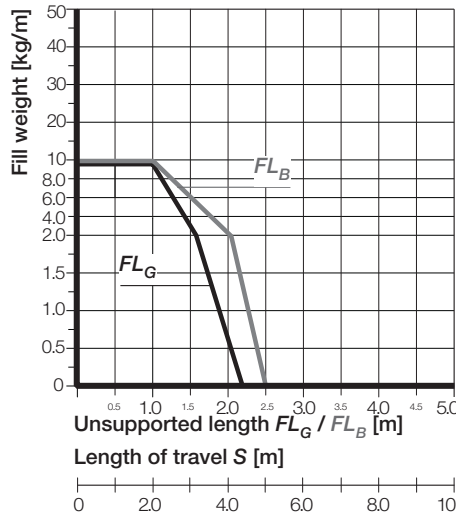
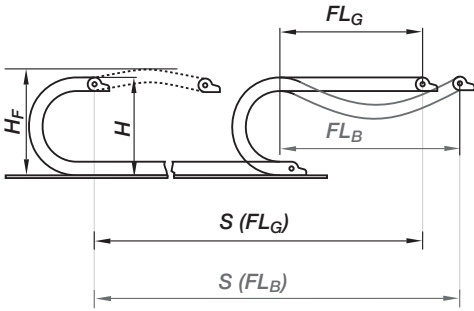
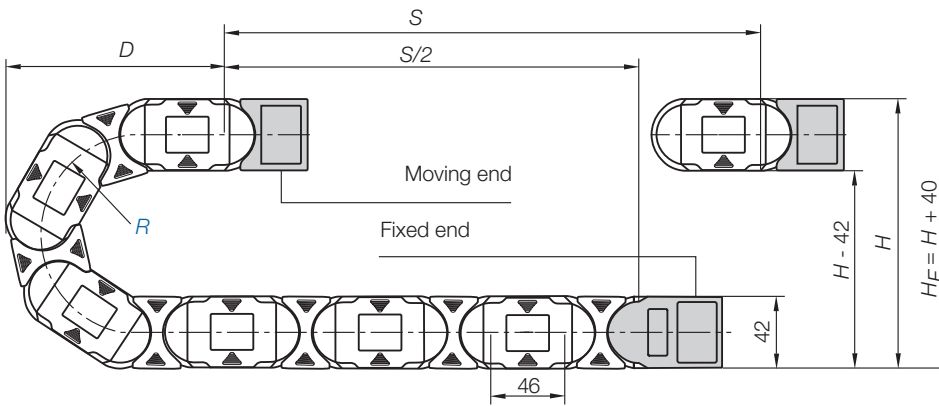


Unsupported length

FL_G = with straight upper run
 FL_B = with permitted sag
 Further information ► **Design, page 5.38**



- S = Length of travel
 - R = Bending radius
 - H = Nominal clearance height
 - H_F = Required clearance height
 - H_{RI} = Trough inner height
 - D = Overlength E-Chain® radius in final position
 - K = $\pi \cdot R$ + "safety"
 - D_2 = Over length - long travels, gliding
 - K_2 = *Further add-on
 - H_2 = *Mounting height
- *if the mounting bracket location is set lower

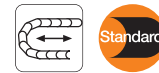


Pitch = 46 mm/link Links/m = 22 (1012 mm) Chain length = $S/2 + K$

R	055	063	075	100	125	150	175	200	250
H	152	168	192	242	292	342	392	442	542
D	122	130	142	167	192	217	242	267	317
K	265	290	330	410	485	565	655	725	880
H ₂	152	168	192	158	158	158	158	158	158
D ₂ ⁺²⁵	122	130	142	350	490	530	665	730	935
K ₂	265	290	330	598	782	920	1104	1242	1610

Other installation methods

- Vertical, hanging ≤ 80 m
- Vertical, standing ≤ 5 m
- Side mounted, un_supp. ≤ 2 m
- Rotary requires further calculation
- Unsupported length of upper run = upon request

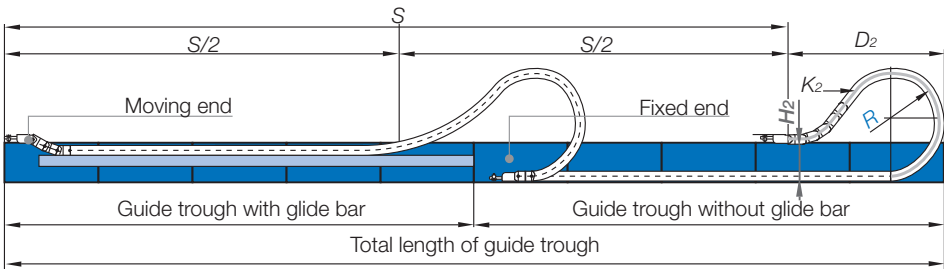


Short travels - unsupported

Unsupported E-Chains® feature positive camber over short travels. This must be accounted for when specifying the clearance height H_F . Please consult igus® if space is particularly restricted.

The required clearance height:
 $H_F = H + 40$ mm
 (with 1,0 kg/m fill weight)

Long travel lengths from 10 m to max. 200 m Chain length = $S/2 + K_2$



In case of travels between 4 and 10 m we recommend a longer unsupported length.



Gliding, long travel applications (max. 200 m)

In this case the E-Chain® upper run will be introduced in a guide trough on the lower run. We recommend to realize the engineering of such a plant by our technicians.

Speed / acceleration FL_G	max. 20 [m/s] / max. 200 [m/s ²]
Speed / acceleration FL_B	max. 3 [m/s] / max. 6 [m/s ²]
Gliding speed / acceleration (maximum)	max. 10 [m/s] / max. 50 [m/s ²]
Material - permitted temperature °C	igumid G / -40° up to +120° C
Flammability class, igumid G	VDE 0304 IIC UL94 HB

Technical Data



Details of material properties

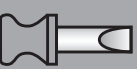
► page 5.64



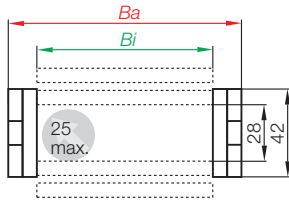
For support of the lower run - **Support Tray tool kit** available ► page 5.498

System E4.1
Inner height: 28 mm

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Fax +49- (0) 22 03-96 49-222



► 5.241

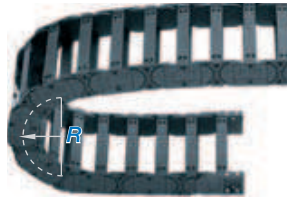


Part No. structure

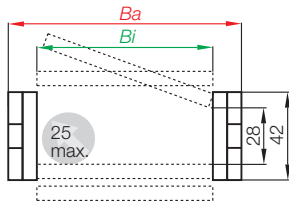
E4.28.300.250.0



Series E4.28 - E-Chain® with crossbars every link



- Robust solution with crossbars every link
- Can be opened from two sides
- Removable crossbars



Part No. structure

R4.28.300.250.0



Series R4.28 - Fully enclosed E-Tube



- Fully enclosed
- Excellent cable protection against dirt
- Protection against hot chips
- Lids along the entire inner radius are completely removable. Lids along the entire outer radius are single sided snap-open with a hinge on the other side to keep them attached to the chain or completely removable.



Low-noise! ...due to special rubber pads design

Series ES4.1 - Order example: ES4.28.100.250.0

Series RS4.1 - Order example: RS4.28.100.250.0

Further information:

www.igus.de or phone: +49-0 22 03-96 49-800



Part No.	<i>Bi</i> [mm]	<i>Ba</i> [mm]	E4.28 [kg/m]	R4.28 [kg/m]
E4.28.040..... <input type="text"/> .0	40	60	≈ 1,06	-
E4.28/R4.28.050. <input type="text"/> .0	50	70	≈ 1,11	≈ 2,20
E4.28.062..... <input type="text"/> .0	62	82	≈ 1,17	-
E4.28.070..... <input type="text"/> .0	70	90	≈ 1,20	-
E4.28/R4.28.075. <input type="text"/> .0	75	95	≈ 1,23	-
E4.28.087..... <input type="text"/> .0	87	107	≈ 1,28	-
E4.28/R4.28.100. <input type="text"/> .0	100	120	≈ 1,37	≈ 2,54
E4.28/R4.28.125. <input type="text"/> .0	125	145	≈ 1,51	≈ 2,78
E4.28/R4.28.150. <input type="text"/> .0	150	170	≈ 1,61	≈ 3,02
E4.28/R4.28.175. <input type="text"/> .0	175	195	≈ 1,71	≈ 3,26
E4.28/R4.28.200. <input type="text"/> .0	200	220	≈ 1,84	≈ 3,50
E4.28/R4.28.225. <input type="text"/> .0	225	245	≈ 1,99	≈ 3,82
E4.28/R4.28.250. <input type="text"/> .0	250	270	≈ 2,14	≈ 3,98
E4.28.275..... <input type="text"/> .0	275	295	≈ 2,27	-
E4.28/R4.28.300. <input type="text"/> .0	300	320	≈ 2,39	≈ 4,46

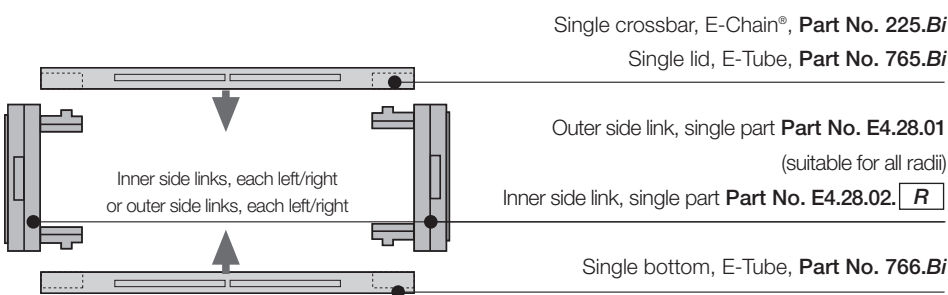
*not available for R4.28

Available bending radii

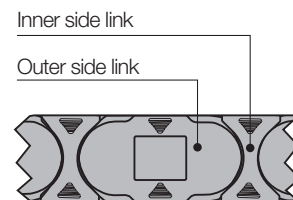
R [mm]

Supplement Part No. with required radius. Example: E4.28.300..0

0 = standard color, other colors ▶ page 5.65 · Pitch: 46 mm/link - Links/m = 22



Part No. E-Chain®
links, single parts



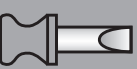
Hot Chips up to 850°C

E-Tubes that repel hot chips, up to 850°C - Some applications, depending on amount and size of the chips, left burn- and melt marks. That is no longer the case with the igus® "igumid HT" material.

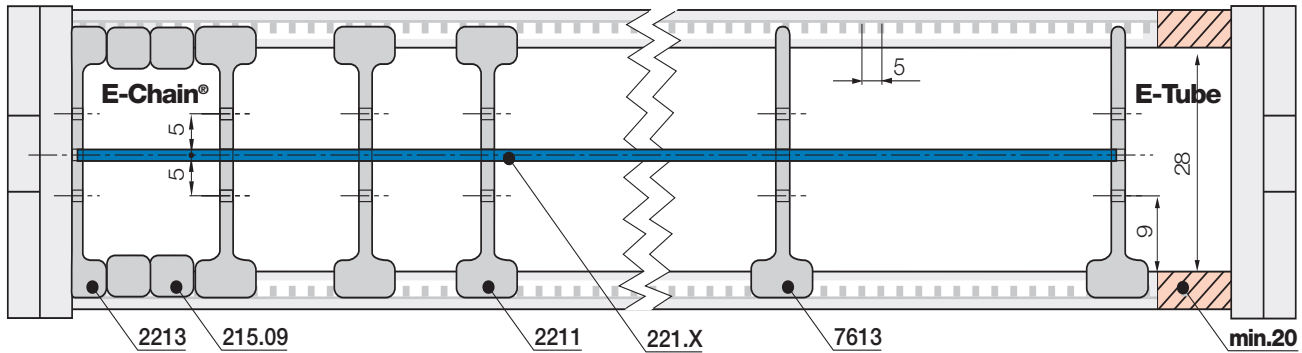
Further Information: www.igus.de/en/HT

System E4.1
Inner height: 28 mm

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Fax +49- (0) 22 03-96 49-222



Option 1 | Separators and spacers* (*side-mounted applications)



Note E-Tube: Please observe a lateral spacing of **20 mm** to the sidelinks!
In the standard configuration separators are assembled every 2nd E-Chain® link !

		<p>Separator for E-Chains®</p> <p>unassembled 2201</p> <p>assembled 2211</p>
		<p>Separator for E-Tubes</p> <p>unassembled 7603</p> <p>assembled 7613</p>
		<p>Spacer* for E-Chains®</p> <p>unassembled 205.09</p> <p>assembled 215.09</p>
		<p>Side plate for E-Chains®</p> <p>unassembled 2203</p> <p>assembled 2213</p>
		<p>Full-width shelf (40-200 mm)</p> <p>unassembled 220.X</p> <p>assembled 221.X</p>

Separator 2201 (E-Chains® only)

is used when vertical and horizontal separation is required. Due to its slot, it allows basic vertical/horizontal shelving arrangements.

Separator 7603 (E-Tubes only)

For E-Tubes R4.28.

Spacer* 205.09 (E-Chains® only)

Separators can be fixed in position by spacers. The available interior height is reduced by 2 mm per spacer (4 mm when spacers are fitted on both sides). To avoid this, the parts can also be installed from the outside on the opening crossbar. (not for long travel applications).

Side plate 2203 (E-Chains® only)

Works like separator. Allows modular shelving close to the side links.

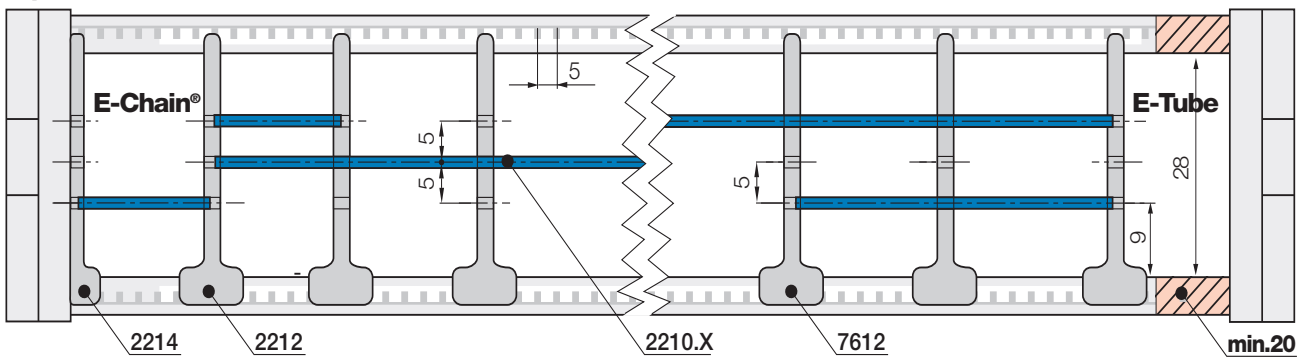
Full-width shelf 220.X

This option makes sense in applications with many thin cables with similar diameters. Full-width shelves can be arranged at 3 different heights (in 5 mm increments).

Full-width shelf

Width X [mm]	unassembled	assembled	Width X [mm]	unassembled	assembled	Width X [mm]	unassembled	assembled
040	220.40	221.40	075	220.75	221.75	150	220.150	221.150
050	220.50	221.50	087	220.87	221.87	175	220.175	221.175
062	220.62	221.62	100	220.100	221.100	200	220.200	221.200
070	220.70	221.70	125	220.125	221.125			

Option 2 | Shelves



Note E-Tube: Please observe a lateral spacing of 20 mm to the sidelinks!
In the standard configuration separators are assembled every 2nd E-Chain® link !

Middle plate for E-Chains®
unassembled **2202**
assembled **2212**

Middle plate 2202 (E-Chains® only)

To achieve a modular shelving by shelf 2220.X arranged at 3 different heights (in 5 mm increments).

Middle plate for E-Tubes
unassembled **7602**
assembled **7612**

Middle plate 7602 (E-Tubes only)

For E-Tubes R4.28.
A side plate is not available for the E-Tube.

Side plate for E-Chains®
unassembled **2204**
assembled **2214**

Side plate 2204 (E-Chains® only)

Works like middle plate.
Allows modular shelving close to the side links.

Shelf (18-149 mm)
unassembled **2220.X**
assembled **2210.X**

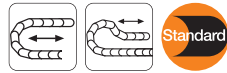
Shelf 2220.X

For horizontal separation. Shelves of various widths can be arranged at 3 different heights (in 5 mm increments).

Shelves

Width X [mm]	unassembled	assembled	Width X [mm]	unassembled	assembled	Width X [mm]	unassembled	assembled
018	2200.18	2210.18	043	2200.43	2210.43	088	2200.88	2210.088
023	2200.23	2210.23	048	2200.48	2210.48	099	2200.99	2210.099
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			



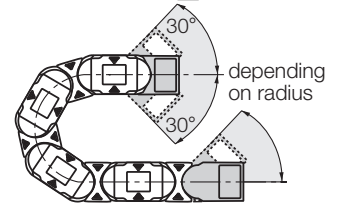


The Standard - Option KMA* - pivoting

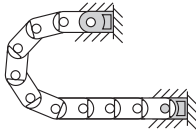
- Recommended for unsupported and gliding applications
- Universal mountable with attachment capability on all sides
- Bolted connection outside of chain cross-section
- Confined installation conditions
- Corrosion resistant

*KMA = Polymer Metal Mounting Bracket

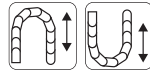
Moving end
E4.280/R4.280...□.2



Fixed end
E4.280/R4.280...□.1



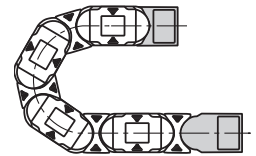
The attachment variants arising automatically by the choice of the KMA mounting bracket



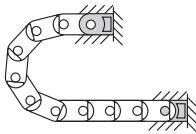
Option KMA - locking

- Recommended for vertical hanging / standing applications
- Additionally:**
- Universal mountable
 - Corrosion resistant
 - Locked connections
 - At very high acceleration

Moving end
E4.281/R4.281...□.2



Fixed end
E4.281/R4.281...□.1



The attachment variants arising automatically by the choice of the KMA mounting bracket

Dimensions and order configurations

Part No. structure (pivoting)

E4.280.
R4.280. 040. 2. 12

Full set
odd/even
Width
E4.280 = E-Chain®
R4.280 = E-Tube

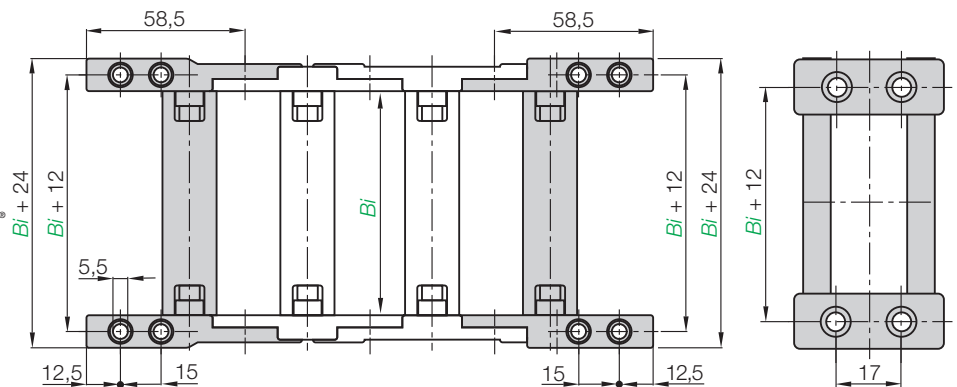
Part No. structure (locking)

E4.281.
R4.281. 040. 2. 12

Full set
odd/even
Width
E4.281 = E-Chain®
R4.281 = E-Tube

Fixed end
E4.280/R4.280apivoting)
E4.281/R4.281...□.1 (locking)

Moving end
(pivoting) E4.280/R4.280...□.2
(locking) E4.281/R4.281...□.2



Width index	Part No. full set pivoting	Part No. full set locking	Bi [mm]	Width index	Part No. full set pivoting	Part No. full set locking	Bi [mm]
.040.	E4.280	E4.281 .040.□.12	40	.150.	E4./R4.280	E4./R4.281 .150.□.12	150
.050.	E4./R4.280	E4./R4.281 .050.□.12	50	.175.	E4./R4.280	E4./R4.281 .175.□.12	175
.062.	E4.280	E4.281 .062.□.12	62	.200.	E4./R4.280	E4./R4.281 .200.□.12	200
.070.	E4.280	E4.281 .070.□.12	70	.225.	E4./R4.280	E4./R4.281 .225.□.12	225
.075.	E4./R4.280	E4./R4.281 .075.□.12	75	.250.	E4./R4.280	E4./R4.281 .250.□.12	250
.087.	E4.280	E4.281 .087.□.12	87	.275.	E4.280	E4.281 .275.□.12	275
.100.	E4./R4.280	E4./R4.281 .100.□.12	100	.300.	E4./R4.280	E4./R4.281 .300.□.12	300
.125.	E4./R4.280	E4./R4.281 .125.□.12	125				

Please insert **1** for odd number of links or **2** for even number of links

Full set, for both ends:

E4.280,040. 2. 12 (even)

Single-part order:

E4.280,040. 2. 2 (even)

Mounting bracket moving end

E4.280,040. 2. 1 (even)

Mounting bracket fixed end

E4.1 | Series E4.28 | Accessories | Strain Relief



Strain relief tie-wrap plate Part No. 2050.Z can be fixed on the last crossbar.

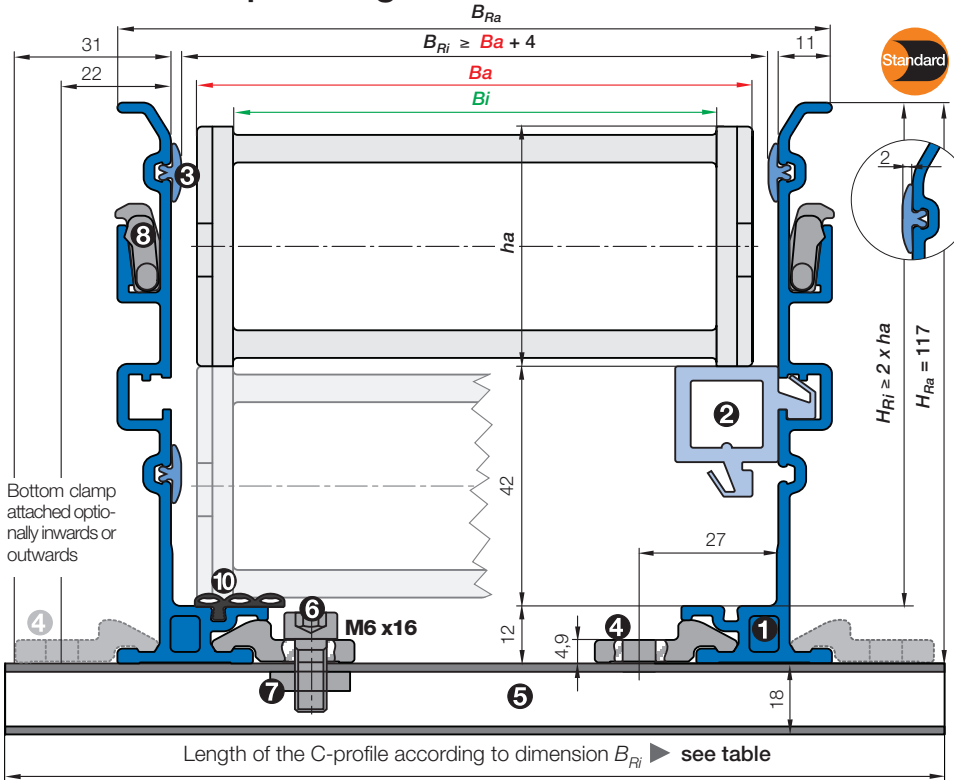
Part. No.	Width [mm]	Number of teeth
2050.Z	60	6



Aluminum "SuperTrough" | Basic Version



E4.28
R4.28



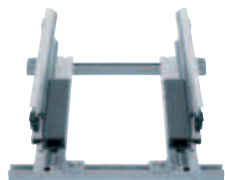
- B_a = Outer width E-Chains® / E-Tube
- B_i = Inner width E-Chains® / E-Tube
- h_a = Outer height E-Chains® / E-Tube
- H_{Ri} = Inner trough height
- H_{Ra} = Outer trough height
- B_{Ri} = Inner trough width ▶ depends on dim. B_a
- B_{Ra} = Outer trough width
- n_{Mon} = Number of installation sets (left/right)
- n_{Ri} = Number of trough sets (left/right)
- ! $H_{Ri} \geq 2 \cdot h_a$
- ! $B_{Ri} \geq B_a + 4$
- = Guide trough set ● = Glide bar
- = Installation set "Basic" ● = C-Profile

Installation set "Basic" with C-Profile

Bottom Clamp attached optionally inwards or outwards

E4.28.070.250.0 ▶ Order example

	B_{Ri} [mm]	Part No.	Part No.
		attached inwards	attached outwards
.040	64	-	960.30.175
.050	74	960.30.125	960.30.175
.062	86	960.30.150	960.30.200
.070	94	960.30.150	960.30.200
.075	99	960.30.150	960.30.200
.087	111	960.30.175	960.30.225
.100	124	960.30.175	960.30.225
.125	149	960.30.200	960.30.250
.150	174	960.30.225	960.30.275
.175	199	960.30.250	960.30.300
.200	224	960.30.275	960.30.325
.225	249	960.30.300	960.30.350
.250	274	960.30.325	960.30.375
.275	299	960.30.350	960.30.400
.300	324	960.30.375	960.30.425

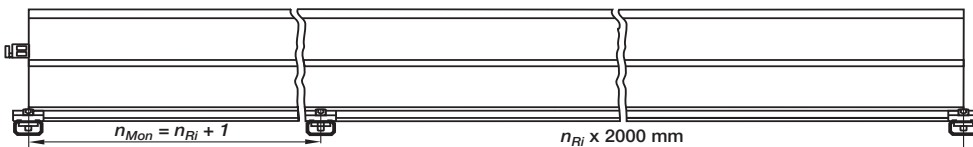


- **Components, trough "Basic":** 1 Trough side parts, aluminum, 2 m 2 Glide bar, plastic, 2 m 3 Glide strips, plastic, 2 m (without glide strips on request) 10 Optional: Silencer profile, rubber
- **Components, installation set "Basic":** 4 Bottom clamp, aluminum 5 C-profile, steel galvanized 6 Screw M6 x16 7 Sliding nut M6 8 Interface connector, plastic

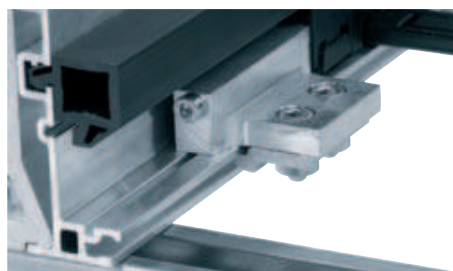


Order example: Length of travel 30 m - Center mounted for Series E4.28.070.250.0 with $B_{Ri} = 94$

- Guide trough set (set of 2 trough side parts, incl. glide strips) **without** glide bar
Order text: 16 m guide trough without glide bar (8 x 2 m sections) Part No. 972.02.30.SL
- Guide trough set (set of 2 trough side parts, incl. glide strips) **with** glide bar
Order text: 16 m guide trough with glide bar (8 x 2 m sections) Part No. 972.02.31.SL
- Installation set "Basic" complete (guide trough-sets + 1)
Order text: 17 installation sets "Basic" Part No. 960.30.150
- Module for the fixed end
Order text: 1 set Part No. 972.82
- Option: For an additional noise dampening with dampening profile, please add Index A Example: Part No. 972.02.30.SLA



Principle sketch: Number of installation sets to be installed = Number of trough sections + 1

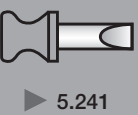


A quick fix for mounting the stationary end of an E-Chain®

With this module for the fixed end, fast and easy mounting onto the Aluminum "SuperTrough" is now possible without any drilling. Fast mounting of the E-Chain® by clamping onto the aluminum trough

- Quick relocation of the stationary end
- No drilling necessary

Insert for the installation set "Heavy-Duty": **972.50.XXX** instead of (960.30.XXX) on the right column "attached outwards"



For your online order, more products variety and configuration also use
▶ www.igus.de/en/E4.28 ▶ www.igus.de/en/R4.28

5.255

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Fax +49- (0) 22 03-96 49-222