



E2 R

e-tubes for swarf protection at higher speeds and smooth running



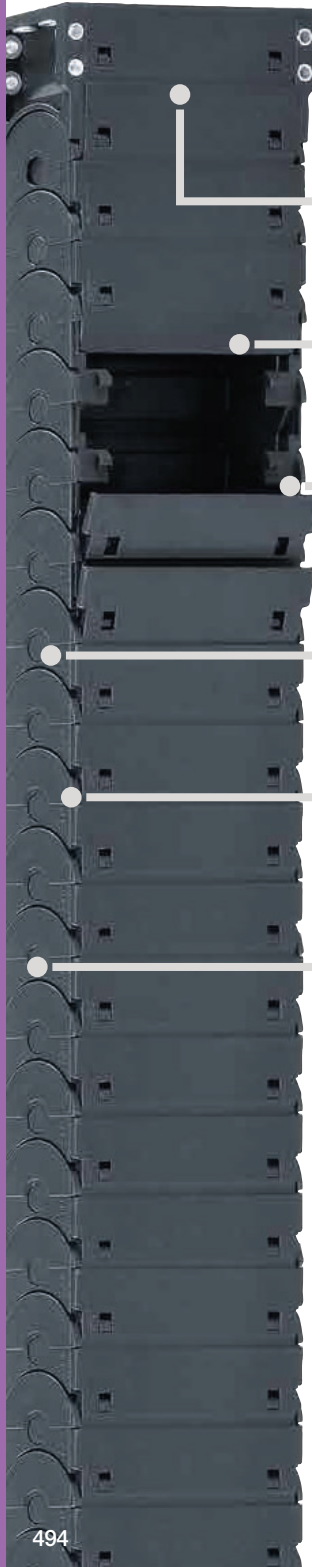
Advantages of the E2 R series:

- Strong e-tubes with small pitch for low noise, smooth running
- High level of protection against swarf (including hot swarf)
- Lids removable along the outer radius
- Robust and sealed
- Space-efficient with optimised ratio of inner to outer dimensions



When to use another e-tube:

- When a particularly cost-effective solution is required
 - ▶ R2.1 e-tubes, page 442
- When no swarf protection is required ▶ E2/000 e-chains®, page 374
- For extremely swarf-resistant e-tubes ▶ RX system, page 516
- When even higher strength is required ▶ R4.1L e-tubes, page 538



Attachment from any side: with KMA mounting brackets

Swarf protection: smooth, swarf-resistant exterior

Fast assembly: lids removable along the outer radius

High strength: large pin/bore and crossbar with high locking force

Smooth running: small pitch for low-noise, smooth running

Strong: double stop-dog system for long unsupported lengths


Swarf protection at higher speeds and smooth running - E2 R e-tubes


E2 R e-tubes - small pitch for higher speeds and smooth motion. igus® e-tubes work in hot swarf areas, in areas of dirt and dust generated by woodworking, steel mills, pulp and paper, textile, agriculture, coal plant and many other hostile environments.


- High level of protection against swarf (including hot swarf)
- Robust and sealed
- Space-efficient with optimised ratio of inner to outer dimensions
- Modular interior separation
- Universal KMA mounting brackets with attachment options from any side

Typical industries and applications

- Machine tools ● Wood processing machines
- General mechanical engineering ● In all areas with dirt and swarf

 e-tubes with igumid HT material for hot swarf up to +850°C available upon request

 Electrically conductive ESD e-tubes upon request

 UL94-V0 classification upon request

 **iF product design award**
1987 igus® series R68

Series	Inner height <i>hi</i> [mm]	Inner width <i>Bi</i> [mm]	Outer width <i>Ba</i> [mm]	Outer height <i>ha</i> [mm]	Bend radius <i>R</i> [mm]	Unsupported length ≤ [m]	Page
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E2 R e-tubes - lids removable along the outer radius

R48	25	25 - 130	36 - 141	36	060 - 250	1.50	498
R58	35	50 - 200	66 - 216	50	075 - 250	2.30	504
R68	45	50 - 250	68 - 268	64	100 - 300	2.50	510



Available from stock. Ready to ship in 48 - 72hrs.*

*Average time before the ordered goods are dispatched.



E2 e-tubes in swarf area of a machine tool. With igumid HT material resistant to swarf up to +850°C

Technical data

	Speed gliding ¹⁾ / acceleration gliding ¹⁾	≤ 3 [m/s] / ≤ 10 [m/s ²]
	Speed FL_G / acceleration FL_G	≤ 10 [m/s] / ≤ 100 [m/s ²]
	Speed FL_B / acceleration FL_B	≤ 3 [m/s] / ≤ 6 [m/s ²]
	Material - permitted temperature °C, igumid G	-40°C / +120°C
	Flammability class, igumid G	VDE 0304 IIC UL94-HB

FL_G = unsupported with straight upper run FL_B = unsupported with permitted sag

¹⁾ Gliding applications for long travels are available upon request, please consult igus®.

Installation types, maximum travels

Series	Unsupported	Gliding ¹⁾	Vertical hanging	Vertical standing	Side mounted unsupported	Zig-zag	Unsupported lower run
R48	$\leq 3.00m$	$\leq 50m$	$\leq 50m$	$\leq 4.0m$	$\leq 1.5m$	upon request	upon request
R58	$\leq 4.50m$	$\leq 75m$	$\leq 50m$	$\leq 4.0m$	$\leq 2.0m$	upon request	upon request
R68	$\leq 5.00m$	$\leq 100m$	$\leq 60m$	$\leq 4.0m$	$\leq 2.0m$	upon request	upon request

¹⁾ For gliding applications, please consult igus®.

Options with order keys | Examples based on series R58

Standard NC version - (No Camber) without pretension e-tube - no burning-in of hot swarf up to 850°C ESD - electrically conductive material

Part No. Standard	Part No. NC version	Part No. igumid HT	Part No. igumid ESD
58.100.R.0	58.100.R.0.NC	58.100.R.0.HT	58.100.R.0.ESD

Ready to ship in 48 - 72hrs.* **Ready to ship in 5 business days*** **Ready to ship in 6 weeks*** **Ready to ship in 12 business days***

*Average time before the ordered goods are dispatched.

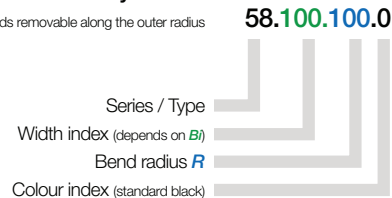
Order example | Order key and colour examples | Examples based on series R58

Order example for complete e-tube (1.0m), colour black, with mounting brackets and interior separation:

e-tube (1.0m)	Please indicate e-tube length or number of links: 1.0m or 28 links	58.100.100.0
+ Mounting brackets	KMA - 1 set	580.100.12
Interior separation	with 2 separators assembled every 2 nd link	2 x 582
Order text:	1m 58.100.100.0 + 580.100.12 + 2 x 582	

Order key

Lids removable along the outer radius



Order index for colour options

Colour	Order index	Colour	Order index
Black	Standard .0	Orange	Special colour .2
Silver-grey	Special colour .31	Yellow	Special colour .4
White	Special colour .1	Light grey	Special colour .14
Grey-white	Special colour .1S		

Black e-chains® ready to ship in 48 - 72hrs.*
Above special colours upon request.

Protection against dirt and debris, small pitch for smooth motion



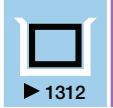
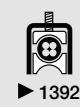
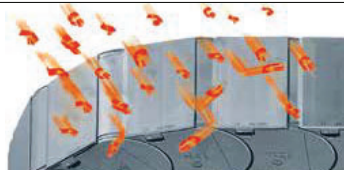
e-tubes | Series R48 | Lids removable along the outer radius

Part No.	<i>B_i</i>	<i>B_a</i>	<i>R</i> Available bend radii										R48			
e-tubes	[mm]	[mm]	[mm]										[kg/m]			
48.025.R.0	25	36	060	075	100	125	150	175	200	250						≈ 0.64
48.050.R.0	50	61	060	075	100	125	150	175	200	250						≈ 0.84
48.075.R.0	75	86	060	075	100	125	150	175	200	250						≈ 1.03
48.100.R.0	100	111	060	075	100	125	150	175	200	250						≈ 1.23
48.130.R.0	130	141	060	075	100	125	150	175	200	250						≈ 1.46

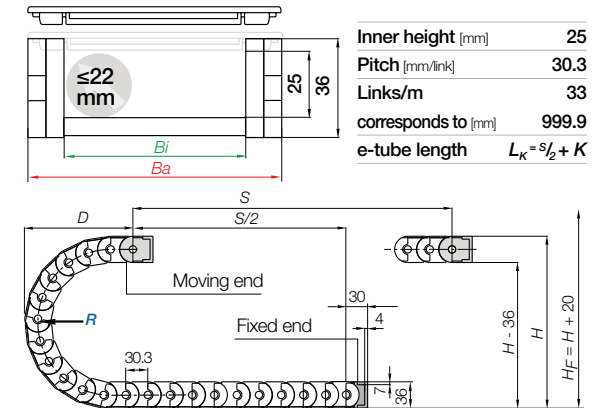
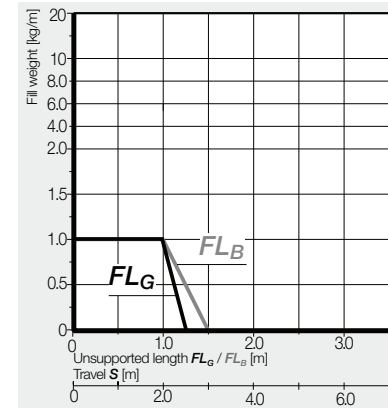
Complete Part No. with required radius (*R*). Example: 48.100.100.0

Hot swarf up to +850°C for e-tubes

- e-tubes can repel swarf up to +850°C. Special production option with the igus® material igamid HT
 - No hot swarf melting or embedding into the chain
- More information ► www.igus.eu/HT



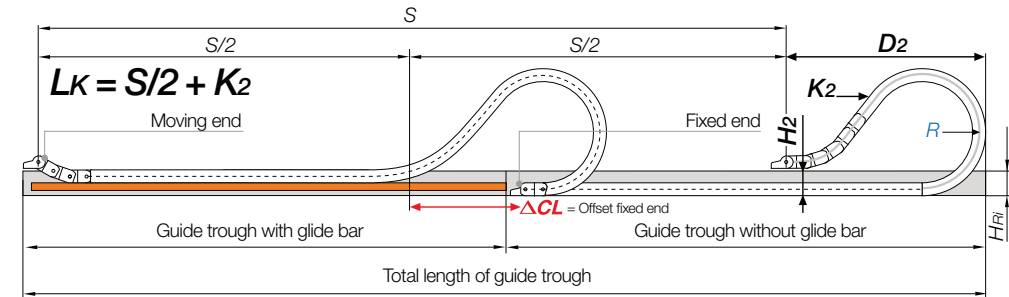
Unsupported applications | Short travels



<i>R</i>	060	075	100	125	150	175	200	250
<i>H</i>	156	186	236	286	336	386	436	536
<i>D</i>	123	138	163	188	213	238	263	313
<i>K</i>	250	300	375	455	535	615	690	850

The required clearance height: $H_F = H + 20\text{mm}$ (with 0.5kg/m fill weight)

Gliding applications | For travel lengths from 5m to max. 50m



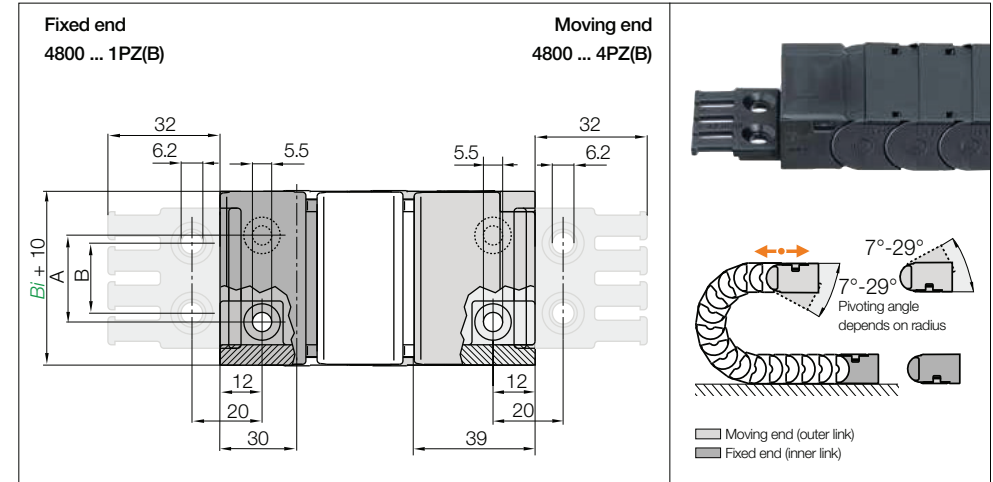
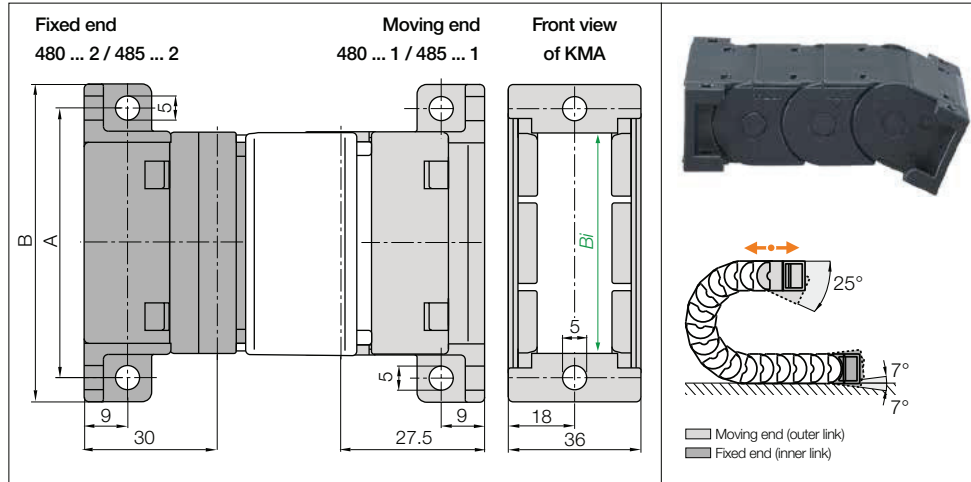
Note: We recommend the project planning of such a system to be carried out by igus®.

In case of travels between 2 and 5m we recommend an e-tube with a longer unsupported length.

If a gliding application is required for a long travel, please consult igus®.

<i>R</i>	060	075	100	125	150	175	200	250
<i>H₂</i>	156	186	176	176	176	176	176	*
<i>D₂</i>	110	125	330	450	610	730	690	*
<i>K₂</i>	250	300	545	758	970	1,151	1,182	*
ΔCL	-	-	170	270	380	470	*	*

*Values upon request



KMA pivoting | Recommended for unsupported applications
KMA locking | Recommended for vertical hanging and standing applications

Width index	Part no. full set KMA pivoting	Part No. full set KMA locking	A [mm]	B [mm]	Bi [mm]
025. ▶	480.025.12	485.025.12	45	55	25
050. ▶	480.050.12	485.050.12	70	80	50
075. ▶	480.075.12	485.075.12	95	105	75
100. ▶	480.100.12	485.100.12	120	130	100
130. ▶	480.130.12	485.130.12	150	160	130

Angled polymer bracket | One end pivoting
 Recommended for unsupported applications

Width index	Part No. full set with tiwrap plates	Part No. full set without tiwrap plates	A [mm]	B [mm]	Number of teeth
025. ▶	4800.025.12PZB	4800.025.12	12	15	3
050. ▶	4800.050.12PZB	4800.050.12	37	30	5
075. ▶	4800.075.12PZB	4800.075.12	62	60	8
100. ▶	4800.100.12PZB	4800.100.12	87	80	10
130. ▶	-	4800.130.12	117	-	-

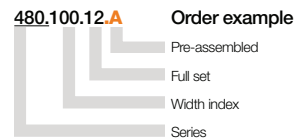
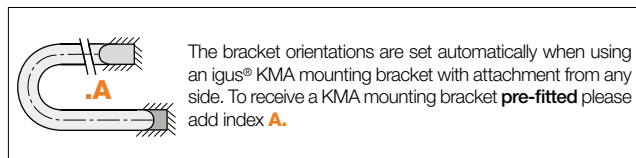
(KMA = polymer metal mounting bracket)

The following parts are required for attachment of the mounting brackets:

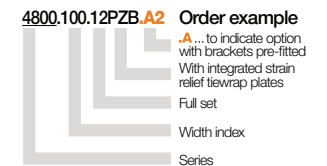
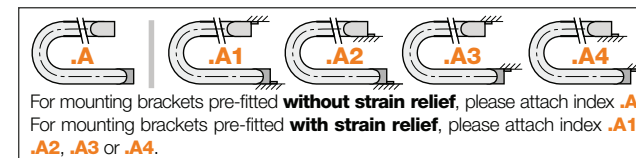
- Socket head cap bolt M5 DIN 912-8.8 Length depends on the thickness of the attachment base
- Washer 5.3 DIN 125-ST
- Hexagon nut M5 DIN 934-8

The following parts are required for attachment of the mounting brackets:

- Socket head cap bolt M5 DIN 912-8.8 Length depends on the thickness of the attachment base
- Hexagon nut M5 DIN 7991
- Washer 5.3 DIN 125-ST

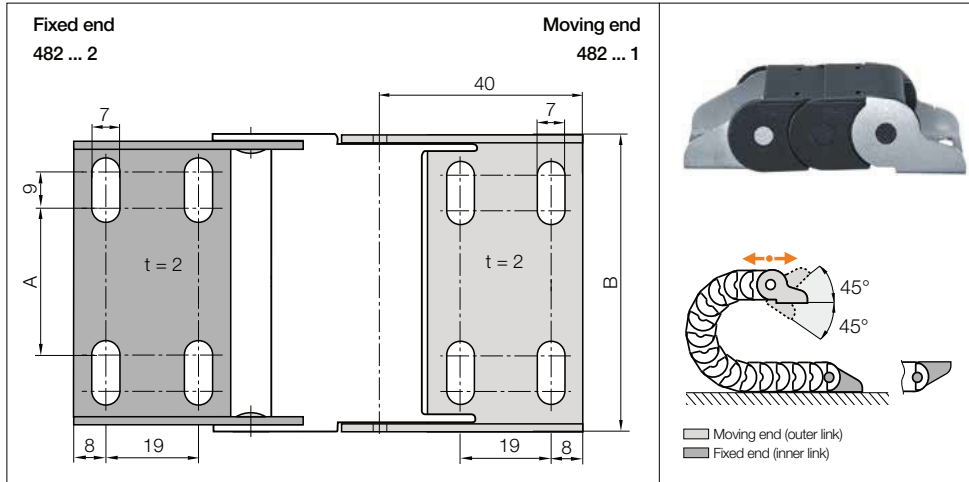


Strain relief e.g. clamps, tiwrap plates, nuggets and clips are available from stock. The complete chainfix range with ordering options ▶ From page 1392



Strain relief e.g. clamps, tiwrap plates, nuggets and clips are available from stock. The complete chainfix range with ordering options ▶ From page 1392

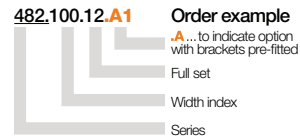
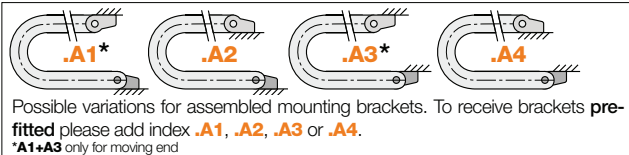
Steel mounting brackets | One end pivoting



Steel mounting brackets | One end pivoting

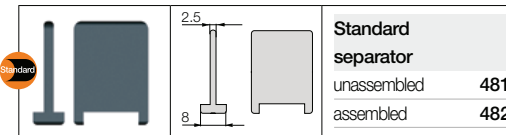
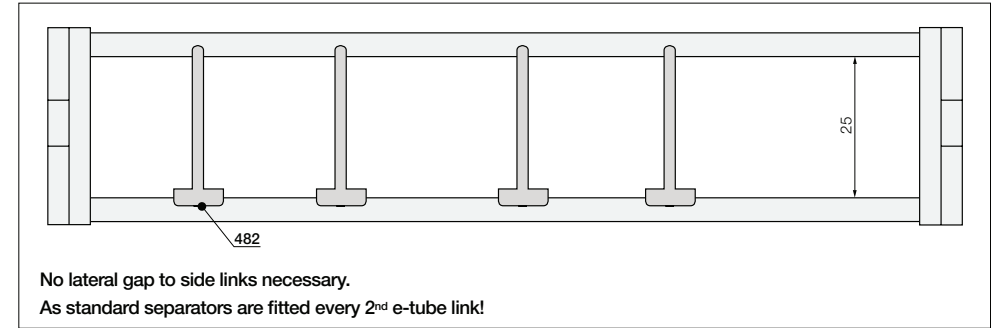
Recommended for unsupported, vertical hanging, standing applications

Width index	Part No. full set	A [mm]	B [mm]
	Steel one end pivoting:		
025. ▶	482.025 .12	–	35
050. ▶	482.050 .12	22	60
075. ▶	482.075 .12	47	85
100. ▶	482.100 .12	72	110
130. ▶	482.130 .12	102	140



Strain relief e.g. clamps, tie-wrap plates, nuggets and clips are available from stock. The complete chainfix range with ordering options ▶ From page 1392

Interior separation



Standard separator
 For simple vertical subdivision. Offers security due to its wide base design, also when used with large cables or hoses.

Separator with integrated strain relief teeth

- Can be integrated into the mounting bracket or placed at any point
 - Combines strain relief and interior separation, for restricted space conditions
 - Strain relief separator is easy to assemble without any screws
- Part No. 481.ZR - more information ▶ From page 1424



Protection against dirt and debris, small pitch for smooth motion

35



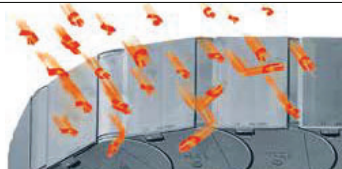
e-tubes | Series R58 | Lids removable along the outer radius

Part No. e-tubes	B_i [mm]	B_a [mm]	R Available bend radii [mm]	R58 [kg/m]
58.050.R.0	50	66	075 100 125 150 200 250	≈ 1.50
58.075.R.0	75	91	075 100 125 150 200 250	≈ 1.77
58.100.R.0	100	116	075 100 125 150 200 250	≈ 2.04
58.125.R.0	125	141	075 100 125 150 200 250	≈ 2.31
58.150.R.0	150	166	075 100 125 150 200 250	≈ 2.61
58.175.R.0	175	191	075 100 125 150 200 250	≈ 2.88
58.200.R.0	200	216	075 100 125 150 200 250	≈ 3.15

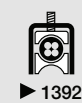
Complete Part No. with required radius (R). Example: 58.100.100.0

Hot swarf up to +850°C for e-tubes

- e-tubes can repel swarf up to +850°C. Special production option with the igus® material igamid HT
 - No hot swarf melting or embedding into the chain
- More information ► www.igus.eu/HT



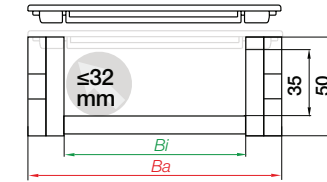
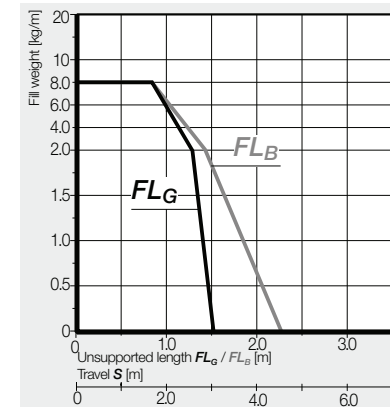
Unsupported applications | Short travels



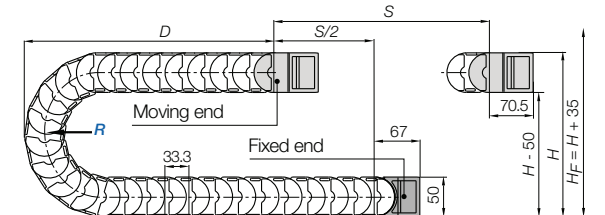
► 1392



► 1318



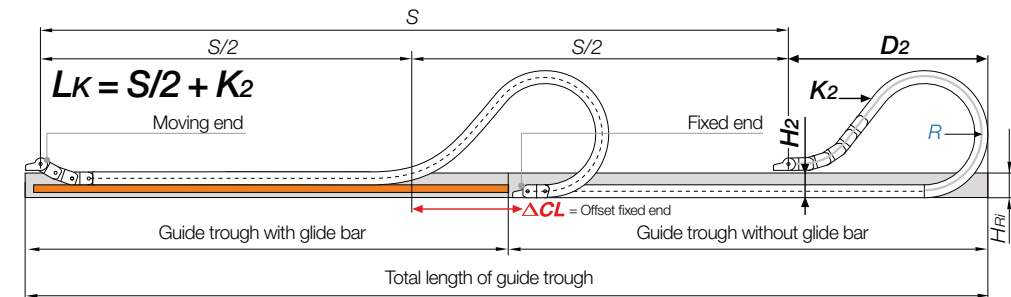
Inner height [mm]	35
Pitch [mm/link]	33.3
Links/m	30
corresponds to [mm]	999
e-tube length	$L_K = S/2 + K$



R	075	100	125	150	200	250
H	200	250	300	350	450	550
D	150	175	200	225	275	325
K	305	385	460	540	695	855

The required clearance height: $H_F = H + 35\text{mm}$ (with 0.5kg/m fill weight)

Gliding applications | For travel lengths from 5m to max. 75m

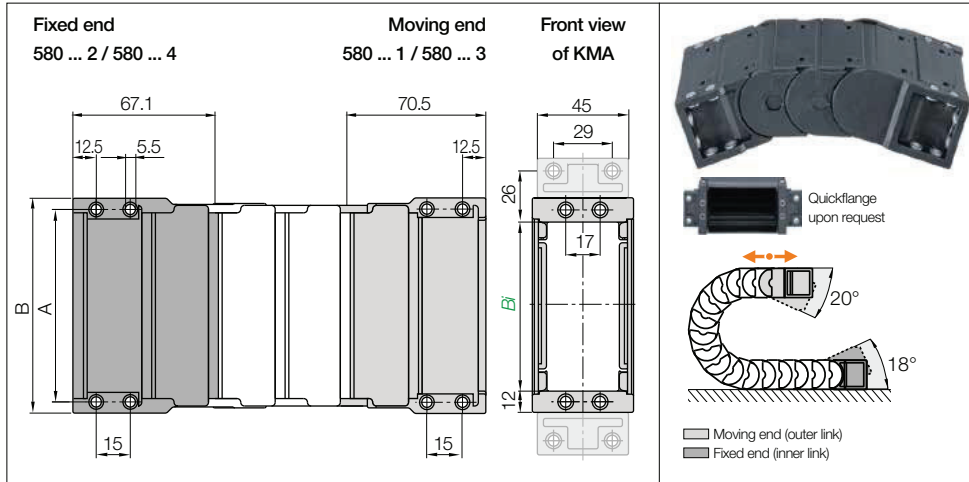
**Note:** We recommend the project planning of such a system to be carried out by igus®.

In case of travels between 3 and 5m we recommend an e-tube with a longer unsupported length.

If a gliding application is required for a long travel, please consult igus®.

R	075	100	125	150	200	250
H_2	150	166	166	166	166	166
D_2	150	310	380	480	800	1,050
K_2	375	500	699	866	1,265	1,665
ΔCL	*	122	167	247	512	717

*Upon request



KMA pivoting | Recommended for unsupported applications
KMA locking | Recommended for vertical hanging and standing applications

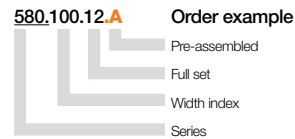
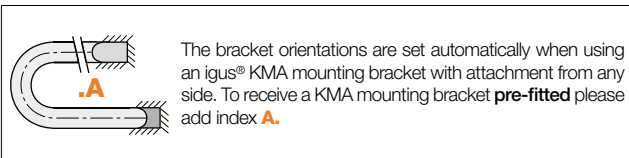
Width index	Part no. full set KMA pivoting	Part No. full set KMA locking	A [mm]	B [mm]	Bi [mm]
050. ▶	580.050.12	580.050.34	62	74	50
075. ▶	580.075.12	580.075.34	87	99	75
100. ▶	580.100.12	580.100.34	112	124	100
125. ▶	580.125.12	580.125.34	137	149	125
150. ▶	580.150.12	580.150.34	162	174	150
175. ▶	580.175.12	580.175.34	187	199	175
200. ▶	580.200.12	580.200.34	212	224	200

(KMA = polymer metal mounting bracket)

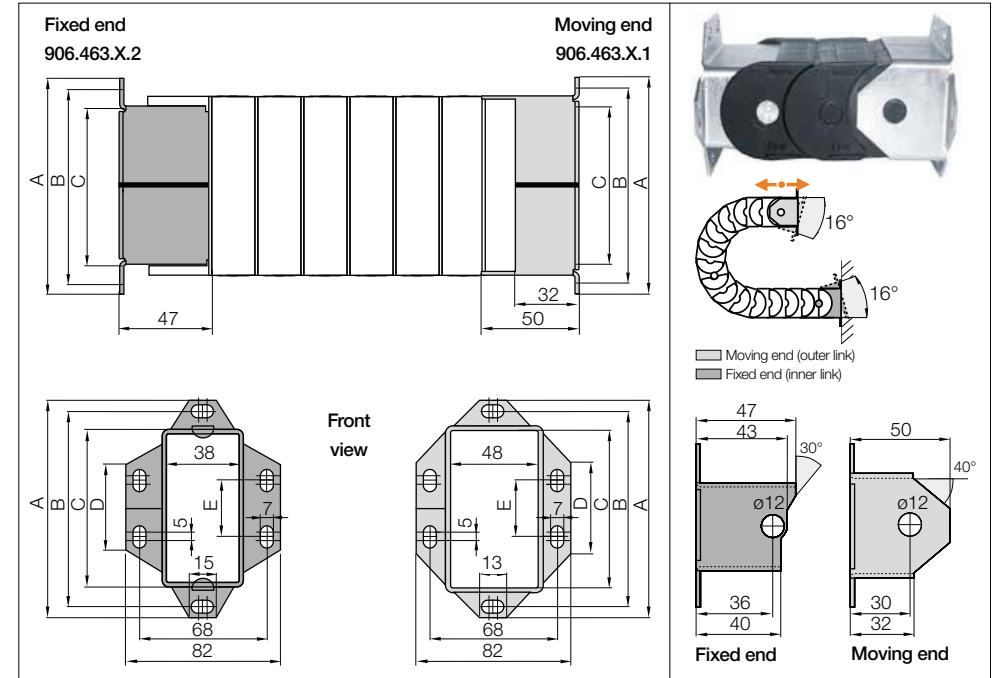
The following parts are required for attachment of the mounting brackets:

- Socket head cap bolt M5 DIN 912-8.8 Length depends on the thickness of the attachment base
- Washer 5.3 DIN 125-ST
- Hexagon nut M5 DIN 934-8

To receive full sets with pre-fitted quickflange please add index QF ▶ For example: Part No. 580.100.12.QF. Unassembled quickflange: Part No. 16800.QF



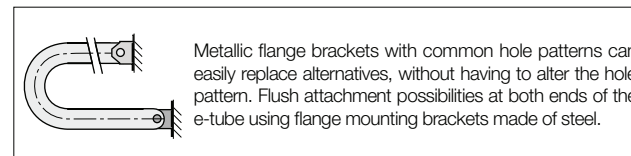
Strain relief e.g. clamps, tiewrap plates, nuggets and clips are available from stock. The complete chainfix range with ordering options ▶ From page 1392



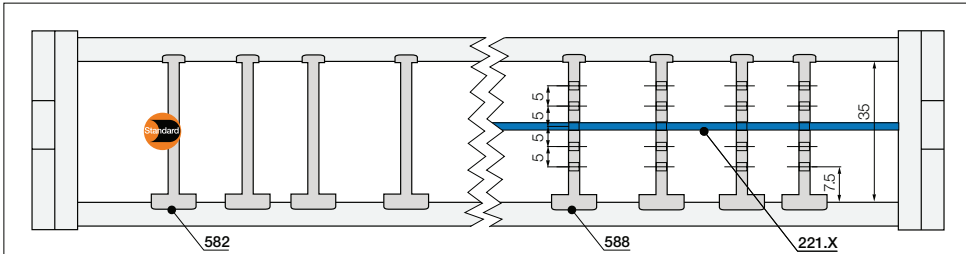
Steel flange, pivoting | Recommended for unsupported applications

Width index	Hole pattern	Part No. Moving end	Bi [mm]	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]
050. ▶	58.05	906.463.05.1	50	90.5	78.5	58.3	24.5	20
075. ▶	58.1	906.463.1.1	75	116	104	83.3	50	30

Width index	Hole pattern	Part No. Fixed end	Bi [mm]	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]
050. ▶	58.05	906.463.05.2	50	90.5	78.5	57.5	28	20
075. ▶	58.1	906.463.1.2	75	116	104	82.5	45	30



Strain relief e.g. clamps, tiewrap plates, nuggets and clips are available from stock. The complete chainfix range with ordering options ▶ From page 1392



No lateral gap to side links necessary.
As standard separators are fitted every 2nd e-tube link!

	Standard separator	
	unassembled	581
assembled	582	

Option 1 | Separators
Standard separator

For simple vertical subdivision. Offers security due to its wide base design, also when used with large cables or hoses.

	Slotted separator	
	unassembled	587
assembled	588	

Option 2 | Full-width shelves
Slotted separator

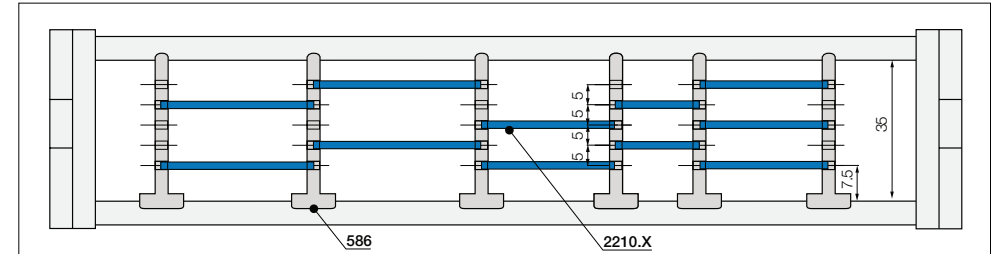
Vertical separation. The slot allows basic vertical and horizontal shelving arrangements.

	Full-width shelf for e-tubes	
	unassembled	220.X
assembled	221.X	

Full-width shelf

This option is for applications with many small cables with similar diameters. For full-width separation.

Full-width shelves Width = X [mm]	X [mm]		X [mm]		X [mm]			
	unassembled	assembled	unassembled	assembled	unassembled	assembled		
050	220.50	221.50	125	220.125	221.125	200	220.200	221.200
075	220.75	221.75	150	220.150	221.150			
100	220.100	221.100	175	220.175	221.175			



No lateral gap to side links necessary.
As standard separators are fitted every 2nd e-tube link!

	Slotted separator	
	unassembled	585
assembled	586	

Option 3 | Partial shelves
Slotted separator

Allows modular shelving arrangements.

	Shelf for e-tubes	
	unassembled	2200.X
assembled	2210.X	

Shelf

For applications involving many cables with different diameters, shelves can be fitted at different heights.

Shelves Width = X [mm]	X [mm]		X [mm]		X [mm]		X [mm]	
	unassembled	assembled	unassembled	assembled	unassembled	assembled	unassembled	assembled
018	2200.18	2210.18	043	2200.43	2210.43	088	2200.88	2210.88
023	2200.23	2210.23	048	2200.48	2210.48	099	2200.99	2210.99
028	2200.28	2210.28	058	2200.58	2210.58	124	2200.124	2210.124
033	2200.33	2210.33	068	2200.68	2210.68	149	2200.149	2210.149
038	2200.38	2210.38	073	2200.73	2210.73			

Protection against dirt and debris, small pitch for smooth motion

45



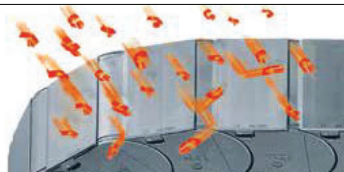
e-tubes | Series R68 | Lids removable along the outer radius

Part No. e-tubes	Bi [mm]	Ba [mm]	R Available bend radii										R68 [kg/m]
			100	125	150	175	200	225	250	300			
68.050.R.0	50	68	100	125	150	175	200	225	250	300	≈ 1.90		
68.075.R.0	75	93	100	125	150	175	200	225	250	300	≈ 2.18		
68.100.R.0	100	118	100	125	150	175	200	225	250	300	≈ 2.46		
68.115.R.0	115	133	100	125	150	175	200	225	250	300	≈ 2.63		
68.125.R.0	125	143	100	125	150	175	200	225	250	300	≈ 2.77		
68.150.R.0	150	168	100	125	150	175	200	225	250	300	≈ 3.05		
68.175.R.0	175	193	100	125	150	175	200	225	250	300	≈ 3.36		
68.200.R.0	200	218	100	125	150	175	200	225	250	300	≈ 3.64		
68.225.R.0	225	243	100	125	150	175	200	225	250	300	≈ 3.92		
68.250.R.0	250	268	100	125	150	175	200	225	250	300	≈ 4.23		

Complete Part No. with required radius (R). Example: 68.100.100.0

Hot swarf up to +850°C for e-tubes

- e-tubes can repel swarf up to +850°C. Special production option with the igus® material igumid HT
 - No hot swarf melting or embedding into the chain
- More information ► www.igus.eu/HT

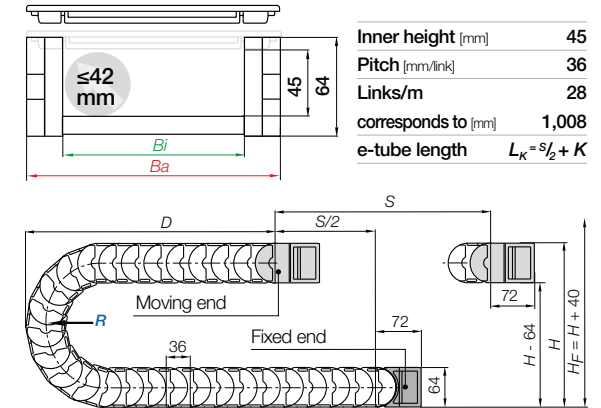
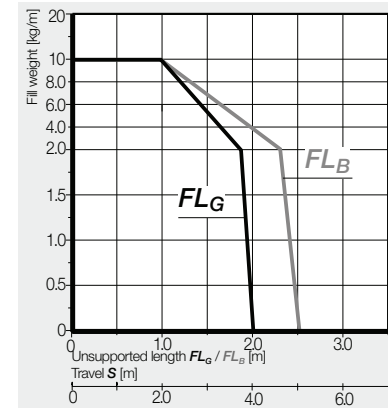


CFU strain relief with innovative honeycomb design

- Fast filling, openable from both sides for assembly in seconds
 - Flexible honeycomb design for increased holding force
 - Tribologically optimised honeycomb design for the best hold
 - Universal use, compact, space-saving design
- More information ► Page 1422



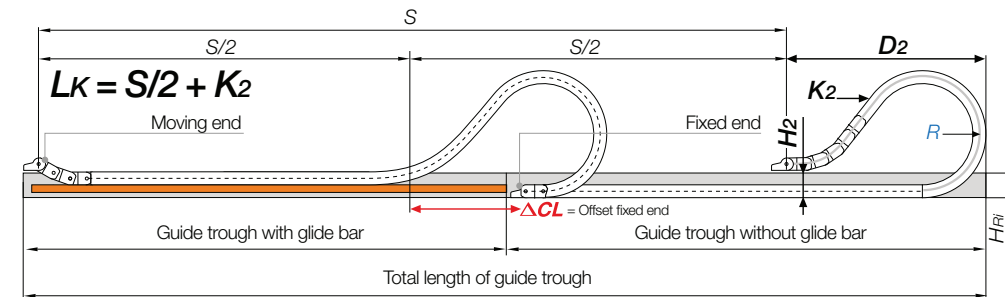
Unsupported applications | Short travels



R	100	125	150	175	200	225	250	300
H	264	314	364	414	464	514	564	664
D	186	211	236	261	286	311	336	386
K	390	465	545	625	705	780	860	1,015

The required clearance height: $H_F = H + 40\text{mm}$ (with 2.5kg/m fill weight)

Gliding applications | For travel lengths from 6m to max. 100m



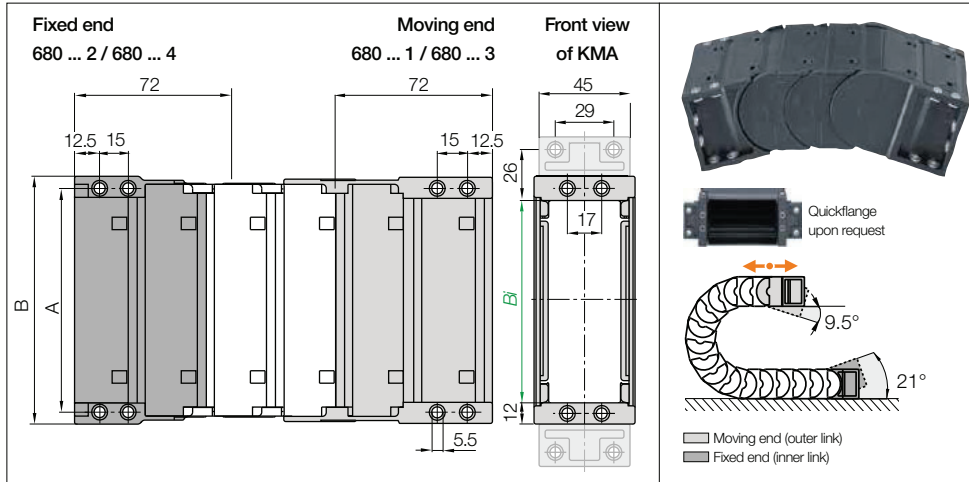
Note: We recommend the project planning of such a system to be carried out by igus®.

In case of travels between 4 and 6m we recommend an e-tube with a longer unsupported length.

If a gliding application is required for a long travel, please consult igus®.

R	100	125	150	175	200	225	250	300
H ₂	201	220	220	220	220	220	220	220
D ₂	200	370	440	540	650	700	850	1,050
K ₂	500	648	792	900	1,116	1,269	1,476	1,800
ΔACL	*	164	204	294	364	439	514	664

*Upon request



KMA pivoting | Recommended for unsupported applications
KMA locking | Recommended for vertical hanging and standing applications

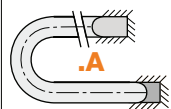
Width index	Part no. full set KMA pivoting	Part No. full set KMA locking	A [mm]	B [mm]	Bi [mm]
050. ▶	680.050.12	680.050.34	62	74	50
075. ▶	680.075.12	680.075.34	87	99	75
100. ▶	680.100.12	680.100.34	112	124	100
115. ▶	680.115.12	680.115.34	127	139	115
125. ▶	680.125.12	680.125.34	137	149	125
150. ▶	680.150.12	680.150.34	162	174	150
175. ▶	680.175.12	680.175.34	187	199	175
200. ▶	680.200.12	680.200.34	212	224	200
225. ▶	680.225.12	680.225.34	237	249	225
250. ▶	680.250.12	680.250.34	262	274	250

(KMA = polymer metal mounting bracket)

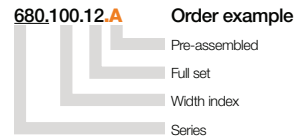
The following parts are required for attachment of the mounting brackets:

- Socket head cap bolt M5 DIN 912-8.8 Length depends on the thickness of the attachment base
- Washer 5.3 DIN 125-ST
- Hexagon nut M5 DIN 934-8

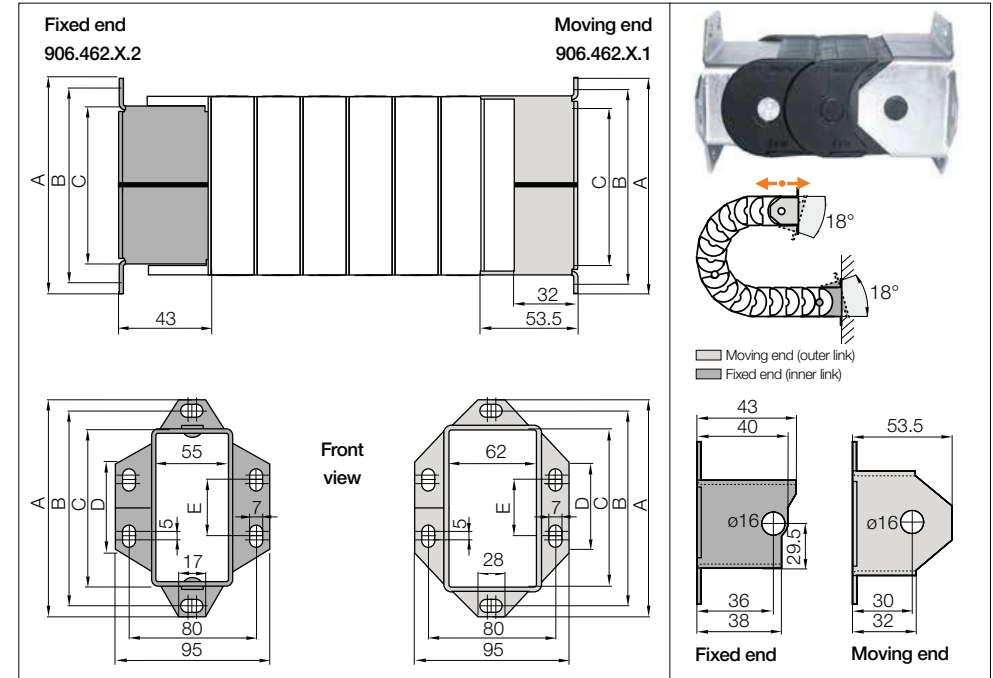
To receive full sets with pre-fitted quickflange please add index QF ▶ For example: Part No. 680.100.12.QF. Unassembled quickflange: Part No. 16800.QF



The bracket orientations are set automatically when using an igus® KMA mounting bracket with attachment from any side. To receive a KMA mounting bracket **pre-fitted** please add index **A**.



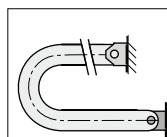
Strain relief e.g. clamps, tiwrap plates, nuggets and clips are available from stock. The complete chainfix range with ordering options ▶ From page 1392



Steel flange, pivoting | Recommended for unsupported applications

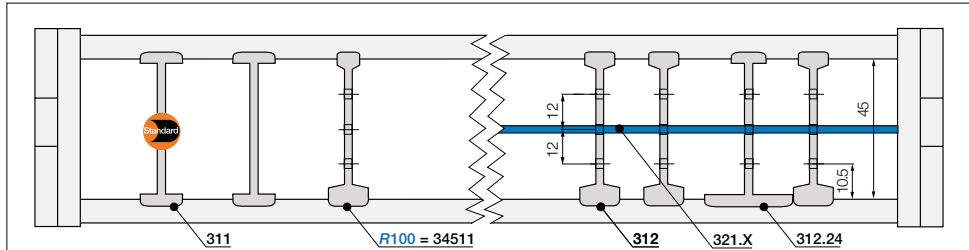
Width index	Hole pattern	Part No. Moving end	Bi [mm]	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]
075. ▶	68.1	906.462.1.1	75	116	104	83.3	50	30
115. ▶	68.2	906.462.2.1	115	156	144	123.3	90	50
175. ▶	68.3	906.462.3.1	175	216	204	183.3	150	100

Width index	Hole pattern	Part No. Fixed end	Bi [mm]	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]
075. ▶	68.1	906.462.1.2	75	116	104	83.4	38	30
115. ▶	68.2	906.462.2.2	115	156	144	123.4	78	50
175. ▶	68.3	906.462.3.2	175	216	204	183.4	138	100



Metallic flange brackets with common hole patterns can easily replace alternatives, without having to alter the hole pattern. Flush attachment possibilities at both ends of the e-tube using flange mounting brackets made of steel.

Strain relief e.g. clamps, tiwrap plates, nuggets and clips are available from stock. The complete chainfix range with ordering options ▶ From page 1392



No lateral gap to side links necessary.
As standard separators are fitted every 2nd e-tube link!

Standard separator

unassembled	301
assembled	311

Separator for radius R 100

unassembled	34501
assembled	34511

Option 1 | Separators
Standard separator

For simple vertical subdivision. Offers security due to its wide base design, also when used with large cables or hoses.

Not suitable for bend radius R 100!

Separator for radius R 100

If you select bend radius R 100 please use this separator for a vertical subdivision.

Slotted separator

unassembled	302
assembled	312

Standard separator, wide base

unassembled	302.24
assembled	312.24

Full-width shelf for e-tubes

unassembled	320.X
assembled	321.X

Option 2 | Full-width shelves
Slotted separator

Vertical separation. The slot allows basic vertical and horizontal shelving arrangements.

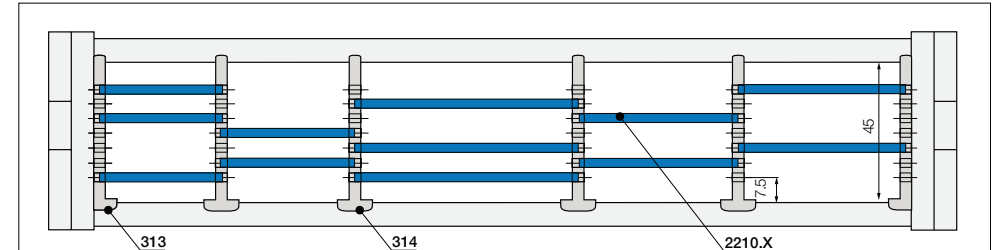
Slotted separator, wide base

If a wide space between the separators has to be kept or separators have to be fixed in their position.

Full-width shelf

This option is for applications with many small cables with similar diameters. For full-width separation.

Full-width shelves Width = X [mm]	X [mm]			X [mm]			X [mm]			
	unassembled	assembled		unassembled	assembled		unassembled	assembled		
050	320.050	321.050		150	320.150	321.150		250	320.250	321.250
075	320.075	321.075		175	320.175	321.175				
115	320.115	321.115		200	320.200	321.200				
125	320.125	321.125		225	320.225	321.225				



No lateral gap to side links necessary.
As standard separators are fitted every 2nd e-tube link!

Slotted separator

unassembled	304
assembled	314

Slotted side plate

unassembled	303
assembled	313

Shelf for e-tubes

unassembled	2200.X
assembled	2210.X

Option 3 | Partial shelves
Slotted separator

Allows modular shelving arrangements.

Slotted side plate

Allows modular shelving right up to the side links. No clearance required!

Shelf

For applications involving many cables with different diameters, shelves can be fitted at different heights.

Shelves Width = X [mm]	X [mm]			X [mm]			X [mm]		
	unassembled	assembled		unassembled	assembled		unassembled	assembled	
018	2200.18	2210.18		043	2200.43	2210.43	088	2200.88	2210.88
023	2200.23	2210.23		048	2200.48	2210.48	099	2200.99	2210.99
028	2200.28	2210.28		058	2200.58	2210.58	124	2200.124	2210.124
033	2200.33	2210.33		068	2200.68	2210.68	149	2200.149	2210.149
038	2200.38	2210.38		073	2200.73	2210.73			