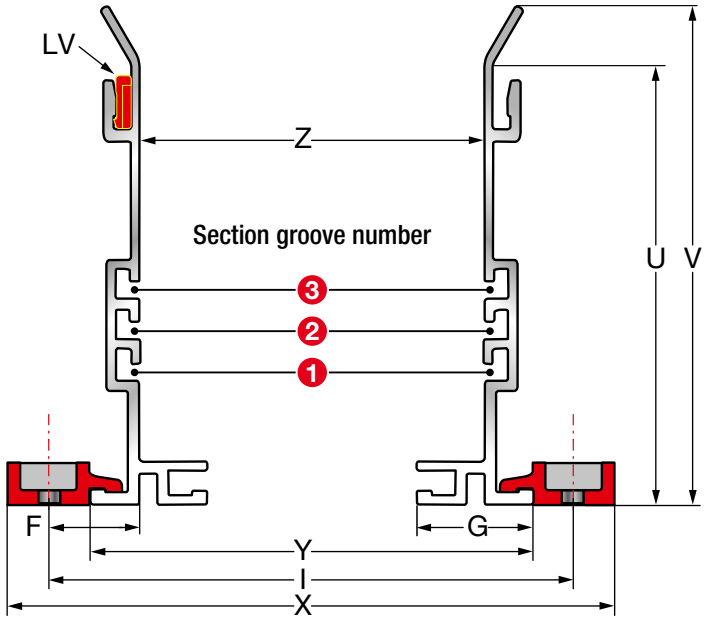
Chain type	Dampening sections: without	Dampening sections: Height 4 mm	Dampening sections: Height 9 mm	Glide rail sections: GSP 20/15	Glide rail sections: GSP 20/20	Glide rail sections: GSP 20/24	Glide rail sections: GSP 20/29	Glide rail sections: GSP 20/34	Glide rail sections: GSP 20/38	Section groove number
MP 25	●			●						1
MP 25 G		◐			◐					1
MP 3000			○	○						2
MP 30	●				●					1
		◐		◐						2
			○		○					2
MP 32	●				●					2
MP 32.2		◐		◐						3
MP 32.3			○		○					3
MP 35	●			●						2
MP 36 G		◐			◐					2
			○	○						3
MP 41.x	●			●						3
MP 43 G		◐			◐					3
MP 44			○					○		2
MP 52.x	●					●				3
		◐					◐			3
			○					○		3

Example: A cable drag chain is to be installed in a VAW 122 unit. Which glide rail needs to be installed in which section groove?

The glide rail for supporting the upper run must (after exceeding the self-supporting length) be installed in the guide channel at the right height. First, locate your application's chain type in the adjacent table (column 1). To determine the matching section groove number, you next need to decide whether or not you are planning to use a (noise) dampening section. The next three columns in the table are used for this purpose. If you then look further to the right in the table, you will find the associated glide rail section and matching section groove number for installing the glide rails.

Glide rail section	GSP 20/15	GSP 20/20	GSP 20/24	GSP 20/29	GSP 20/34	GSP 20/38
						
Order no.	111010280000	111010100000	111010140000	111010120000	111010300000	111010320000

Variable guide channel system, type VAW 150



Outside clamping:
The channel side sections are secured to the mounting surface outside using two type KL 50 clamping pieces.

AB = Chain outside width
SP = Channel clearance*

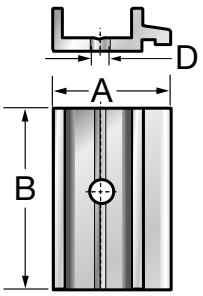
Z = AB + SP*
Y = AB + SP + 30 mm
X = AB + SP + 76 mm
V = 150 mm
U = 133 mm
I = Z + 2*F = Z + 53 mm
F = 26.5 mm
G = 35 mm

* *See page 304 for further details of channel clearance (SP)*

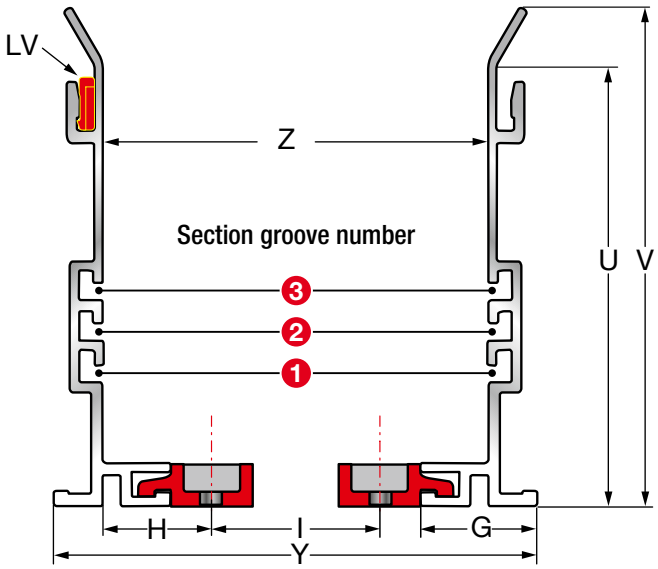
	Guide channel side section
Type	VAW 150
Length	2000 mm
Order no.	111470100700

	Longitudinal connectors	Dampening sections	
Type	LV	4 mm	9 mm
			
Order no.	111210100000	111012100001	111012100002

Clamping piece type KL 50



Order no.: 111210300000
A =32.4 mm
B =50.0 mm
D = 6.2 mm



Two-part inside clamping:
The channel side sections are secured to the mounting surface inside using two type KL 50 clamping pieces.

Z = AB + SP*
Z_{Min} = 87 mm**
Y = AB + SP + 30 mm
I = Z - 2*H = Z - 63 mm
V = 150 mm
U = 133 mm
H = 31.5 mm
G = 35 mm

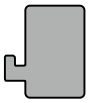
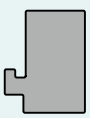
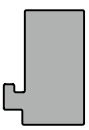
** *Smallest channel inside width for two-part inside clamping. Smaller inside widths are possible only with outside clamping.*

For explanation see Sample order

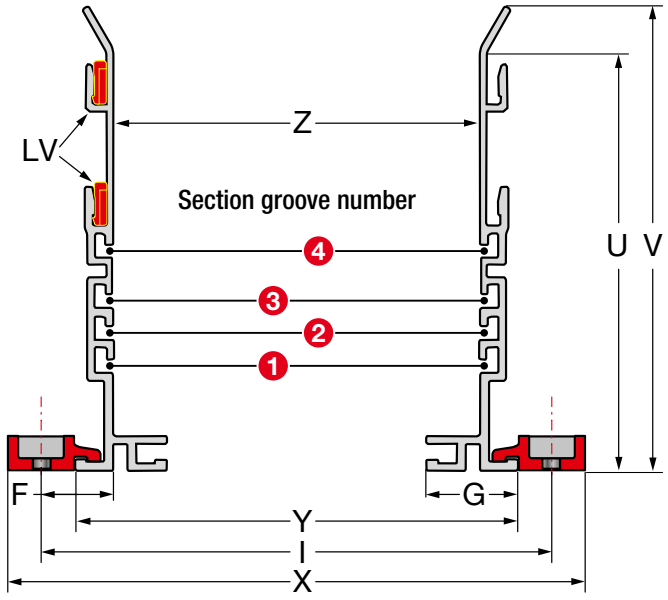
Chain type	Dampening sections: without	Dampening sections: Height 4 mm	Dampening sections: Height 9 mm	Glide rail sections: GSP 20/15	Glide rail sections: GSP 20/20	Glide rail sections: GSP 20/24	Glide rail sections: GSP 20/29	Glide rail sections: GSP 20/34	Glide rail sections: GSP 20/38	Section groove number
MP 25	●			●						1
MP 25 G		◐			◐					1
MP 3000			○	○						2
MP 30	●				●					1
		◐		◐						2
			○		○					2
MP 32	●				●					2
MP 32.2		◐		◐						3
MP 32.3			○		○					3
MP 35	●			●						2
MP 36 G		◐			◐					2
			○	○						3
MP 41.x	●			●						3
MP 43 G		◐			◐					3
MP 44			○					○		2
MP 52.x	●					●				3
		◐					◐			3
			○					○		3

Example: A cable drag chain is to be installed in a VAW 150 unit. Which glide rail section needs to be installed in which section groove?

The glide rail for supporting the upper run must (after exceeding the self-supporting length) be installed in the guide channel at the right height. First, locate your application's chain type in the adjacent table (column 1). To determine the matching section groove number, you next need to decide whether or not you are planning to use a (noise) dampening section. The next three columns in the table are used for this purpose. If you then look further to the right in the table, you will find the associated glide rail section and matching section groove number for installing the glide rails.

Glide rail section	GSP 20/15	GSP 20/20	GSP 20/24	GSP 20/29	GSP 20/34	GSP 20/38
						
Order no.	111010280000	111010100000	111010140000	111010120000	111010300000	111010320000

Variable guide channel system, type VAW 177



Outside clamping:
The channel side sections are secured to the mounting surface outside using two type KL 50 clamping pieces.

AB = Chain outside width
SP = Channel clearance*

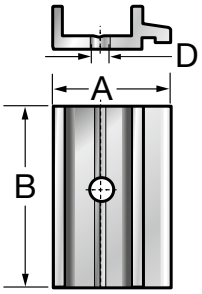
Z = AB + SP*
Y = AB + SP + 30 mm
X = AB + SP + 76 mm
V = 177 mm
U = 160 mm
I = Z + 2*F = Z + 53 mm
F = 26.5 mm
G = 35 mm

* *See page 304 for further details of channel clearance (SP)*

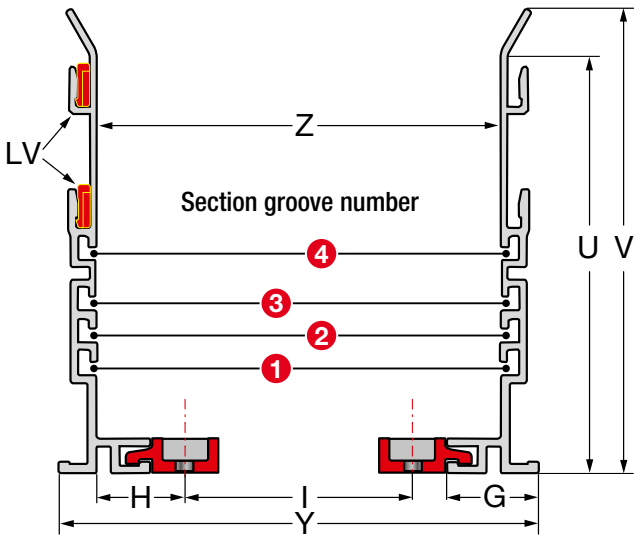
	Guide channel side section	
Type	VAW 177	VAW 177
Length	2000 mm	5000 mm
Order no.	111450100700	111450120700

	Longitudinal connectors	Dampening sections	
Type	LV	4 mm	9 mm
			
Order no.	111210100000	111012100001	111012100002

Clamping piece type KL 50



Order no.: 111210300000
A =32.4 mm
B =50.0 mm
D = 6.2 mm



Two-part inside clamping:
The channel side sections are secured to the mounting surface inside using two type KL 50 clamping pieces.

Z = AB + SP*
Z_{Min} = 87 mm**
Y = AB + SP + 30 mm
I = Z - 2*H = Z - 63 mm
V = 177 mm
U = 160 mm
H = 31.5 mm
G = 35 mm

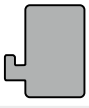
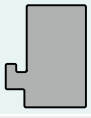
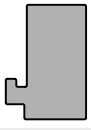
** *Smallest channel inside width for two-part inside clamping. Smaller inside widths are possible only with outside clamping.*

For explanation see Sample order

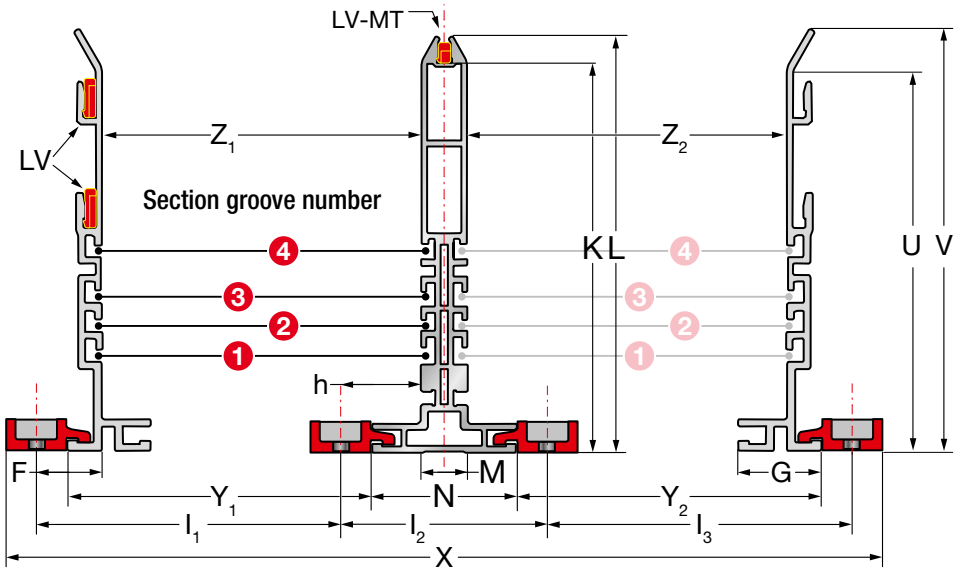
Chain type	Dampening sections: without	Dampening sections: Height 4 mm	Dampening sections: Height 9 mm	Glide rail sections: GSP 20/15	Glide rail sections: GSP 20/20	Glide rail sections: GSP 20/24	Glide rail sections: GSP 20/29	Glide rail sections: GSP 20/34	Glide rail sections: GSP 20/38	Section groove number
MP 25	●			●						1
MP 25 G		◐			◐					1
MP 3000			○	○						2
MP 30	●				●					1
		◐		◐						2
			○		○					2
MP 32	●				●					2
MP 32.2		◐		◐						3
MP 32.3			○		○					3
MP 35	●			●						2
MP 36 G		◐			◐					2
			○	○						3
MP 41.x	●			●						3
MP 43 G		◐			◐					3
MP 44			○					○		2
MP 52.x	●					●				3
		◐					◐			3
			○		○					4
MP 62.x	●				●					4
		◐					◐			4
			○					○		4
MP 65 G	●			●						4
MP 66		◐			◐					4

Example: A cable drag chain is to be installed in a VAW 177 unit. Which glide rail needs to be installed in which section groove?

The glide rail for supporting the upper run must (after exceeding the self-supporting length) be installed in the guide channel at the right height. First, locate your application's chain type in the adjacent table (column 1). To determine the matching section groove number, you next need to decide whether or not you are planning to use a (noise) dampening section. The next three columns in the table are used for this purpose. If you then look further to the right in the table, you will find the associated glide rail section and matching section groove number for installing the glide rails.

Glide rail section	GSP 20/15	GSP 20/20	GSP 20/24	GSP 20/29	GSP 20/34	GSP 20/38
						
Order no.	111010280000	111010100000	111010140000	111010120000	111010300000	111010320000

Variable guide channel system, type VAW 177, with centre piece



	Guide channel side section		Guide channel centre piece	
Type	VAW 177	VAW 177	VAW MT 177	VAW MT 177
Length	2000 mm	5000 mm	2000 mm	5000 mm
Order no.	111450100700	111450120700	111450140700	111450160700

	Longitudinal connectors		Dampening sections	
Type	LV	LV-MT	4 mm	9 mm
				
Order no.	111210100000	111210120000	111012100001	111012100002

Outside clamping:
The channel side sections are secured to the mounting surface outside using two type KL 50 clamping pieces.

AB = Chain outside width
SP = Channel clearance*

Z_1 = AB + SP*
Z_2 = AB + SP*
$Y_1 = Z_1 - 5$ mm
$Y_2 = Z_2 - 5$ mm
$X = Z_1 + N + Z_2 + 76$ mm

V = 177 mm
U = 160 mm
U = 176 mm
K = 165 mm

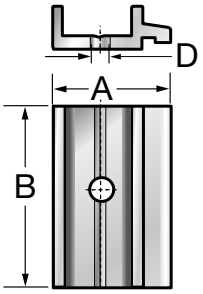
N = 62 mm
M = 22 mm

$l_1 = Z_1 - 5$ mm
l_2 = 85 mm
$l_3 = Z_2 - 5$ mm

F = 26.5 mm
h = 31.5 mm
G = 35 mm

* *See page 304 for further details of channel clearance (SP)*

Clamping piece type KL 50



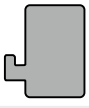
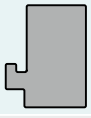
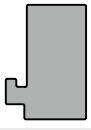
Order no.: 111210300000
A =32.4 mm
B =50.0 mm
D = 6.2 mm

For explanation see Sample order

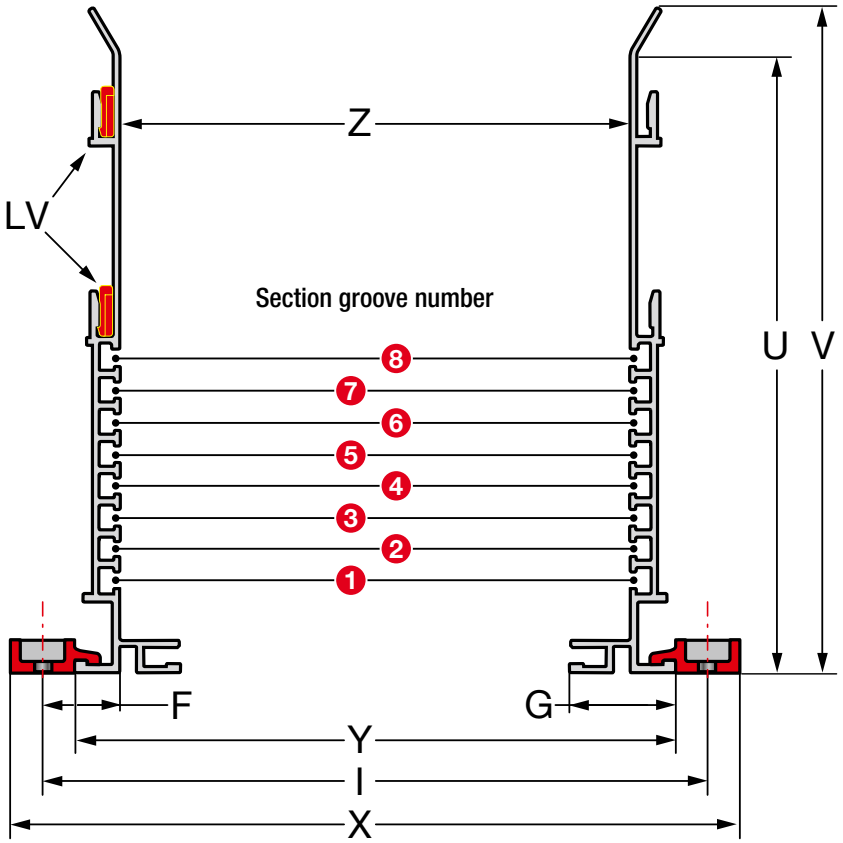
Chain type	Dampening sections: without	Dampening sections: Height 4 mm	Dampening sections: Height 9 mm	Glide rail sections: GSP 20/15	Glide rail sections: GSP 20/20	Glide rail sections: GSP 20/24	Glide rail sections: GSP 20/29	Glide rail sections: GSP 20/34	Glide rail sections: GSP 20/38	Section groove number
MP 25 MP 25 G MP 3000	●			●						1
		◐			◐					1
			○	○						2
MP 30	●				●					1
		◐		◐						2
			○		○					2
MP 32 MP 32.2 MP 32.3	●				●					2
		◐		◐						3
			○	○						3
MP 35 MP 36 G	●			●						2
		◐			◐					2
			○	○						3
MP 41.x MP 43 G MP 44	●			●						3
		◐			◐					3
			○					○		2
MP 52.x	●					●				3
		◐					◐			3
			○		○					4
MP 62.x	●				●					4
		◐					◐			4
			○					○		4
MP 65 G MP 66	●			●						4
		◐			◐					4

Example: A cable drag chain is to be installed in a VAW 177 unit. Which glide rail needs to be installed in which section groove?

The glide rail for supporting the upper run must (after exceeding the self-supporting length) be installed in the guide channel at the right height. First, locate your application's chain type in the adjacent table (column 1). To determine the matching section groove number, you next need to decide whether or not you are planning to use a (noise) dampening section. The next three columns in the table are used for this purpose. If you then look further to the right in the table, you will find the associated glide rail section and matching section groove number for installing the glide rails.

Glide rail section	GSP 20/15	GSP 20/20	GSP 20/24	GSP 20/29	GSP 20/34	GSP 20/38
						
Order no.	111010280000	111010100000	111010140000	111010120000	111010300000	111010320000

Variable guide channel system, type VAW 248, outside clamping



Outside clamping:
The channel side sections are secured to the mounting surface outside using two type KL 50 clamping pieces.

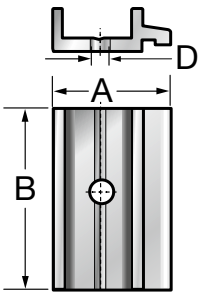
AB = Chain outside width	
SP = Channel clearance*	
Z = AB + SP*	
Y = AB + SP + 30 mm	
X = AB + SP + 76 mm	
V = 248 mm	
U = 229 mm	
I = Z + 2*F = Z + 53 mm	
F = 26.5 mm	
G = 35 mm	

* *See page 304 for further details of channel clearance (SP)*

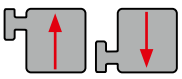
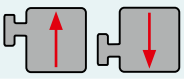
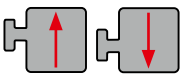
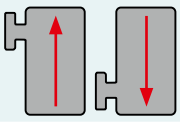
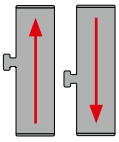
	Guide channel side section	
Type	VAW 248	VAW 248
Length	2000 mm	5000 mm
Order no.	111480100700	111480120700

	Longitudinal connectors	Dampening sections	
Type	LV	4 mm	9 mm
			
Order no.	111210100000	111012100001	111012100002

Clamping piece type KL 50

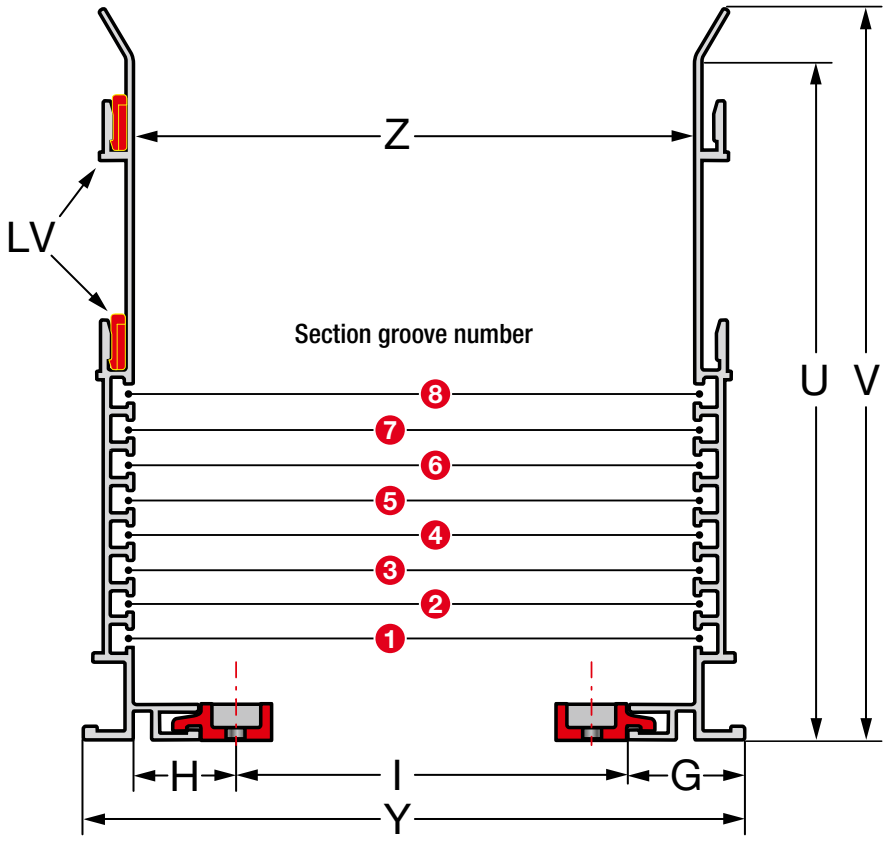


Order no.: 111210300000
A =32.4 mm
B =50.0 mm
D = 6.2 mm

Glide rail section	GSP 5/15	GSP 7/13	GSP 9/11	GSP 33/9	GSP 30/39
					
Order no.	111010180000	111010200000	111010220000	111010240000	111010340000

Note: A cable drag chain is to be installed in a VAW 248 unit. Which glide rail needs to be installed in which section groove?
See assignment table on page 329.

Variable guide channel system, type VAW 248, two-part inside clamping



Two-part inside clamping:
The channel side sections are secured to the mounting surface inside using two type KL 50 clamping pieces.

Z = AB + SP*
Z_{Min} = 87 mm**
Y = AB + SP + 30 mm
I = Z - 2*H = Z - 63 mm
V = 248 mm
U = 229 mm
H = 31.5 mm
G = 35 mm

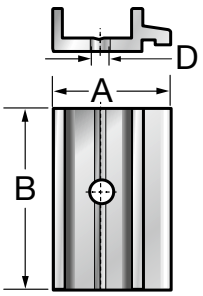
* *See page 304 for further details of channel clearance (SP)*

** *Smallest channel inside width for two-part inside clamping. Smaller inside widths are possible only with outside clamping.*

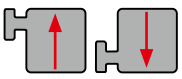
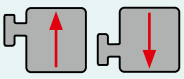
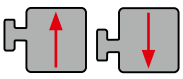
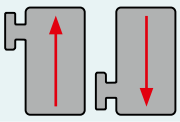
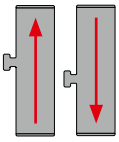
	Guide channel side section	
Type	VAW 248	VAW 248
Length	2000 mm	5000 mm
Order no.	111480100700	111480120700

	Longitudinal connectors	Dampening sections	
Type	LV	4 mm	9 mm
			
Order no.	111210100000	111012100001	111012100002

Clamping piece type KL 50

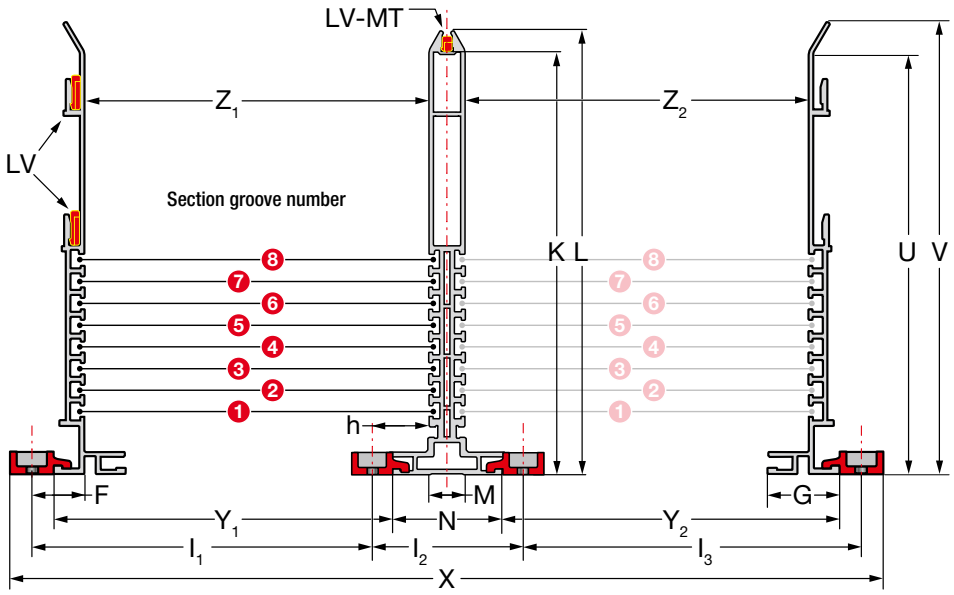


Order no.: 111210300000
A =32.4 mm
B =50.0 mm
D = 6.2 mm

Glide rail section	GSP 5/15	GSP 7/13	GSP 9/11	GSP 33/9	GSP 30/39
					
Order no.	111010180000	111010200000	111010220000	111010240000	111010340000

Note: A cable drag chain is to be installed in a VAW 248 unit. Which glide rail needs to be installed in which section groove?
See assignment table on page 329.

Variable guide channel system, type VAW 248, with centre piece



Outside clamping:
The channel side sections are secured to the mounting surface outside using two type KL 50 clamping pieces.

AB = Chain outside width
SP = Channel clearance*

Z_1 = AB + SP*
Z_2 = AB + SP*
$Y_1 = Z_1$ - 5 mm
$Y_2 = Z_2$ - 5 mm
$X = Z_1 + N + Z_2 + 76$ mm

V = 248 mm
U = 229 mm
L = 246 mm
K = 235 mm

N = 62 mm
M = 22 mm

$I_1 = Z_1$ - 5 mm
I_2 = 85 mm
$I_3 = Z_2$ - 5 mm

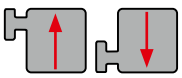
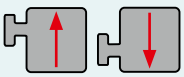
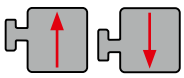
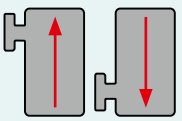
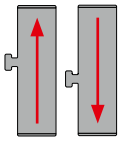
F = 26.5 mm
h = 31.5 mm
G = 35 mm

* *See page 304 for further details of channel clearance (SP)*

	Guide channel side section		Guide channel centre piece	
Type	VAW 248	VAW 248	VAW MT 248	VAW MT 248
Length	2000 mm	5000 mm	2000 mm	5000 mm
Order no.	111480100700	111480120700	111480140700	111480160700

	Longitudinal connectors		Dampening sections	
Type	LV	LV-MT	4 mm	9 mm
				
Order no.	111210100000	111210120000	111012100001	111012100002

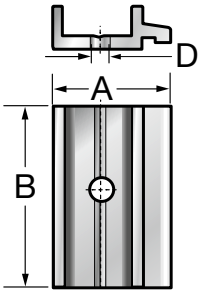
Glide rail sections, mounting direction and order no.

GSP 5/15	GSP 7/13	GSP 9/11	GSP 33/9	GSP 30/39
				
111010180000	111010200000	111010220000	111010240000	111010340000

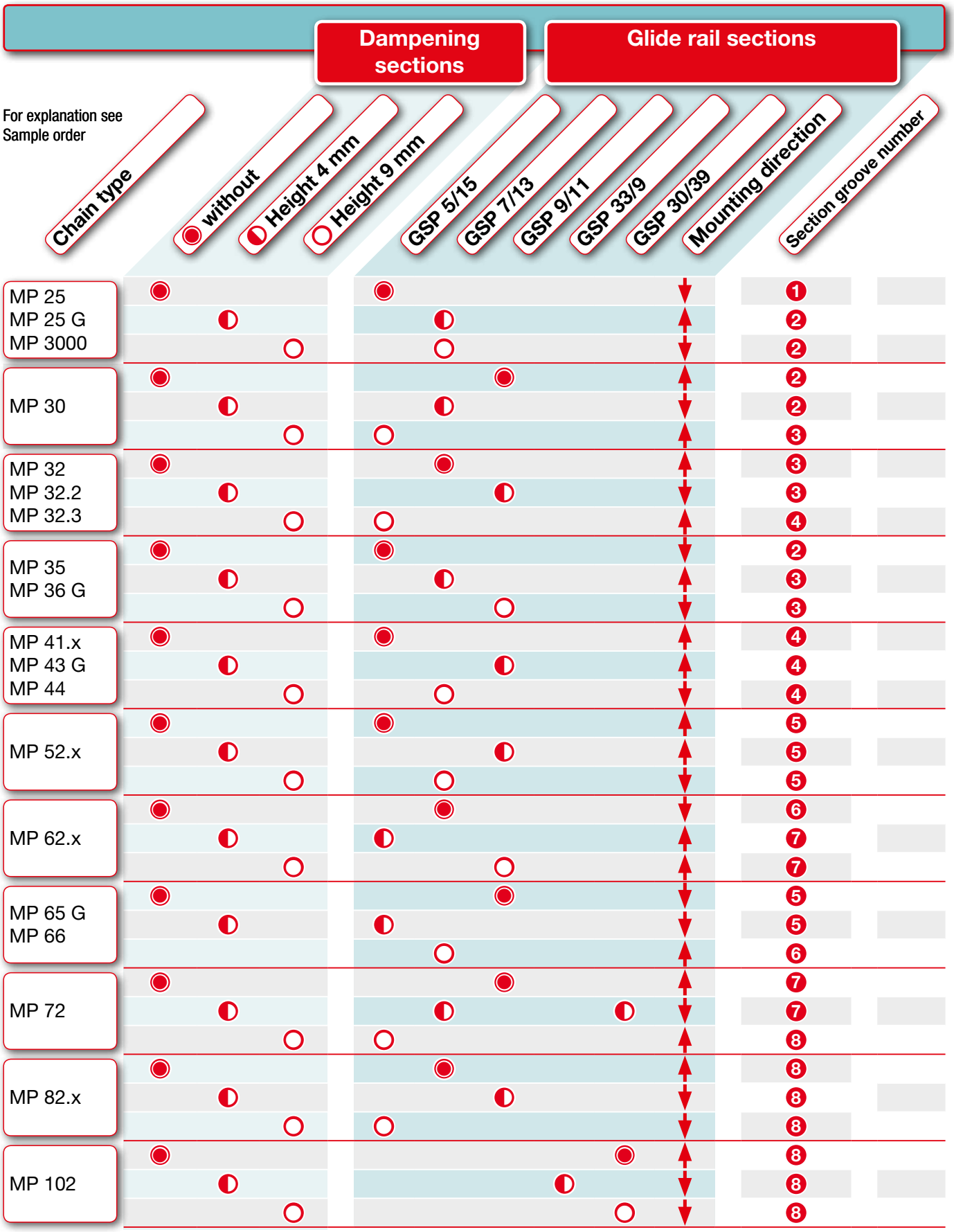
Example: A cable drag chain is to be installed in a VAW 248 unit. Which glide rail needs to be installed in which section groove?

The glide rail for supporting the upper run must (after exceeding the self-supporting length) be installed in the guide channel at the right height. First, locate your application's chain type in the adjacent table (column 1). To determine the matching section groove number, you next need to decide whether or not you are planning to use a (noise) dampening section. The next three columns in the table are used for this purpose. If you then look further to the right in the table, you will find the associated glide rail section, the mounting direction and matching section groove number for installing the glide rails.

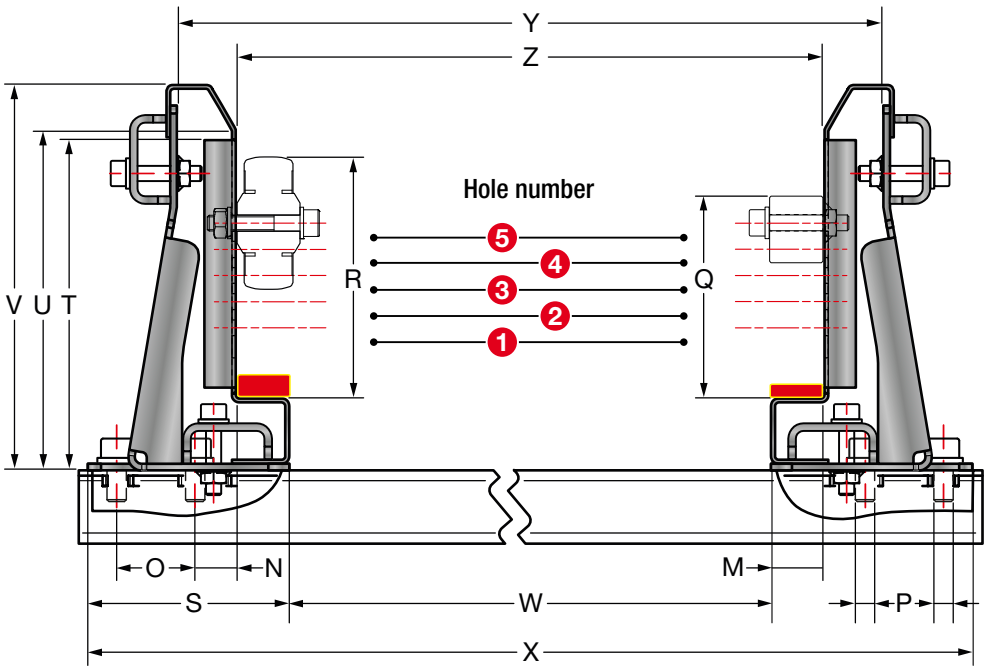
Clamping piece type KL 50



Order no.: 111210300000
A =32.4 mm
B =50.0 mm
D = 6.2 mm


Dampening sections
Glide rail sections
For explanation see Sample order
Chain type
without
Height 4 mm
Height 9 mm
GSP 5/15
GSP 7/13
GSP 9/11
GSP 33/9
GSP 30/39
Mounting direction
Section groove number
MP 25
MP 25 G
MP 3000
MP 30
MP 32
MP 32.2
MP 32.3
MP 35
MP 36 G
MP 41.x
MP 43 G
MP 44
MP 52.x
MP 62.x
MP 65 G
MP 66
MP 72
MP 82.x
MP 102

Variable guide channel system, type VAW-E 120/VAW-Z 120



AB = Chain outside width
SP = Channel clearance*

Z = AB + SP
Y = AB + SP + 45 mm
X = AB + SP + 154 mm
W = AB + SP – 41 mm

V = 147.5 mm
U = 131.3 mm
T = 126.3 mm
S = 77 mm

R = See table p. 331
Q = See table p. 331

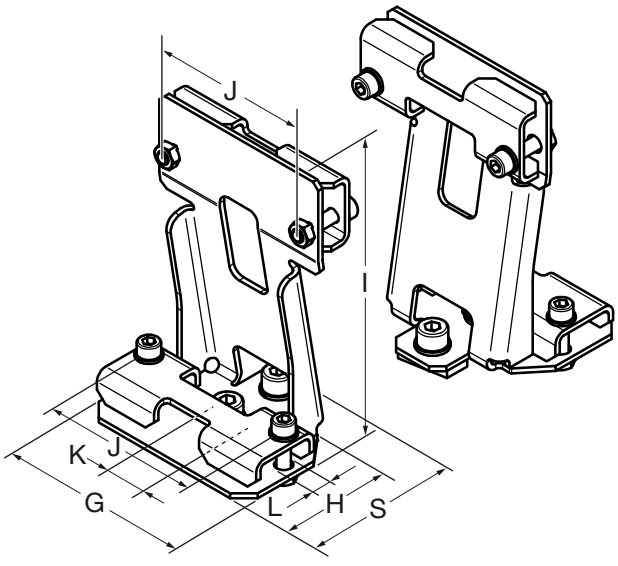
P = 9 mm Ø
O = 29 mm

N = 16.0 mm
M = 20.5 mm

** See page 304 for further details of channel clearance (SP)*

	Stainless steel guide channel, side section	Steel guide channel, side section
Type	VAW-E 120	VAW-Z 120
Length	2000 mm	2000 mm
Order no.	111510100700	111510100710
Material	Stainless steel V2A	Galvanised steel
	If saltwater resistance is required, V4A stainless steel is available on request.	

Channel bracket set WHE-120	Channel bracket set WHZ-120
Order no.: 80124088	Order no.: 80124089
Material: Stainless steel V2A	Material: Galvanised steel
G = 92 mm	G = 92 mm
H = 55 mm	H = 55 mm
I = 139.5 mm	I = 139.5 mm
J = 78 mm	J = 78 mm
K = 20 mm	K = 20 mm
L = 9 mm	L = 9 mm
S = 77 mm	S = 77 mm



Accessories for type VAW-E 120 and VAW-Z 120

Rubber dampeners for lowering the noise level, for installation on the running surfaces of variable guide channels.
Glide rails and ball-bearing mounted rollers in a range of designs as a surface for the upper run of the cable drag chain.
See Accessories, page 333.

Type VAW-E 120/VAW-Z 120

For explanation see Sample order

Chain type	Rubber dampener: none	Rubber dampener: Height 4 mm	Rubber dampener: Height 9 mm	Roller wheel: Roller wheel Ø 50 mm	Roller wheel: Dimension R mm	Roller wheel: GSP 10/15	Glide rail: Dimension Q mm	Glide rail: Mounting direction	Glide rail: Hole number
MP 25 MP 25 G	●				●	37.0	E above		1
		◐			◐	42.0	F above		1
			○		○	47.0	E above		2
			○	○ 52.0					1
MP 30	●				●	42.0	F above		1
		◐			◐	47.0	E above		2
			○		○	52.0	F above		2
		◐		◐ 52.0					1
			○	○ 52.0					1
MP 32 MP 32.2 MP 32.3	●				●	52.0	F above		2
		◐			◐	57.0	E above		3
			○		○	62.0	F above		3
	●			● 62.0					2
		◐		◐ 62.0					2
			○	○ 62.0					2
MP 35 MP 36 G	●				●	47.0	E above		2
		◐			◐	52.0	F above		2
			○		○	57.0	E above		3
	●			● 52.0					1
		◐		◐ 52.0					1
			○	○ 62.0					2
MP 41 MP 41.2 MP 41.3	●				●	62.0	F above		3
		◐			◐	67.0	E above		4
			○		○	72.0	F above		4
	●			● 62.0					2
		◐		◐ 72.0					3
			○	○ 72.0					3

(Continued on the next page)

Type VAW-E 120/VAW-Z 120

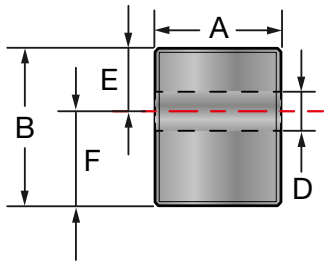
Chain type	Rubber dampener: none	Rubber dampener: Height 4 mm	Rubber dampener: Height 9 mm	Roller wheel Ø 50 mm	Roller wheel: Dimension R mm	Roller wheel: GSP 10/15	Glide rail: Dimension Q mm	Glide rail: Mounting direction	Glide rail: Hole number
MP 52.1 MP 52.2 MP 52.3	●				●	77.0	E above		5
		◐			◐	77.0	E above		5
			○		○	82.0	F above		5
	●			●	82.0				4
		◐		◐	82.0				4
			○	○	92.0				5
MP 3000		○			○	37.0	E above		1
			◐		◐	42.0	F above		1
			○	○	52.0				1

Example: An MP 32 is to be installed in a VAW-E 120 unit. What options are available?

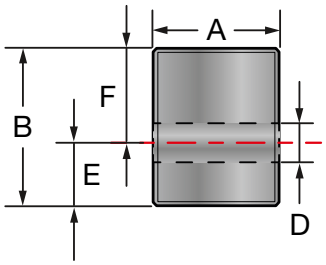
A glide rail (the appropriate type to use is GSP 10/15 with asymmetrically drilled holes) can be used here both with and without a rubber dampener. Without a rubber dampener, the glide rail is secured in hole number 2, with the larger hole spacing located above (dimension F in the drawing, F^{above} in the table). This ensures the upper edge has a clearance of 52 mm above the chain support.
If a rubber dampener is to be utilised (to achieve lower levels of running noise), then the glide rail's upper edge needs to be positioned higher. This is achieved either by turning the glide rail over and/or by securing it in a hole located higher up.

For using a roller wheel instead of a glide rail, the installation options are listed in the same way: the roller wheel is secured in hole number 2 with or without a rubber dampener, with an upper edge clearance of 62 mm from the chain support surface.

Accessories for all variable guide channels, type VAW-E 120/VAW-Z 120

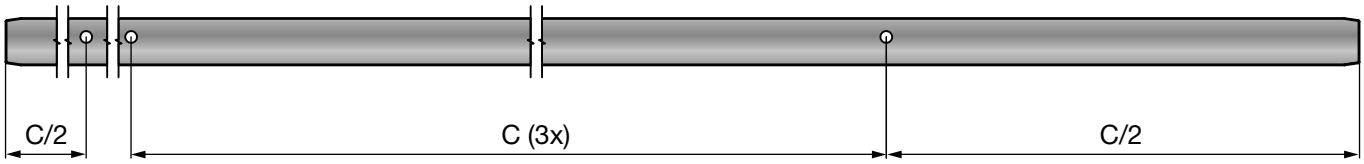


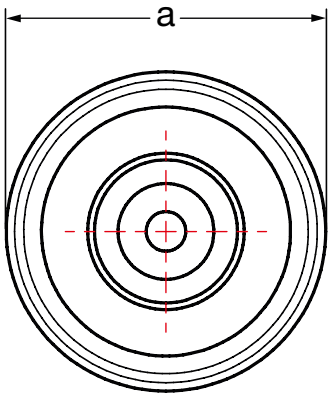
Mounting direction: E *above*

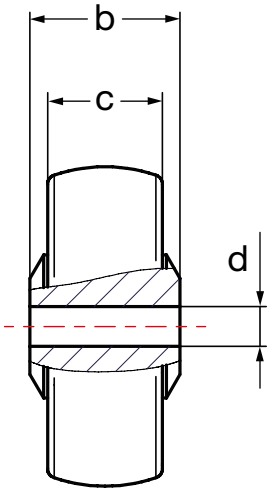


Mounting direction: F *above*

Glide rail GSP 10/15	Order no. 111010260000
Length: 2000 mm	
A = 20 mm	
B = 25.0 mm	
C = 500.0 mm	
D = 6.2 mm	
E = 10 mm	
F = 15 mm	

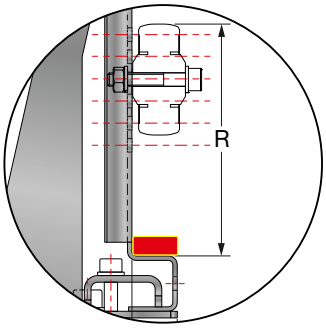


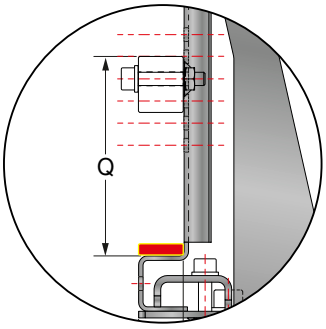




Roller wheel
for standard applications
Order no.: by request
a = 50.0 mm
b = 23.5 mm
c = 18.0 mm
d = 6.0 mm

Roller wheel
electrically conductive, for ESD applications
Order no.: by request
a = 50.0 mm
b = 23.5 mm
c = 18.0 mm
d = 6.0 mm

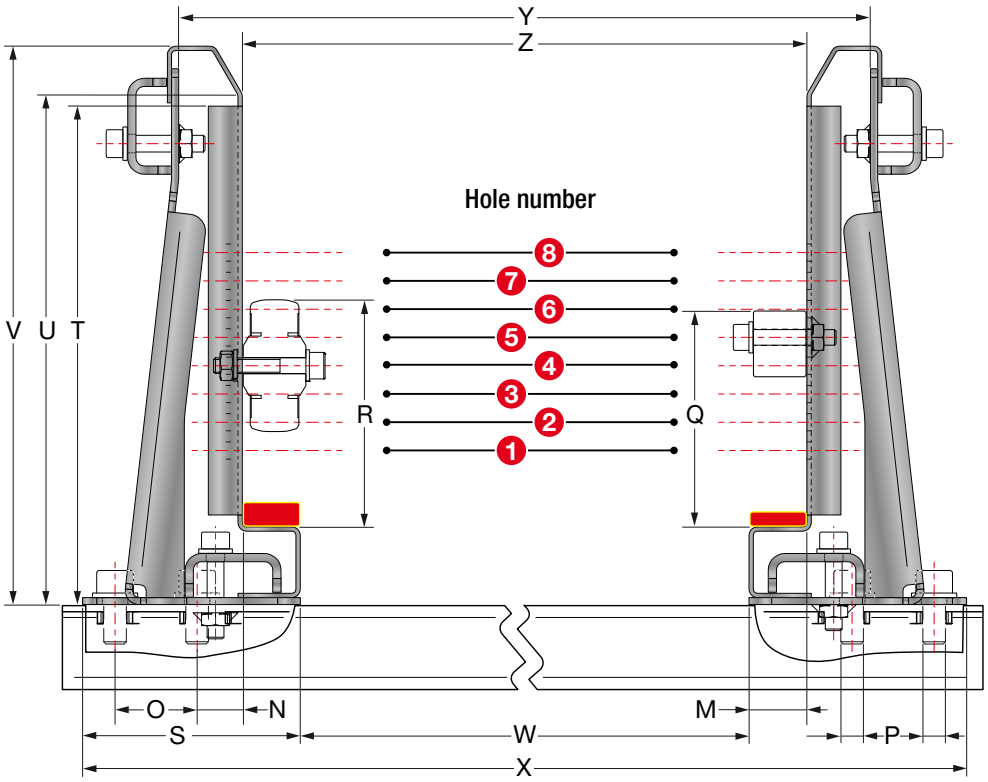




VAW rubber pyramid, self-adhesive
Roller: 10 m, width: 20 mm, height: 4 mm
Order no.: 111012100000
Material: NR/SBR

VAW 2K dampener section, self-adhesive
Length: 2000 mm, width: 20 mm, height: 9 mm
Order no.: 111012100002
Material: EPDM/TPE/acrylate

Variable guide channel system, type VAW-E 170/VAW-Z 170



AB = Chain outside width
SP = Channel clearance*

Z = AB + SP
Y = AB + SP + 45 mm
X = AB + SP + 154 mm
W = AB + SP – 41 mm

V = 197.5 mm
U = 181.3 mm
T = 176.3 mm
S = 77 mm

R = See table p. 335
Q = See table p. 335

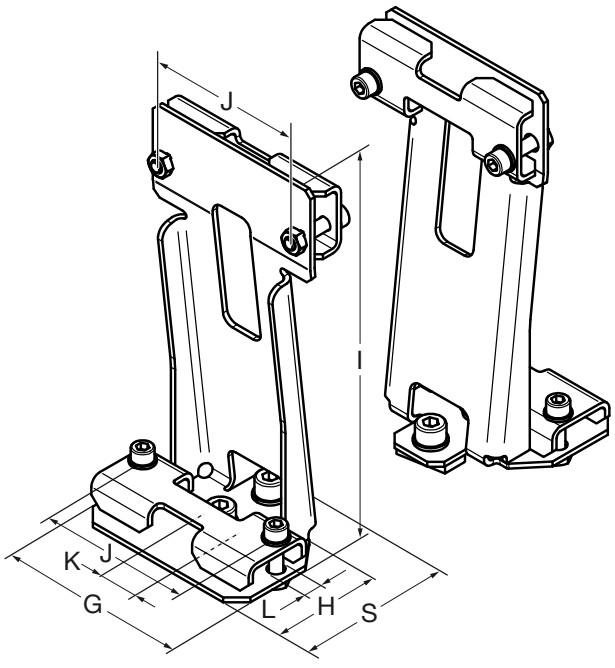
P = 9 mm Ø
O = 35.5 mm

N = 16.0 mm
M = 20.5 mm

** See page 304 for further details of channel clearance (SP)*

	Stainless steel guide channel, side section	Steel guide channel, side section
Type	VAW-E 170	VAW-Z 170
Length	2000 mm	2000 mm
Order no.	111520100700	111520100710
Material	Stainless steel V2A	Galvanised steel
	If saltwater resistance is required, V4A stainless steel is available on request.	

Channel bracket set WHE-170	Channel bracket set WHZ-170
Order no.: 80124091	Order no.: 80124092
Material: Stainless steel V2A	Material: Galvanised steel
G = 92 mm	G = 92 mm
H = 55 mm	H = 55 mm
I = 189.5 mm	I = 189.5 mm
J = 78 mm	J = 78 mm
K = 20 mm	K = 20 mm
L = 9 mm	L = 9 mm
S = 77 mm	S = 77 mm



Accessories for type VAW-E 170 and VAW-Z 170

Rubber dampeners for lowering the noise level, for installation on the running surfaces of variable guide channels.
Glide rails and ball-bearing mounted rollers in a range of designs as a surface for the upper run of the cable drag chain.
See Accessories, page 337.

Type VAW-E 170/VAW-Z 170

For explanation see Sample order

Chain type	Rubber dampener: none	Rubber dampener: Height 4 mm	Rubber dampener: Height 9 mm	Roller wheel: Roller wheel Ø 50 mm	Roller wheel: Dimension R mm	Roller wheel: GSP 10/15	Glide rail: Dimension Q mm	Glide rail: Mounting direction	Glide rail: Hole number
MP 25 MP 25 G	●				●	37.0	E above		1
		◐			◐	42.0	F above		1
			○		○	47.0	E above		2
			○	○ 52.0					1
MP 30	●				●	42.0	F above		1
		◐			◐	47.0	E above		2
			○		○	52.0	F above		2
		◐		◐ 52.0					1
			○	○ 52.0					1
MP 32 MP 32.2 MP 32.3	●				●	52.0	F above		2
		◐			◐	57.0	E above		3
			○		○	62.0	F above		3
	●			● 62.0					2
		◐		◐ 62.0					2
			○	○ 62.0					2
MP 35 MP 36 G	●				●	47.0	E above		2
		◐			◐	52.0	F above		2
			○		○	57.0	E above		3
	●			● 52.0					1
		◐		◐ 52.0					1
			○	○ 62.0					2
MP 41 MP 41.2 MP 41.3	●				●	62.0	F above		3
		◐			◐	67.0	E above		4
			○		○	72.0	F above		4
	●			● 62.0					2
		◐		◐ 72.0					3
			○	○ 72.0					3

(Continued on the next page)

Type VAW-E 170/VAW-Z 170

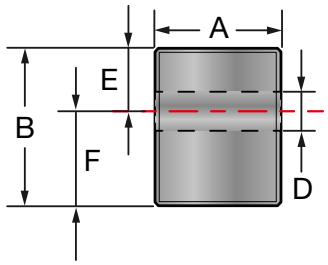
Chain type	Rubber dampener: none	Rubber dampener: Height 4 mm	Rubber dampener: Height 9 mm	Roller wheel: Roller wheel Ø 50 mm	Roller wheel: Dimension R mm	Glide rail: GSP 10/15	Glide rail: Dimension Q mm	Glide rail: Mounting direction	Glide rail: Hole number
MP 52.1 MP 52.2 MP 52.3	●				●	77.0	E above		5
		◐			◐	77.0	E above		5
			○		○	82.0	F above		5
	●			●	82.0				4
		◐		◐	82.0				4
			○	○	92.0				5
MP 62.1 MP 62.2 MP 62.3	●				●	92.0	F above		6
		◐			◐	97.0	E above		7
			○		○	102.0	F above		7
	●			●	102.0				6
		◐		◐	102.0				6
			○	○	112.0				7
MP 72	●				●	102.0	F above		7
		◐			◐	107.0	E above		8
			○		○	112.0	F above		8
	●			●	102.0				6
		◐		◐	112.0				7
			○	○	112.0				7
MP 3000	●				●	37.0	E above		1
		◐			◐	37.0	E above		1
			○		○	42.0	F above		1
			○	○	52.0				1

Example: An MP 32 is to be installed in a VAW-E 170 unit. What options are available?

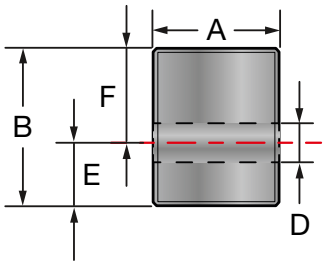
A glide rail (the appropriate type to use is GSP 10/15 with asymmetrically drilled holes) can be used here both with and without a rubber dampener. Without a rubber dampener, the glide rail is secured in hole number 2, with the larger hole spacing located above (dimension F in the drawing, F above in the table). This ensures the upper edge has a clearance of 52 mm above the chain support.
If a rubber dampener is to be utilised (to achieve lower levels of running noise), then the glide rail's upper edge needs to be positioned higher. This is achieved either by turning the glide rail over and/or by securing it in a hole located higher up.

For using a roller wheel instead of a glide rail, the installation options are listed in the same way: the roller wheel is secured in hole number 2 with or without a rubber dampener, with an upper edge clearance of 62 mm from the chain support surface.

Accessories for all variable guide channels, type VAW-E 170/VAW-Z 170

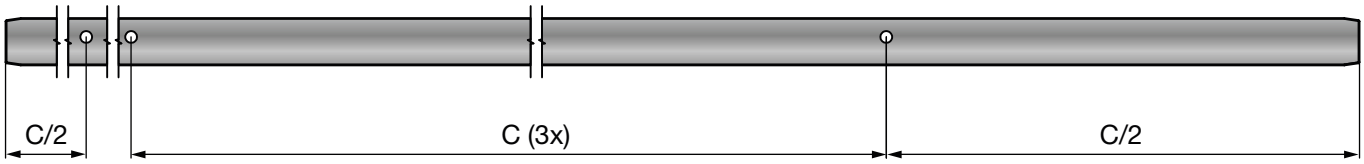


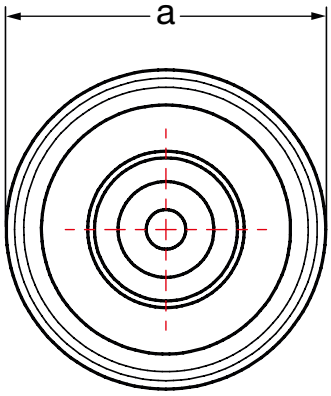
Mounting direction: E *above*

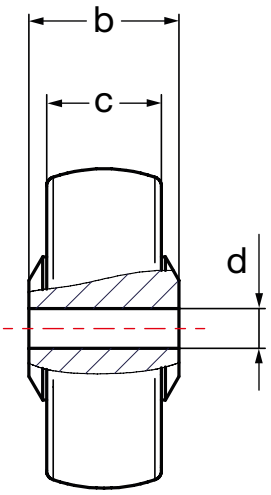


Mounting direction: F *above*

Glide rail GSP 10/15	Order no. 111010260000
Length: 2000 mm	
A = 20 mm	
B = 25.0 mm	
C = 500.0 mm	
D = 6.2 mm	
E = 10 mm	
F = 15 mm	

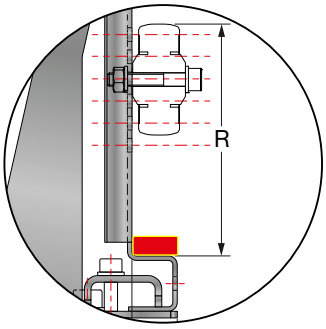


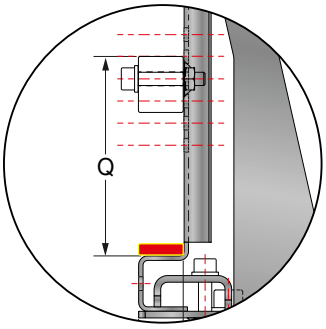




Roller wheel
for standard applications
Order no.: by request
a = 50.0 mm
b = 23.5 mm
c = 18.0 mm
d = 6.0 mm

Roller wheel
electrically conductive, for ESD applications
Order no.: by request
a = 50.0 mm
b = 23.5 mm
c = 18.0 mm
d = 6.0 mm

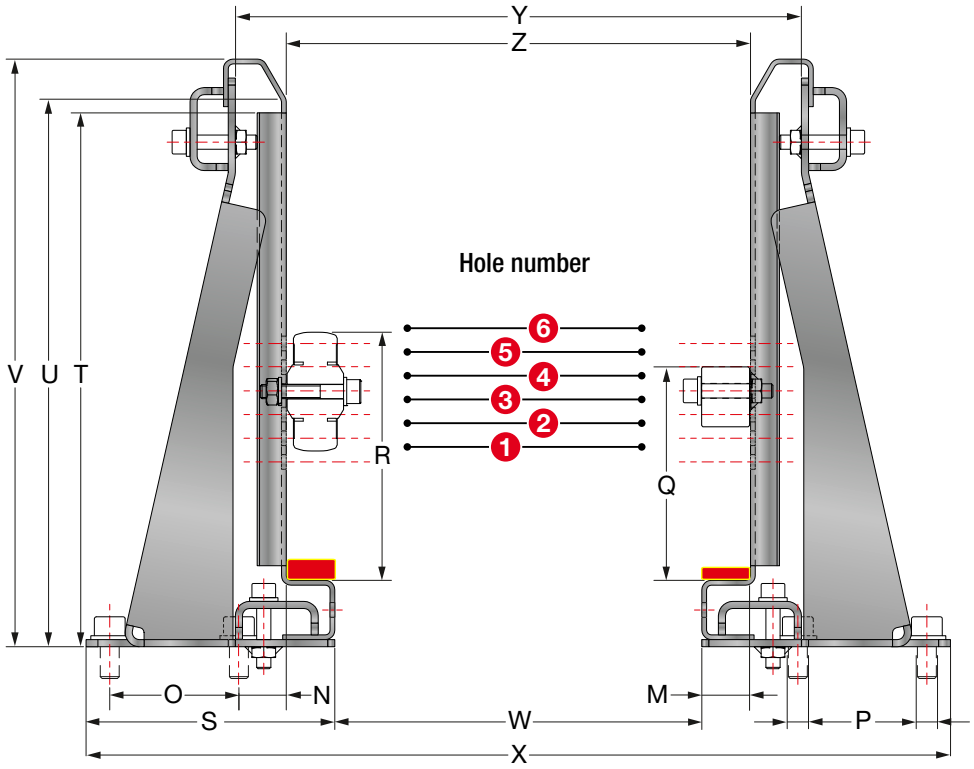




VAW rubber pyramid, self-adhesive
Roller: 10 m, width: 20 mm, height: 4 mm
Order no.: 111012100000
Material: NR/SBR

VAW 2K dampener section, self-adhesive
Length: 2000 mm, width: 20 mm, height: 9 mm
Order no.: 111012100002
Material: EPDM/TPE/acrylate

Variable guide channel system, type VAW-E 220/VAW-Z 220



AB = Chain outside width
SP = Channel clearance*

Z = AB + SP
Y = AB + SP + 85 mm
X = AB + SP + 169 mm
W = AB + SP – 41 mm

V = 248 mm
U = 231 mm
T = 220 mm
S = 105 mm

R = See table p. 339
Q = See table p. 339

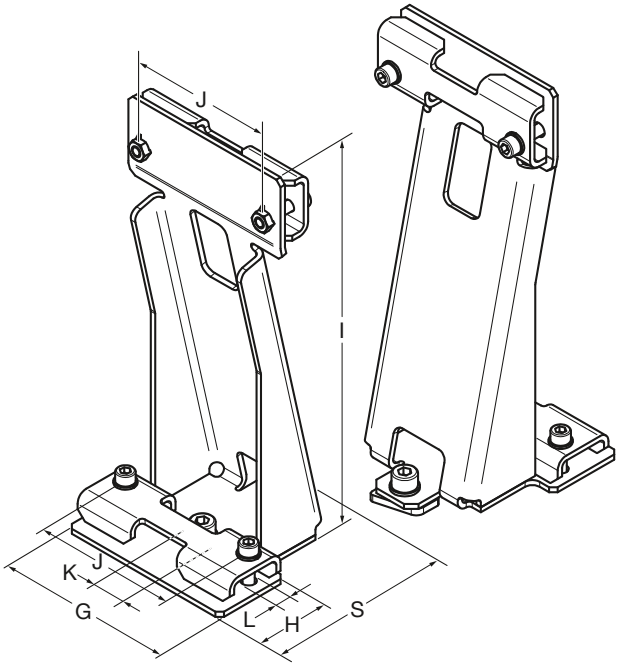
P = 9 mm Ø
O = 55 mm

N = 20 mm
M = 20.5 mm

** See page 304 for further details of channel clearance (SP)*

	Stainless steel guide channel, side section	Steel guide channel, side section
Type	VAW-E 220	VAW-Z 220
Length	2000 mm	2000 mm
Order no.	111500100700	111500100710
Material	Stainless steel V2A	Galvanised steel
	If saltwater resistance is required, V4A stainless steel is available on request.	

Channel bracket set WHE-220	Channel bracket set WHZ-220
Order no.: 80124094	Order no.: 80124095
Material: Stainless steel V2A	Material: Galvanised steel
G = 105 mm	G = 105 mm
H = 45 mm	H = 45 mm
I = 240 mm	I = 240 mm
J = 85 mm	J = 85 mm
K = 20 mm	K = 20 mm
L = 9 mm	L = 9 mm
S = 105 mm	S = 105 mm



Accessories for type VAW-E 220 and VAW-Z 220

Rubber dampeners for lowering the noise level, for installation on the running surfaces of variable guide channels.
Glide rails and ball-bearing mounted rollers in a range of designs as a surface for the upper run of the cable drag chain.
See Accessories, page 341.

Type VAW-E 220/VAW-Z 220

For explanation see Sample order

Chain type	Rubber dampener: none	Rubber dampener: Height 4 mm	Rubber dampener: Height 9 mm	Roller wheel: Roller wheel Ø 50 mm	Roller wheel: Dimension R mm	Roller wheel: GSP 10/15	Glide rail: Dimension Q mm	Glide rail: Mounting direction	Glide rail: Hole number
MP 25 MP 25 G	●				●	37.0	E above		1
		◐			◐	42.0	F above		1
			○		○	47.0	E above		2
			○	○ 52.0					1
MP 30	●				●	42.0	F above		1
		◐			◐	47.0	E above		2
			○		○	52.0	F above		2
		◐		◐ 52.0					1
			○	○ 52.0					1
MP 32 MP 32.2 MP 32.3	●				●	52.0	F above		2
		◐			◐	57.0	E above		3
			○		○	62.0	F above		3
	●			● 62.0					2
		◐		◐ 62.0					2
			○	○ 62.0					2
MP 35 MP 36 G	●				●	47.0	E above		2
		◐			◐	52.0	F above		2
			○		○	57.0	E above		3
	●			● 52.0					1
		◐		◐ 52.0					1
			○	○ 62.0					2
MP 41 MP 41.2 MP 41.3	●				●	62.0	F above		3
		◐			◐	67.0	E above		4
			○		○	72.0	F above		4
	●			● 62.0					2
		◐		◐ 72.0					3
			○	○ 72.0					3

(Continued on the next page)

Type VAW-E 220/VAW-Z 220

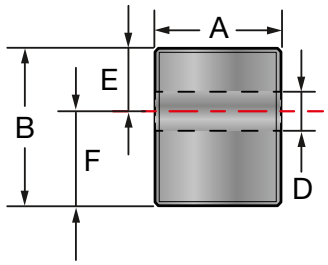
Chain type	Rubber dampener: none	Rubber dampener: Height 4 mm	Rubber dampener: Height 9 mm	Roller wheel: Roller wheel Ø 50 mm	Roller wheel: Dimension R mm	Glide rail: GSP 10/15	Glide rail: Dimension Q mm	Glide rail: Mounting direction	Glide rail: Hole number
MP 52.1 MP 52.2 MP 52.3	●				●	77.0	E above		5
		◐			◐	77.0	E above		5
			○		○	82.0	F above		5
	●			●	82.0				4
		◐		◐	82.0				4
			○	○	92.0				5
MP 62.1 MP 62.2 MP 62.3	●				●	92.0	F above		6
		◐			◐	97.0	E above		7
			○		○	102.0	F above		7
	●			●	102.0				6
		◐		◐	102.0				6
			○	○	112.0				7
MP 72	●				●	102.0	F above		7
		◐			◐	107.0	E above		8
			○		○	112.0	F above		8
	●			●	102.0				6
		◐		◐	112.0				7
			○	○	112.0				7
MP 3000	●				●	37.0	E above		1
		◐			◐	37.0	E above		1
			○		○	42.0	F above		1
			○	○	52.0				1

Example: An MP 32 is to be installed in a VAW-E 220 unit. What options are available?

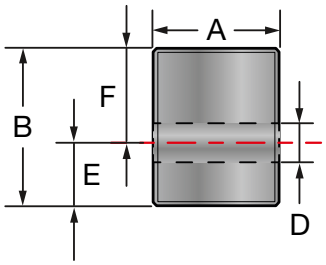
A glide rail (the appropriate type to use is GSP 10/15 with asymmetrically drilled holes) can be used here both with and without a rubber dampener. Without a rubber dampener, the glide rail is secured in hole number 2, with the larger hole spacing located above (dimension F in the drawing, F^{above} in the table). This ensures the upper edge has a clearance of 52 mm above the chain support.
If a rubber dampener is to be utilised (to achieve lower levels of running noise), then the glide rail's upper edge needs to be positioned higher. This is achieved either by turning the glide rail over and/or by securing it in a hole located higher up.

For using a roller wheel instead of a glide rail, the installation options are listed in the same way: the roller wheel is secured in hole number 2 with or without a rubber dampener, with an upper edge clearance of 62 mm from the chain support surface.

Accessories for all variable guide channels, type VAW-E 220/VAW-Z 220

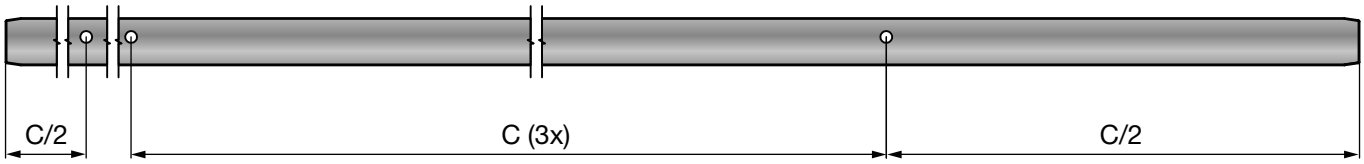


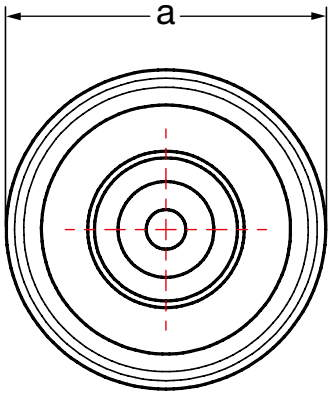
Mounting direction: E *above*

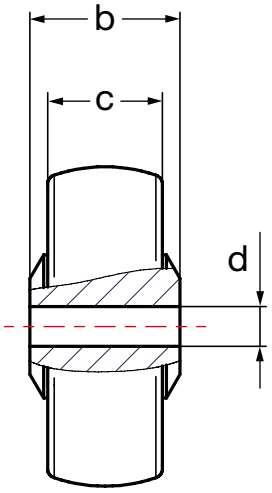


Mounting direction: F *above*

Glide rail GSP 10/15	Order no. 111010260000
Length: 2000 mm	
A = 20 mm	
B = 25.0 mm	
C = 500.0 mm	
D = 6.2 mm	
E = 10 mm	
F = 15 mm	

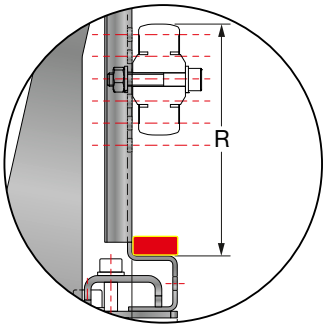


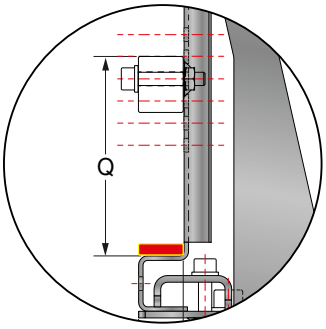




Roller wheel
for standard applications
Order no.: by request
a = 50.0 mm
b = 23.5 mm
c = 18.0 mm
d = 6.0 mm

Roller wheel
electrically conductive, for ESD applications
Order no.: by request
a = 50.0 mm
b = 23.5 mm
c = 18.0 mm
d = 6.0 mm





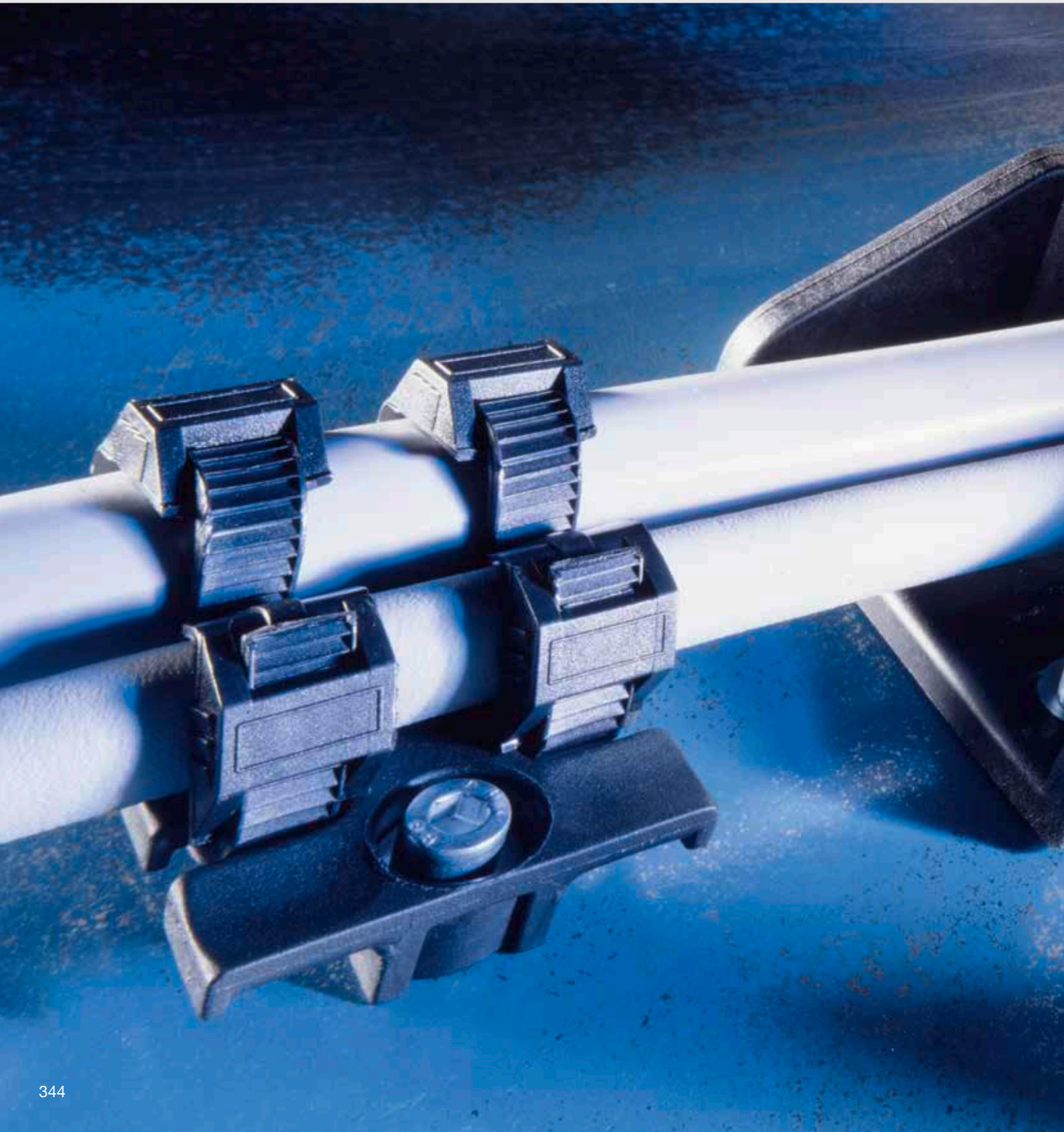
VAW rubber pyramid, self-adhesive
Roller: 10 m, width: 20 mm, height: 4 mm
Order no.: 111012100000
Material: NR/SBR

VAW 2K dampener section, self-adhesive
Length: 2000 mm, width: 20 mm, height: 9 mm
Order no.: 111012100002
Material: EPDM/TPE/acrylate


EFK

Strain relief systems

Introduction



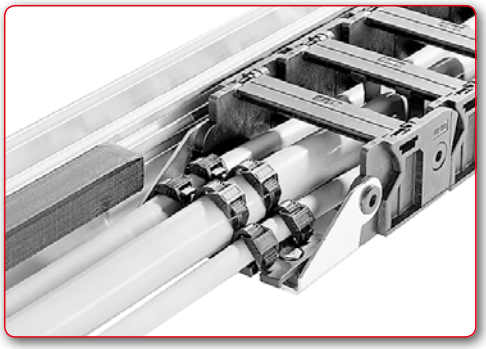
For every system:
the right strain relief
Cables and conduits that are to be routed in a cable drag chain should always be secured using a strain relief mechanism.
The right strain relief mechanism has a positive effect on the durability of the cables and conduits.

ZL (strain relief plate)
This strain relief mechanism offers a safe and cost-effective system using cable ties. The insertable bushing (ELB) stops the cold extrusion characteristic of plastic from affecting the secure fixing of the plate. Use of a stand-off (DH) offers a two-tier construction option.

RS-ZL (frame bridge strain relief plate)
The frame bridge strain relief plate is snapped-in to the cable drag chain's chain brackets. Two RS-ZL units can be mounted on each of the two chain ends (on the inside and the outside bend). The cables are secured using cable ties.

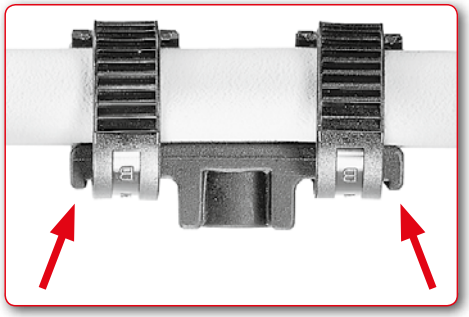
Steel Fix bow clamp
A c-profile (slot width 11 mm), integrated into the chain bracket, serves to secure the Steel Fix bow clamps.

The bow clamps can be used for strain relief of one, two or three cables arranged on top of each other. In the standard design, the housing body is protected against corrosion by cathodic dip painting. A stainless steel model is also available.



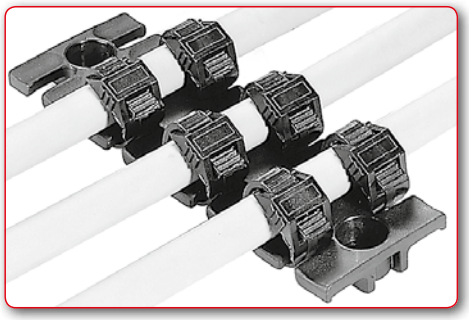
Strain relief plate (ZL) mounted in a cable drag chain's chain bracket.

Advantages



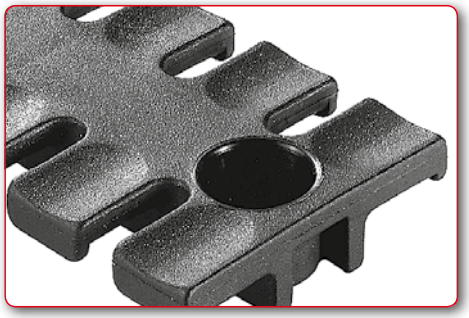
Secure hold

The undercut on the underside of the plate prevents the cable tie from slipping off – even with very large cable diameters.



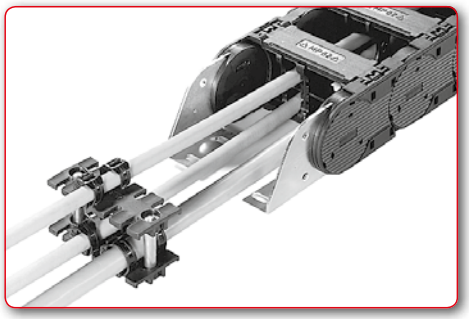
Longer life

Each cable is secured by 2 power cable ties on each end. This spreads the pressure on the cable and thereby minimises the risk of damage to the cable core.



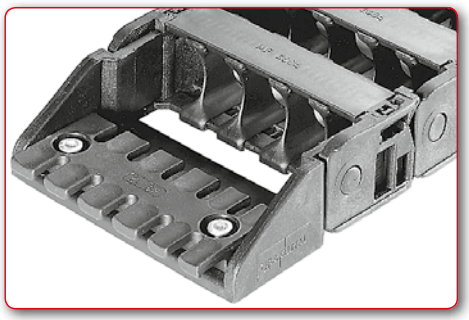
Wide support face on the individual plate tongues

The cables are optimally secured by the wide supporting surfaces of the individual strain relief tongues. The wide power cable ties help to facilitate strain relief which is quick and simple but gentle on the cables.



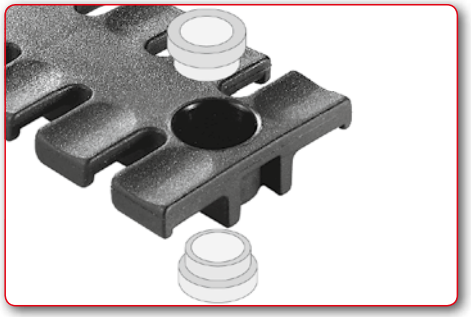
Two-tier assembly

2-tier installation is possible by using the DH stand-offs.



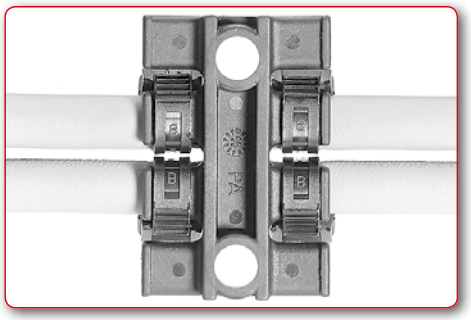
Compatible fixing holes

The dimensions of the holes on the plates system match those on the chain brackets.
Please note the dimension of the holes on the strain relief plate when using strain relief in the chain bracket (see page 350/351).



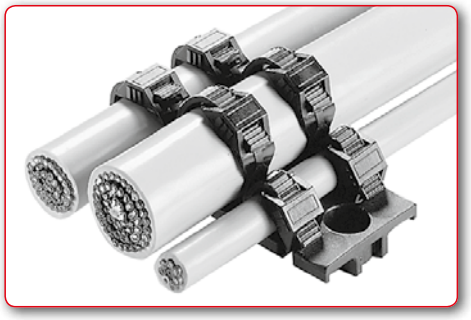
Durable fastening with metal bush

The metal bushes inhibit cold flow properties. Metal is screwed onto metal. The screws are prevented from working loose. (Please order separately.)



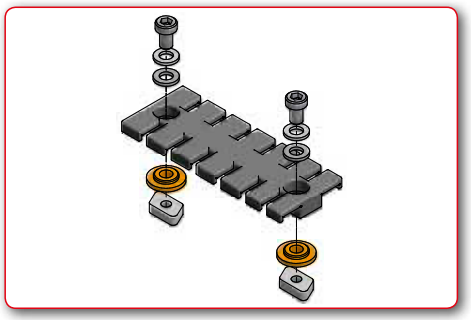
Easy assembly

Even if two cables are immediately next to each other, it is possible to secure them with two power cable ties.



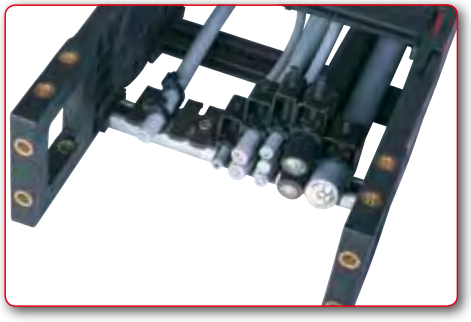
Different cable diameters

The flexible use of power cable ties provides strain relief which is quick and simple but very gentle on the cables, even for cables of very different diameters with extremely high packing density.



Single or as a complete set

Our strain relief plates are available singly or in a set, e. g. for mounting on a C-rail:
A strain relief plate, complete with cylinder head bolt, plain and serrated washer, insert bushings and T-slot nut.



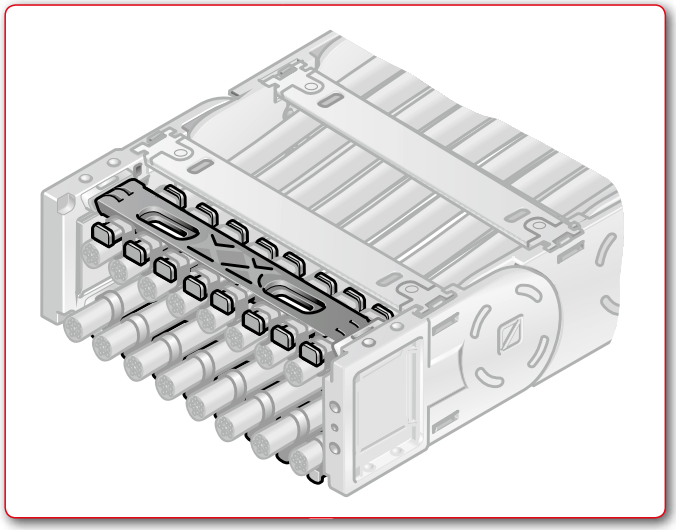
Steel Fix bow clamps

- for C-rails with a groove width of 11 mm
- for one, two or three cables on top of each other
- Corrosion protection via cathodic dip painting (CDP)
- trough elements with low-wear cable design
- stainless steel design available on request

Selection criteria / engineering notes

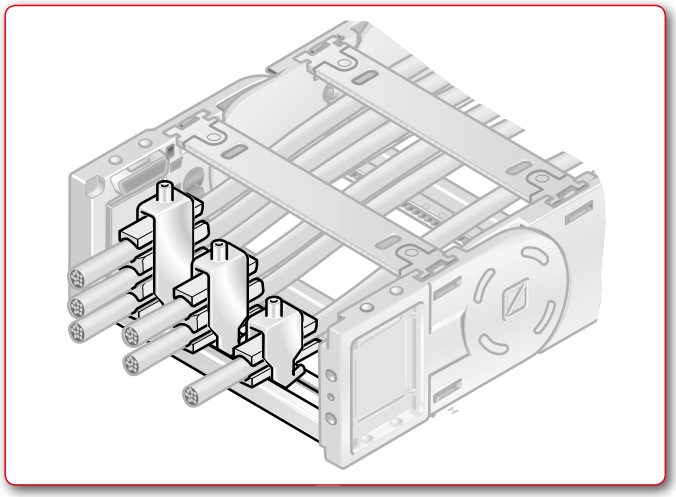
Where is the strain relief situated?

For cable drag chains with standard inside widths of up to 243 mm, frame bridge strain relief plates (RS-ZL) are the ideal solution for relieving power cabling and media conduits from strain in a space-saving, secure way. They are supplied in the same widths as the frame bridges for the respective chain type.



They are secured in much the same way as the frame bridges themselves, by snapping them into pre-cut recesses in the chain brackets. This enables two strain relief plates to be integrated into the cable drag chain per cable end, both for the inside bend and the outside bend.

As an alternative, the same recesses that accept a frame bridge strain relief plate can also be used for the fixed integration of a C-section rail. This enables the provision of rapid and reliable strain relief even for individual chain inside widths that differ from the grid spacings.

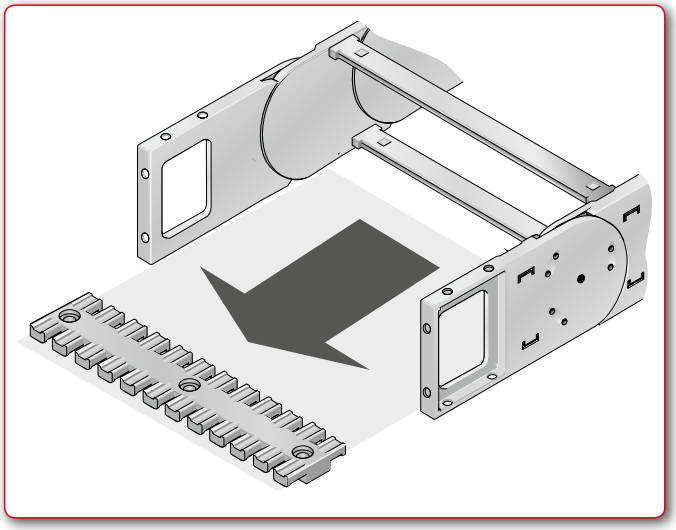


We offer two separate strain relief systems for this specific application:
The first is to use our Steel Fix bow clamps, which accept up to three power cables on top of one another per fixing element. The second option is ZL-format strain relief plates, which match frame bridge strain relief plates in form and function.

The options described above assume that the distance from the last movable point of the cable drag chain to the strain relief mechanism is sufficient for all of the installed power cabling/media conduits (depends on the minimum bending radius).

If this is not the case, then you will need to use one of the options as described below:

1. Reposition strain relief in front of chain

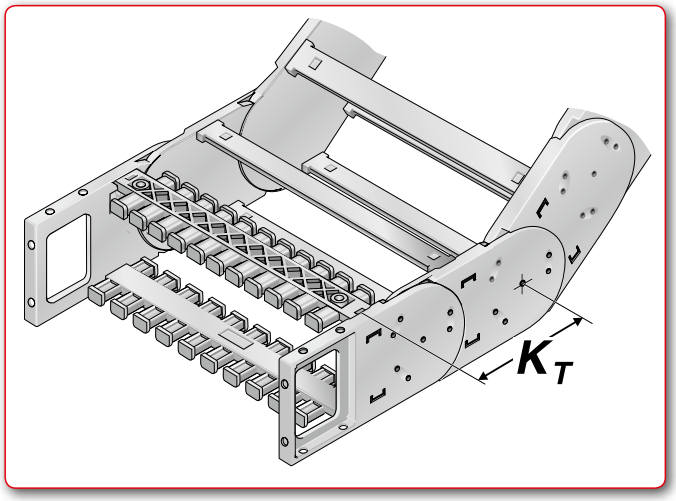


To increase the distance from the strain relief to the first movable point, the strain relief can be moved to a position outside the chain bracket. To do so, you can utilise our Steel Fix bow clamps and ZL-C strain relief plates, which are mounted on C-section rails. The ZL strain relief plates can also be secured to a load-bearing substrate directly, without using C-section rails.

A further positive effect of this option is that the chain bracket itself remains free of additional pulling forces.

Design / structure

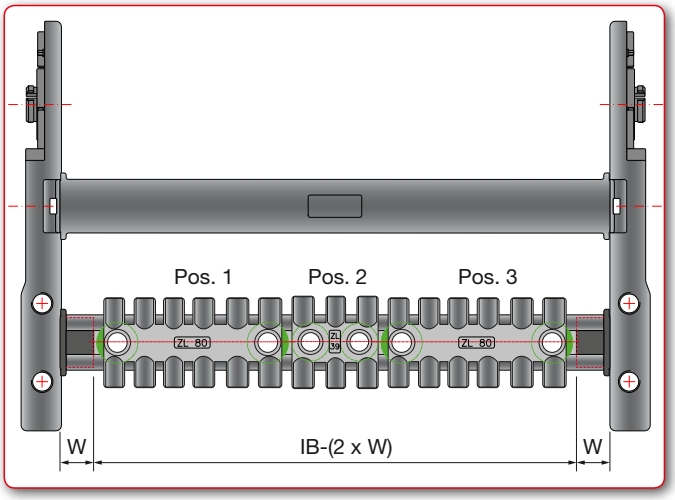
2. Lengthening the chain



If the installation space available permits and the circular arc distance may be increased still further, then the installation of additional chain links can also be used to achieve the necessary distance between the strain relief and the first movable point of the chain.

Note on installation width when using a permanently installed C-section rail.

To secure a C-section rail within the chain bracket (order no.: 81661610), one fixing clip is inserted into the C-section rail on both sides. This slightly reduces the installation space available for strain relief plates or for bow clamps. The space required for the mounting clip depends on the chain type deployed and is in the range 4–15 mm. Please contact our layout experts.



Solutions for inside widths over 243 mm

For our HeavyLine and PowerLine chains, the RS-ZL strain relief plate offers standard solutions up to an inside width of 243 mm. For larger inside widths, multiple strain relief plates are combined together and mounted on a C-section rail (order no.: 81661610).

We recommend the following solutions:

Inside width in mm			Recommended ZL combinations			
Nominal	-2 x W	Effective	Item 1	Item 2	Item 3	Item 4
246	30	216	ZL 87	ZL 39	ZL 87	– –
268	30	238	ZL 62	ZL 87	ZL 87	– –
293	30	263	ZL 87	ZL 87	ZL 87	– –
296	30	266	ZL 87	ZL 178	– –	– –
318	30	288	ZL 62	ZL 86	ZL 140	– –
343	30	313	ZL 87	ZL 103	ZL 121	– –
346	30	316	ZL 87	ZL 87	ZL 140	– –
396	30	366	ZL 121	ZL 103	ZL 140	– –
418	30	388	ZL 87	ZL 121	ZL 178	– –
446	30	416	ZL 87	ZL 121	ZL 121	ZL 87
468	30	438	ZL 86	ZL 87	ZL 87	ZL 178
496	30	466	ZL 121	ZL 121	ZL 103	ZL 121
518	30	488	ZL 86	ZL 103	ZL 121	ZL 178
546	30	516	ZL 39	ZL 121	ZL 178	ZL 178

How is the strain relief applied?

The strain relief itself should be fitted with two power cable ties on each side of the cable and secured approx. 20 to 30 x cable diameters away from the last moving chain link.

The strain relief is suitable for cables up to approx. 40 mm in diameter.

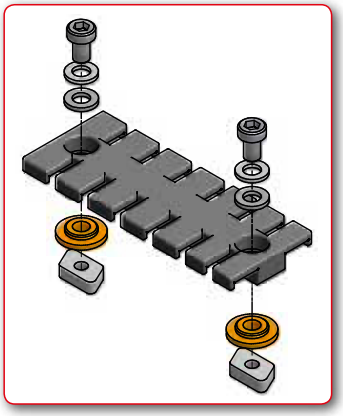
All electric cables must be relieved of strain at both the moving and fixed end. For longer travel distances (and gliding applications), strain relief on one side at the moving end is recommended. Care must be taken to ensure pressure on the power cabling is applied broadly across its outer jacket.

Strain relief plate, type ZL-C set and ZL

The ZL-C set and ZL type strain relief plates are used for strain relief when laying various different cables on machines and installations. When used in cable drag chains, the cables are secured to the strain relief plates on both sides of the chain with type KB 28 power cable ties (order no.: 87661258).

The undercut on the strain relief plates prevent the power cable ties from slipping off, even when the routed cable diameter is itself larger than the plate tongue. Every cable is clamped twice at each end with cable ties.

The actual strain relief is accomplished using cable ties. We recommend using our own type KB power cable ties. These are equipped with a special locking mechanism and are especially suitable for heavy-duty applications. Wide, highly flexible power cable ties increase the surface pressure and ensure longer service life.

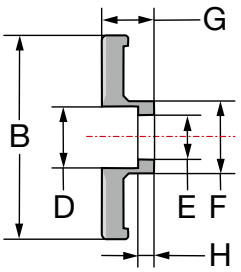


ZL-C set

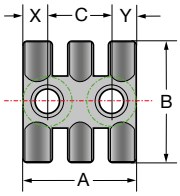
In addition to a type ZL strain relief plate, the ZL-C sets contain a complete set of installation materials, such as washers, serrated and spacer washers, plus T-slot nuts for installation in the C-rail.

Legend for dimensions (in mm)
Z = Installation width = C+X+Y
A = Length
B = Width
C = Hole spacing
X = Hole spacing to edge
Y = Hole spacing to edge
Z = Installation width
D = Inside diameter (above)
E = Inside diameter (below)
F = Outside diameter (below)
G = Assembly height
H = Material thickness

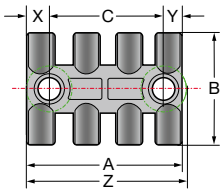
Cross-section



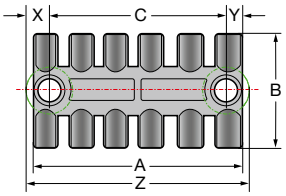
Type	ZL-C 39 set		Type	ZL 39
Order no.	87702810		Order no.	87701014
A =38.5 mm	X =9.0 mm			
B =40.0 mm	Y =9.0 mm			
C =19.5 mm				
D =12.0 mm	G =10.0 mm			
E =9.0 mm	H =3.1 mm			
F = 14 mm				



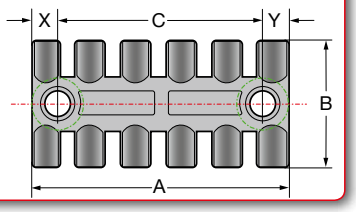
Type	ZL-C 60 set		Type	ZL 60
Order no.	87702812		Order no.	87701016
A =99.5 mm	X =9.0 mm			
B =40.0 mm	Y =7.0 mm			
C =43.5 mm	Z =61.5 mm			
D =12.0 mm	G =10.0 mm			
E =9.0 mm	H =3.1 mm			
F = 14 mm				



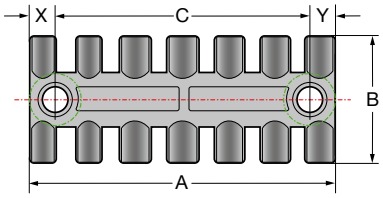
Type	ZL-C 80 set		Type	ZL 80
Order no.	87702814		Order no.	87701015
A =79.5 mm	X =5.7 mm			
B =40.0 mm	Y =5.7 mm			
C =68.0 mm	Z =86.0 mm			
D =12.0 mm	G =10.0 mm			
E =9.0 mm	H =3.1 mm			
F = 14 mm				



Type	ZL-C 87 set		Type	ZL 87
Order no.	87702816		Order no.	87701018
A =86.5 mm	X =9.0 mm			
B =40.0 mm	Y =9.5 mm			
C =68.5 mm				
D =12.0 mm	G =10.0 mm			
E =9.0 mm	H =3.1 mm			
F = 14 mm				

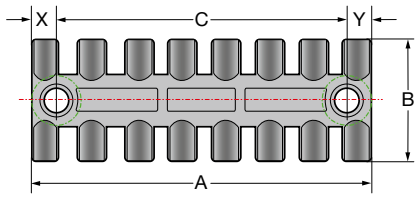


Type	ZL-C 103 set			Type	ZL 103	
Order no.	87702818			Order no.	87701020	
A =102.5 mm	X =9.0 mm	D =12.0 mm	G =10.0 mm			
B = 40.0 mm	Y =9.5 mm	E =9.0 mm	H =3.1 mm			
C = 19.5 mm		F = 14 mm				

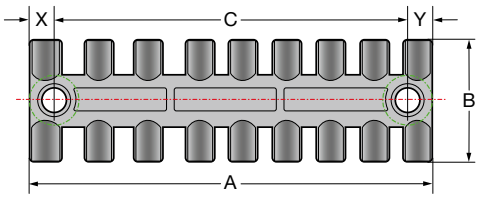


Strain relief plate, type ZL / two-tier strain relief plate

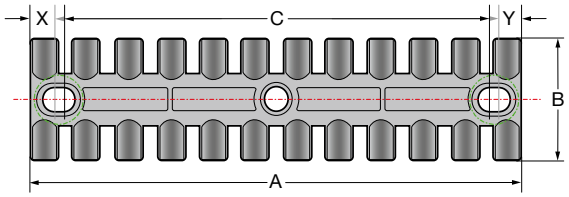
Type	ZL-C 121 set	Type	ZL 121
Order no.	87702820	Order no.	87701022
A =121.0 mm	X =9.0 mm	D =12.0 mm	G =10.0 mm
B = 40.0 mm	Y =9.5 mm	E = 9.0 mm	H =3.1 mm
C =102.5 mm		F = 14 mm	



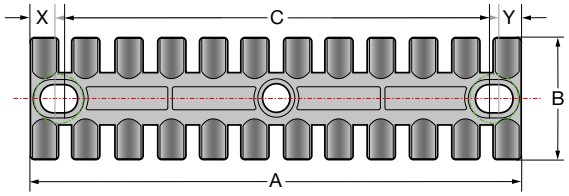
Type	ZL-C 140 set	Type	ZL 140
Order no.	87702822	Order no.	87701024
A =139.5 mm	X =9.0 mm	D =12.0 mm	G =10.0 mm
B = 40.0 mm	Y =9.5 mm	E =9.0 mm	H =3.1 mm
C =121.5 mm		F = 14 mm	



Type	ZL-C set 180/6	Type	ZL 180/6
Order no.	87702824	Order no.	87701026
A =177.9 mm	X =9.0-11.7	D =12.0 mm	G =11.5 mm
B = 42.0 mm	Y =9.0-11.7	E =9.0 mm	H =3.2 mm
C =154.5–160 mm		F = 16 mm	

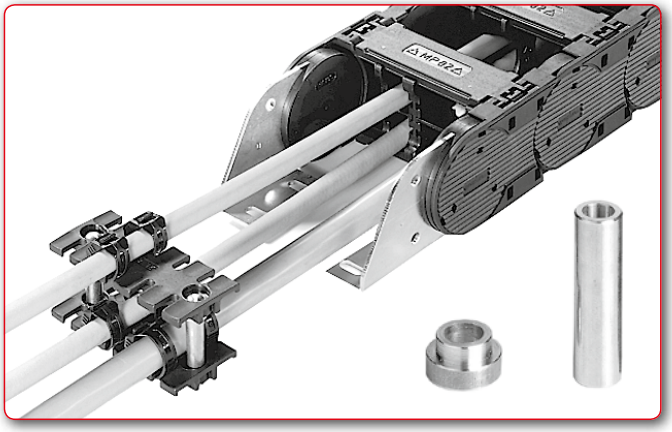


Type	Not a set	Type	ZL 180/8
Order no.	– –	Order no.	87701027
A =177.9 mm	X =9.0-11.7	D =13.5 mm	G =11.5 mm
B = 42.0 mm	Y =9.0-11.7	E =11.0 mm	H =3.2 mm
C =154.5–160 mm		F = 16 mm	

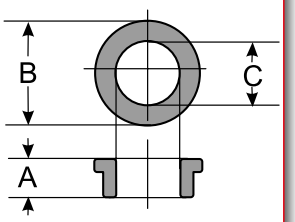


Two-tier installation

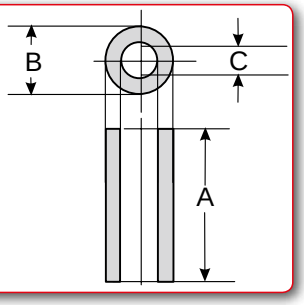
When deploying a shelving system and to achieve higher packing densities, you can also install two strain relief plates above each other. The necessary distance between the levels is ensured by using type DH stand-offs.



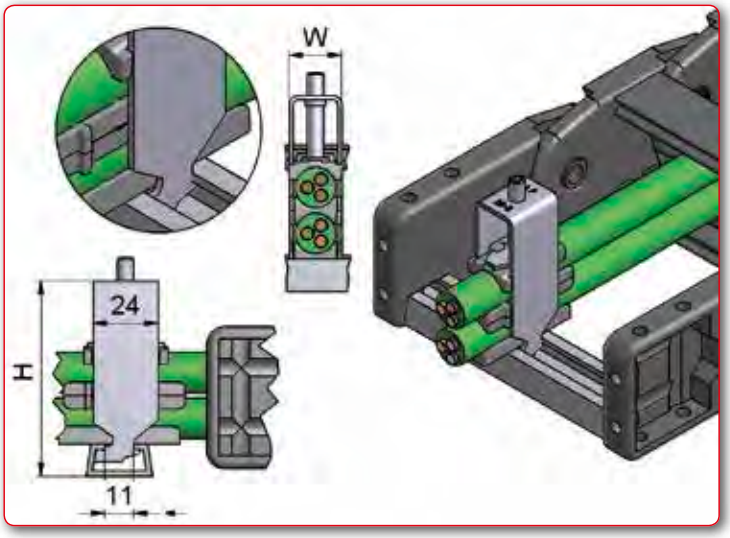
Type	ELB / 6
Order no.	87701050
A = 6.5 / B = 12.0 / C = 6.2	
Type	ELB / 8
Order no.	87701060
A = 6.5 / B = 13.4 / C = 8.2	
Dimensions in mm	



Type	DH 32/6
Order no.	87701052
A = 32.0 / B = 12.0 / C = 6.3	
Type	DH 32/8
Order no.	87701062
A = 32.0 / B = 13.0 / C = 8.3	
Dimensions in mm	



Steel Fix bow clamp



A permanently integrated C-section rail (cathodic dip painted, order no. 81661610) 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 slot width of 11 mm. Due to the design of the trough elements a cable preserving cable guidance is ensured. Adjusted to all chain inside widths up to 200 mm in size. May be assembled on the inside and outside flexure curves at both chain endings.

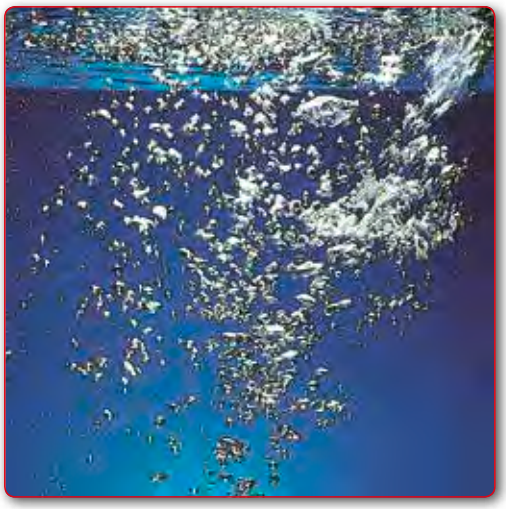
A stainless steel model is also available.

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.	Cable Ø	Width (W)	Height (H)*	Pitch (T)
Single hooped clamp (for 1 cable)					
STF 12-1 Steel Fix	81661801	6 – 12	16	55	24
STF 14-1 Steel Fix	81661802	12 – 14	18	52	24
STF 16-1 Steel Fix	81661803	14 – 16	20	54	24
STF 18-1 Steel Fix	81661804	16 – 18	22	56	24
STF 20-1 Steel Fix	81661805	18 – 20	24	59	24
STF 22-1 Steel Fix	81661806	20 – 22	26	61	24
STF 26-1 Steel Fix	81661807	22 – 26	30	70	24
STF 30-1 Steel Fix	81661808	26 – 30	34	74	24
STF 34-1 Steel Fix	81661809	30 – 34	38	78	24
STF 38-1 Steel Fix	81661810	34 – 38	42	82	24
STF 42-1 Steel Fix	81661811	38 – 42	46	91	24
Double hooped clamp (for 2 cables)					
STF 12-2 Steel Fix	81661821	6 – 12	16	73	24
STF 14-2 Steel Fix	81661822	12 – 14	18	74	24
STF 16-2 Steel Fix	81661823	14 – 16	20	82	24
STF 18-2 Steel Fix	81661824	16 – 18	22	86	24
STF 20-2 Steel Fix	81661825	18 – 20	24	91	24
STF 22-2 Steel Fix	81661826	20 – 22	26	95	24
STF 26-2 Steel Fix	81661827	22 – 26	30	108	24
STF 30-2 Steel Fix	81661828	26 – 30	34	121	24
STF 34-2 Steel Fix	81661829	30 – 34	38	129	24
Triple hooped clamp (for 3 cables)					
STF 12-3 Steel Fix	81661841	6 – 12	16	98	24
STF 14-3 Steel Fix	81661842	12 – 14	18	98	24
STF 16-3 Steel Fix	81661843	14 – 16	20	105	24
STF 18-3 Steel Fix	81661844	16 – 18	22	111	24
STF 20-3 Steel Fix	81661845	18 – 20	24	118	24
STF 22-3 Steel Fix	81661846	20 – 22	26	130	24

** Total height with max. cable diameter, including C-rail*

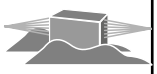
Appendix:
Protection/combustion classes
Materials and properties



Protection classes EN 60529

An important element for housings is protection of integrated elements against drilling, foreign particles and water. The various protection properties are divided into
IP classes (IP = international protection). The framework conditions that a protection class must guarantee are laid out in DIN 40050 and IEC-EN 60529.

IP protection classes are indicated through a two digit code (IPXX). The first digit indicates protection against contact and foreign particles, the second the water protection factor.
Accordingly the class IP65 is completely protected against contacts, dustproof (1st digit = 6) and is protected against jets of water from a nozzle in all directions (2nd digit = 5).

First index No.	Contact protection	Foreign particle protection	Second index No.	Brief description	Water protection
0	No protection		0	No protection	
1	Protected against solid foreign objects of 50 mm and larger	The object probe, a sphere of 50 mm in diameter, must not fully penetrate. 	1	Protected against vertical falling drops of water	Drops which fall vertically must not have any harmful effect. 
2	Protected against solid foreign substances of 12.5 mm dia. and above.	The object probe, a sphere of 12.5 mm in diameter, must not fully penetrate. 	2	Protected against diagonally falling (up to 15°) drops of water	Drops which fall vertically must not have any harmful effects if the housing is inclined at an angle of up to 15° at either side of the perpendicular. 
3	Protected against solid foreign substances of 2.5 mm dia. and above.	The object probe of diameter 2.5 mm must not penetrate at all. 	3	Protected against diagonally falling spray (up to 60°)	Water which is sprayed at an angle of up to 60° from either side of the perpendicular must not have any harmful effects. 
4	Protected against solid foreign substances of 1.0 mm dia. and above.	The object probe of diameter 1.0 mm must not penetrate at all. 	4	Protected against spray from all directions	Water splashing against the enclosure from one direction shall have no harmful effect. 
5	Dustproof	The ingress of dust is not fully prevented; however, it must not penetrate to such an extent that satisfactory operation or safety are impaired. 	5	Protected against jets of water (nozzle)	Water which is sprayed in a jet against the housing from any direction must not have any harmful effects. 
6	dust-tight	No ingress of dust. 	6	Protected against strong water jets (flooding)	Water projected in powerful jets from any direction against the housing shall have no harmful effects. 
			7	Protected against the effect of temporary immersion in water	Water must not penetrate to an extent that will cause harmful effects if the housing is temporarily submerged in water under pressure and under time conditions. 
			8	Protected against the effect of temporary submersion in water	Water must not penetrate to such an extent that it will cause harmful effects if the housing is permanently submerged in water. 
			9k	Protection against highly pressurised water/steam jet cleaning	IP x9K according to DIN 40050 Water jet at 0°, 30°, 60° and 90° Cycle: 30 seconds each Distance: 10 - 15 cm Water volume: 14 – 16 litres per minute Water temperature: 80 °C +/- 5 °C Water pressure: 80-100 bar 

Description of fire classifications according to UL 94

Fire classification HB

The material burns slowly in the horizontal combustion test. The rate of combustion must not exceed 3 inch/min. for wall thicknesses of up to 3 mm, and 1.5 inches/min. for wall thicknesses over 3 mm. Any materials exceeding these combustion rate limits are not registered by UL.

Fire classification V2

In the vertical combustion test, self-extinguishing must occur after an average of 25 seconds (individual values not to exceed 30 seconds). Any dripping material may ignite cotton wool located underneath. However, any afterglow must not exceed 60 seconds.

Fire classification V1

In the vertical combustion test, self-extinguishing must also occur after an average of 25 seconds (individual values not to exceed 30 seconds). However, any possible dripping material must not ignite the cotton wool. Any afterglow must not exceed 30 seconds.

Fire classification V0

In the vertical combustion test, self-extinguishing must occur after an average of less than 5 seconds (individual values not to exceed 10 seconds).
Any material dropping off must not ignite cotton wool placed underneath and any afterglow must not exceed 30 seconds.

Description of fire classification according to DIN 5510

Combustion class S4

Test procedure: acc. to DIN 54837

Requirements:
- Length of the destroyed area: ≤ 20 cm
- No afterburning

Products may also be assigned to combustion class S4 if afterburning occurs within the burnt testing area and the average duration of afterburning does not exceed 10 seconds. If afterburning occurs in the undamaged area of the test piece, the product must not be assigned to combustion class S4.
If the afterburning of a test object lasts longer 120 seconds, such products must not be assigned to combustion class S4.

Burning behaviour

The flame-retardant properties of Murrplastik drag chains meet various classifications:

Test procedures acc. to VDE 0304 Parts 3/5.70
Classification: IIc

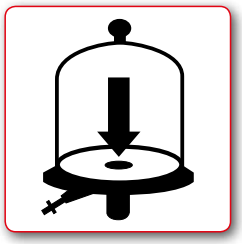
Testing based on "UL 94 – Standard Tests for Flammability of Plastic Materials for Parts in Devices and Appliances"
Classification: 94 HB with a 3.2 and 1.6 mm body thickness

Tested acc. to DIN 4102 "Fire behaviour of building materials and elements"
Classification: Materials class B2

In case of more stringent applications please contact us.

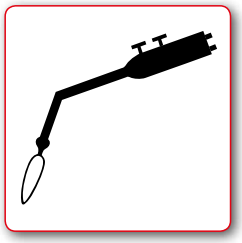
Radiation resistance

Murrplastik drag chains are very resistant to radiation. In the range of 8 x 10^6 Gy gamma radiation, the mechanical properties change very little.



Vacuum

Murrplastik plastic cable drag chains may be safely used in a vacuum. Gas will only be given off in very low amounts.



Welding flashes and hot sparks

For cables on robotic welding machines, Murrplastik cable drag chains offer the best line protection possible. This has been demonstrated both in laboratory testing and numerous references. The material may appear optically impaired but in no way will its function be reduced. Murrplastik cable drag chains have successfully passed tests involving medium-sized hot metal swarf at 500 °C.

Use in EX explosion proof areas

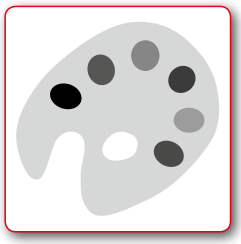
The Murrplastik cable drag chain may be used in explosion proof areas if manufactured to specification with a special material and if the standard regulations are observed. All Murrplastik cable drag chains are certified based on ATEX-Europa guideline 94/9 EG and can be deployed safely in the corresponding areas.

Weatherproof

Murrplastik cable drag chains are suitable for outdoor applications. Experience has shown that the mechanical properties are not impaired.

Use in clean rooms

Murrplastik uses a special material. This reduces even further the very low wear of a normal chain. In many applications in which difficult special conditions apply, the cable drag chain can still be used. An intensive test program can be set up to verify its suitability in self-supporting and gliding applications.



Special colours

Cable drag chains can be supplied in colours other than black on request. Several colours can also be combined where colour-psychological effects are desired. Minimum order quantities and special prices apply.

Use in cold storage

Chain made of a special material can be supplied for use in cold storage.

Parts made of plastic / standard material

Murrplastik drag chain has been developed for use in extreme conditions. The standard material is glass fibre reinforced plastic in standard black.

Characteristics

The PA (polyamide) we have developed meets stringent requirements for high mechanical capability regarding strain, pressure, torsion and free running. For specific, problematic scenarios (e.g. clean-room applications, specific climatic requirements, deployment in hygienically demanding environments), we draw on our long-standing experience to offer modified materials and can hence offer a solution to match almost any scenario.

The drag chain plastic is free of halogens, silicones and hard metals such as lead and cadmium. No formaldehydes are used in manufacturing.

Mechanical properties		Test	Test value	Unit
Tensile strength (DIN 53 455)		dry	190	N/mm²
		humidity	120	N/mm²
Crack resistance (DIN 53 455)		dry	4	%
		humidity	6	%
Elasticity module	Tensile test	dry	7000	N/mm²
		humidity	10000	N/mm²
Impact resistance (DIN 53 455)	23 °C	dry	60	kJ/m²
	23 °C	humidity	75	kJ/m²
	-40 °C	dry	50	kJ/m²
Creep module E	23 ... 50 °C	humidity	5400	N/mm²
	120 °C	dry	2100	N/mm²
Heat conductivity			0.3	W/k x m
Static electricity value (DIN 53 455)		dry	3.8	MHz
		humidity	6.8	MHz
Special volume resistance		dry	10^{15}	Ω x cm
		humidity	10^{12}	Ω x cm
Impact resistance	Thickness 0.6 ... 0.8 mm		80	kV/mm
Surface resistance ROA		dry	10^{12}	Ω
		humidity	10^{10}	Ω
Moisture absorption	23 ... 25 °C		1.8±0.2	%

Temperature limits	
permissible temperature	-30 ... 100 °C
5000 hours	up to 135 °C
several hours	up to 170 °C

Other properties		
Density	dry	1.4 g/cm²
Coefficient of sliding friction	unlubricated	0.3–0.45
Combustion profile	DIN VDE 0304 Part 3	
Fire classification acc. to UL	HB	

Parts made of metal / standard material

The advantage of using light metal for certain parts lies in the combination of its mechanical strength, resistance to chemical attack and its physical properties.

Murrplastik use a special aluminium alloy with the following properties. It stands out due to the following characteristics:

- light, stable, hard and smooth
- visually appealing
- very low friction and wear profile for this light metal against cabling materials
- no tendency to become brittle at low temperatures
- brine-resistant

Aluminium is used by Murrplastik for the following products: Cross member profiles and profiles for variable guide channel system VAW.

Directives: What's meant by these abbreviations?

The use of specific materials in vehicles, as in electric and electronic devices, is restricted and/or forbidden by a set of European directives. Various associations and fabricators have published their own lists of materials considered undesirable.

RoHS Directive 2002/95/EC

(RoHS = Restriction of the use of certain Hazardous Substances in electrical and electronic equipment)

The guidelines limiting specific hazardous materials in electric and electronic devices categorised the following materials and their compounds as dangerous: lead, mercury, cadmium, chrome 6, polybrominated biphenyl (PBB) and polybrominated diphenyl ether (PBDE).

VDA Lists

(VDA = Verband der Automobilindustrie in Deutschland, German Automotive Industry Association)

Alongside the legal stipulations, there are also a variety of material and declaration lists prescribed by various associations and fabricators. They contain materials and material groups that are undesirable or forbidden from the corresponding processing branch for a variety of reasons. Several of the most well-known lists are shown in the following, their content drawn from other sources and in some cases expanded: VDA list 232-101 for notifiable materials; Bosch Standard N 2580. The VDA list is part of the ILRS list ("List for materials in automobile manufacture requiring declaration-substances in components and raw materials") that is used in the IMDS (International Material Data System).

ELV Directive 2000/53/EC

(ELV = End-of-Life Vehicles)

The heavy metals listed in the ordinance (ELV) are a portion of those named in the RoHS guidelines, including lead, mercury, cadmium, chrome 6.

WEEE Directive 2002/96/EC

(WEEE = Waste from Electric and Electronic Equipment)

Goal of the guidelines is the avoidance of waste from electric and electronic devices, as well as their recovery and recycling. They require selective handling of used devices with specific critical materials, as named in the guideline appendices.

Chemical resistance of plastics

Reagent	Concen-tration %	At + °C	Polyethylene PE	Polyamide PA6	Polyamide PA 12	Polypropylene PP	Polyurethane PU
Acetaldehyde	100	20	+	40% o	+		+
Acetic acid	10	20	+o	o	+	o	
Acetone	100	20	++	+	+	-	
Allyl alcohol	96	20		30% o	o	+	-
Alum, aqueous	diluted	40			+	+	
Aluminium chloride, aqueous	diluted	40	+		+	+	+
Aluminium sulphate, aqueous	diluted	40	+			+	+
Ammonia, aqueous	any	20	+	20% +		+	o
Ammonium chloride, aqueous	any	60	+		o	+	+
Ammonium nitrate, aqueous	diluted	40	+			+	+
Ammonium sulphate, aqueous	diluted	40	+			+	+
Aniline chlorohydrate, aqueous	saturated	20					
Aniline, pure	100	20	+	o	o	+	-
Benzahldehyde, aqueous	0,3	20	-	pure o	o	+	
Benzine	100	20	-	+	+	o	+
Benzoic acid	any	40	+		o	+	+
Benzol	100	20	-+	+	o	-	
Bleaching lye	12.5 Cl	20		-	o	o	
Boracic acid, aqueous	diluted	40	+	o	+	+	-
Borax, aqueous	diluted	40		o	+	+	
Boron	50	40		o			
Bromine, liquid	100	20	-	-	o	-	-
Butane diol	10	20		pure +		+	o
Butanol	100	20				+	+
Butyl acetate	100	20				o	-
Butyl alcohol	100	20	-			+	o
Calcium chloride, aqueous	any	40	+	+	o	+	+
Calcium nitrate, aqueous	50	40	+			+	+
Caustic potash solution	50	20		50% +		+	o
Chlorine	any	20	-	-	-	-	-
Chromic alum, aqueous	diluted	40				+	
Crystallisable acetic acid	100	20			o	+	
Cyclohexanol	100	20		+		+	-
Ethyl acrylate/acrylic resin lacquer	100	20	-	30% -	-		
Ethyl alcohol, aqueous	10	20		o		+	+
Ethyl ether	100	20		30% +		o	-
Ethylene chloride	100	20				o	-
Ethylene oxide, liquid	100	20					
Exhaust gases containing carbon dioxide	any	60				+	+
Exhaust gases containing carbon oxide	any	60				+	+
Fluorine	50	40		-			
Formaldehyde, aqueous	diluted	40	+	pure +	o	+	o
Formic acid, aqueous	100	20		10% o	-	+	-
Glucose, aqueous	any	20	+			+	+
Hydrobromic acid, aqueous	10	40	+	-		+	-
Hydroxylamine sulphate, aqueous	12	35					+
Iron chloride, aqueous	10	40	+	o	+	+	+
Methyl chloride	100	20					
Potassium bromide, aqueous	any	60	+	10% +		+	o
Potassium ferrocyanide, aqueous	any	60	o			+	
Urea, aqueous	10	40		20% +		+	+

The information provided above enables an initial choice to be made. However, it is not intended as a guarantee of particular properties of the products or their suitability for a particular application. It does not release the buyer from the duty of carrying out suitability checks.

+ means: resistant
o means: limited resistance
- means: not resistant

Reagent	Concentration %	At + °C	Polyethylene PE	Polyamide PA6	Polyamide PA 12	Polypropylene PP	Polyurethane PU
Carbon bisulphide	100	20	-	o	+	+	+
Carbon dioxide	100	60	+			+	+
Carbon oxide	100	60	+			+	+
Carbon tetrachloride	100	20		+	o	o	+
Citric acid	10	40	+			+	o
Copper chloride, aqueous	saturated	20	+			+	+
Copper sulphate, aqueous	any	40	+			+	+
Cresol, aqueous	90	20	-	pure -	-	+	-
Hydrochloric acid	10	30-40					
Hydrochloric acid, aqueous	10	20	+	20% -	o	+	-
Hydrogen	100	60		+			+
Hydrosilicofluoric acid	30	20	-				
Lactic acid, aqueous	50	20	o	pure +	o	+	o
Magnesium carbonate	any	20					+
Magnesium chloride, aqueous	any	20	+	10% o		+	+
Mercury		60	+	+	+	+	+
Methyl alcohol	100	20	+			+	o
Methylene chloride	100	20		o	o	-	-
Nickel chloride, aqueous	any	20		10% o		+	+
Nickel sulphate, aqueous	any	20	+	10% o		+	+
Nitric acid, aqueous	6	20	+	50% -	-	+	-
Nitroglycerine	diluted	20					
Oils and greases		20	o	+	+	+	+
Oleic acid	100	20		+		+	o
Oxalic acid	saturated	20	+	10% o		+	o
Ozone	100	20	o	o	+	o	o
Petroleum							+
Phosgene, liquid	100	20					-
Phosphoric acid, aqueous	diluted	20	+	10% -	o	+	o
Phosphorus pentoxide	100	20				+	
Photographic developer		40				+	
Potash, aqueous	saturated	40			+		+
Potassium chloride, aqueous	any	20	+	10% +		+	+
Potassium dichromate, aqueous	40	20				+	+
Potassium nitrate	any	20	+	10% +	+	+	+
Potassium permanganate, aqueous	6	20	+		o	+	-
Potassium persulphate, aqueous	diluted	40	-		+	+	+
Salt solution	any	40			+	+	+
Seawater		40	+	+	o	+	+
Soap solution, aqueous	concentrated	20		o		+	+
Soda lye, aqueous	10	20	+	+	+	+	o
Sodium chlorate, aqueous	any	20	+	10% o		+	
Sodium sulphide, aqueous	diluted	40				+	
Sulphuric acid	10	20	+	40-80% -	o	+	+
Tin chloride, aqueous	diluted	40			+	+	+
Toluene	100	20	-	+	+	o	+
Trichloroethylene	100	20	-	o		o	-
Vinyl acetate	100	20					-
Xylene	100	20		+	+	o	+
Zinc chloride, aqueous	diluted	60	+	10% o	o	+	+
Zinc sulphate, aqueous	diluted	60	+			+	+

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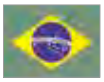
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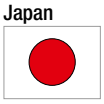

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All details given in our sales material prospectuses and catalogues as well as the information available online are based on our current knowledge of the products described.

The electronic data and files made available by Murrplastik, particularly CAD files are based on our current knowledge of the product described.

A legally binding assurance of certain properties or the suitability for a certain purpose can not be determined from this information.

All information with respect to the chemical and physical properties of Murrplastik products as well as application advice given verbally, in writing or by tests, is given to the best of our knowledge.

This does not free the purchaser of carrying out their own inspections and tests in order to determine the suitability of a product for a specific purpose.

Murrplastik accepts no responsibility for the available information being up-to-date, correct or complete. Neither do we accept responsibility for the quality of this information.

Murrplastik accepts no liability for damage caused as a result of using our products.

Murrplastik reserves the right to make technical changes and improvements through constant further development of products and services.

Our General Terms and Conditions apply.

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