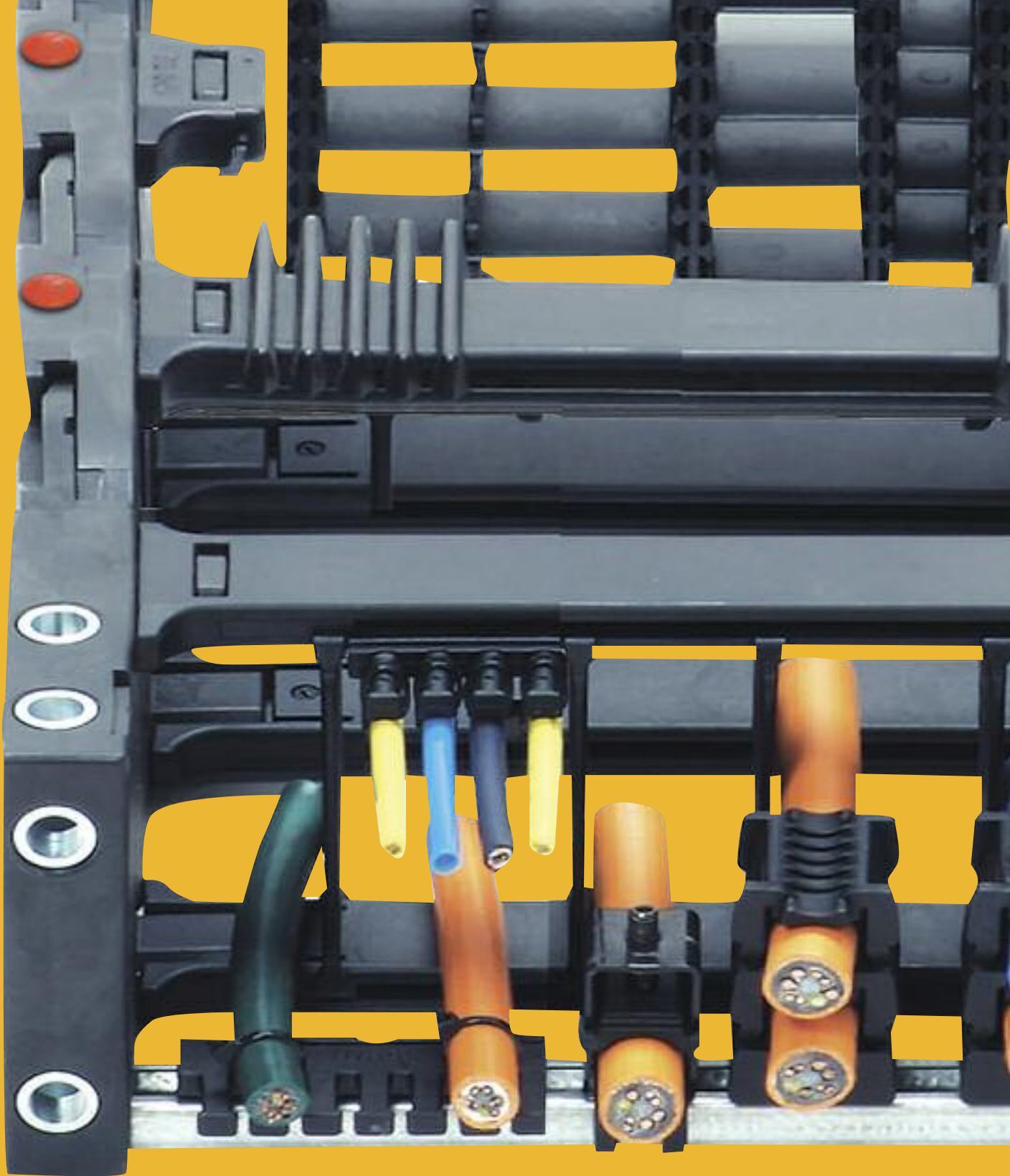
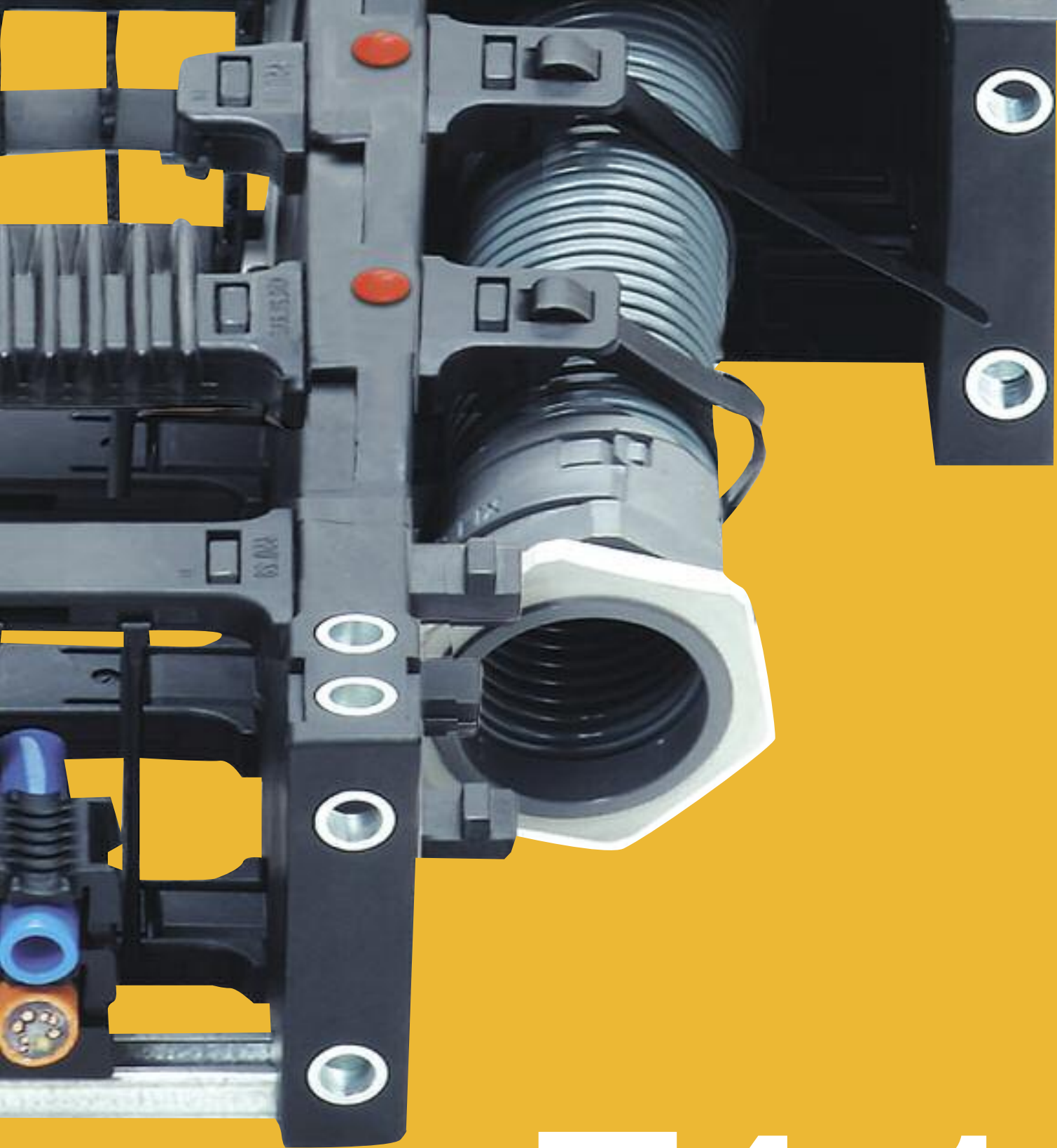






E4-1

E4-1 Energy Chain® series for almost all applications

The E4-1 system combines all the advantages of its three predecessors:

- Tongue and groove design provides greater lateral stability, high shear force on long travels and for longer unsupported lengths
- Ideal for side-mounted applications
- Noise dampening "brakes" and rubber dampers available
- Snap-open links for quick assembly, with or without pretension
- Dirt repellant and wear-resistant
- Side wear pads

Almost all accessories and mounting dimensions are identical. With the E4-1, the service life of your application can be still increased with lower costs.

Typical industries and applications

- Crane
- Indoor crane
- Composting plants
- Sewage plants
- Machine tools
- General mechanical engineering
- Material handling technology
- Refrigeration engineering
- Construction machinery
- Wood working
- Robotics and handling systems



Cleanroom test upon request



Reduced noise due to special rubber pads and special stop dog design



ESD classification: Electrically conductive ESD/ATEX version upon request



System E4-1 field proven in long travels



Fully enclosed Energy Tubes available as special design with HT material for 1562°F hot chips



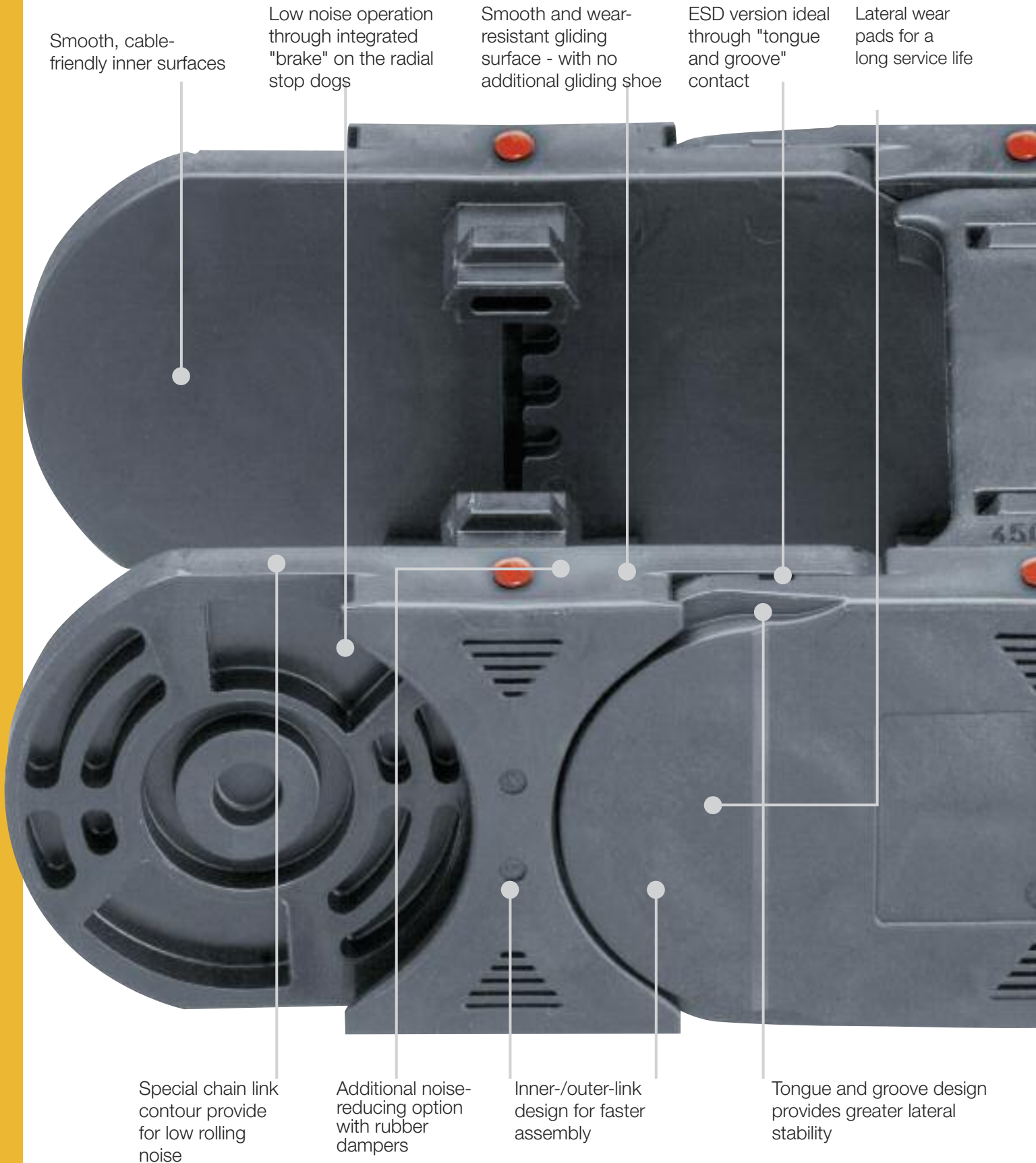


The E4-42 series in a machine tool, completely assembled with igus® Chainflex^a cables

Application	Design feature
Long unsupported length	Special stop dogs, tongue and groove link design
Low-noise operation, unsupported gliding	Integrated "brake", smooth gliding surfaces - rubber dampers optional
Hanging and standing installation	Torsional stability through tongue and groove link design, "no camber" option by flipping the outer link
Long travels	High push/pull forces through tongue and groove link design and stop dogs, large and smooth gliding surfaces
Side-mounted, unsupported	Tongue and groove link design increases unsupported length by about 30% mounted on the side
Fast assembly	"Inner link/outer link" design
Rotary motion	Through simple flipping of links or easy modification, gliding surfaces on the side
Increase service life of cable	Smooth, wide solid polymer support for cables, many quick-mounting shelving options
Increase service life of chains	Large pins, optimized material, high stability
ESD, ATEX	Tongue and groove link design for secure contact surfaces in motion (special version in conductive material)
Operation under dirt, chips, humidity	Tongue and groove link design design prevents chain breakage, dirt-resistant design

E4-1 Design Features

The E4-1 Series combines the tongue and groove link design and the inner and outer link design of previous E4 constructions — all in one Energy Chain®



Stable crossbars
with double locking

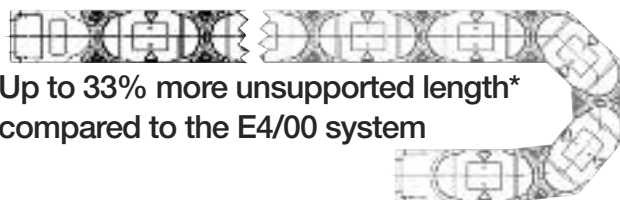
Types "with" or "without
camber" by flipping
outer links



Cable-friendly,
rounded
crossbar

Vertical stop dog
system for larger
unsupported lengths

Cut costs by eliminating additional components with E4-1 Energy Chains® - Proven durability and stability



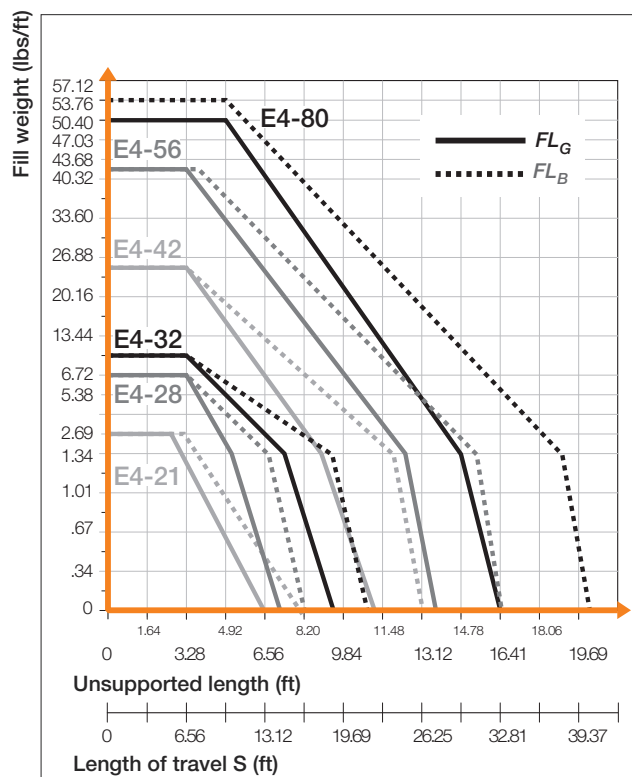
- Up to 133% higher tensile strength*
- Up to 33% more unsupported length*. Save in the purchase cost, as you can now use smaller Energy Chains®
- Due to the large unsupported lengths or loads, oversized energy supply systems can be optimized with the igus® E4-1 system

* Compared to the igus® E4/00 system series

** Test at igus® laboratory: Sag tested with defined weight and length over 96h

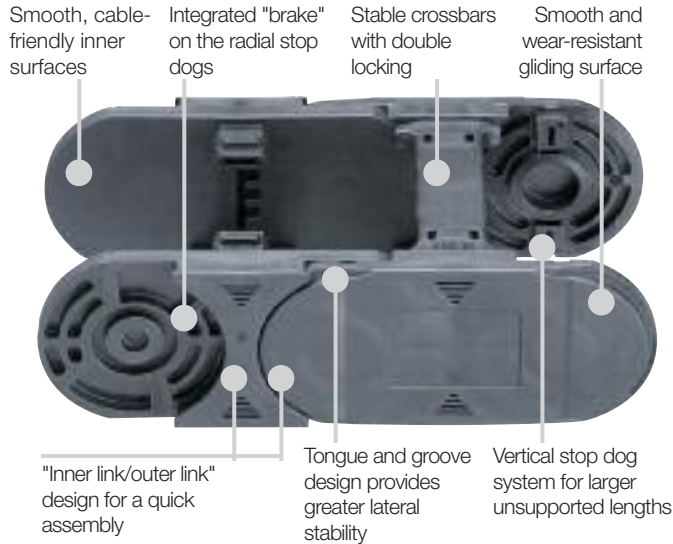
Selection table and assembly instructions

► page 8



E4-1 Design Features

energy chain® configurator 



- Available in 40 width sizes in both Energy Chain® and Energy Tube
- Interlocking side links for optimum lateral stability, for high push/pull force on long travels
- Long unsupported lengths
- "Brake" and rubber dampers as additional noise-reducing options
- Inner link/outer link design for quick assembly with various interior separation options
- Double locking stable crossbars that open from both sides
- Support Tray tool kit for the support of the lower run
- **Chapter 9, main catalog**
- Find more technical data about the material, chemical resistance, temperatures ➤ **Chapter 1, main catalog**

Crossbars every link for particularly demanding applications



Series	Inner height <i>hi</i> in. (mm)	Inner width <i>Bi</i> in. (mm)	Outer width <i>Ba</i> in. (mm)	Outer height <i>ha</i> in. (mm)	Bending radius <i>R</i> in. (mm)
E4-21	.82 (21)	1.18-4.72 (30-120)	1.73-5.28 (44-134)	1.10 (28)	1.50-7.87 (38-200)
E4-28	1.10 (28)	1.57-11.81 (40-300)	2.36-12.60 (60-320)	1.65 (42)	2.16-9.84 (55-250)
E4-32	1.26 (32)	1.97-15.75 (50-400)	2.87-16.65 (73-423)	2.13 (54)	2.48-11.81 (63-300)
E4-42	1.65 (42)	1.97-15.75 (50-400)	2.99-16.77 (76-426)	2.52 (64)	2.95-13.78 (75-350)
E4-56	2.20 (56)	1.97-23.62 (50-600)	3.31-24.96 (84-634)	3.31 (84)	5.31-19.69 (135-500)
E4-80	3.15 (80)	1.97-23.62 (50-600)	3.94-25.59 (100-650)	4.25 (108)	5.91-39.37 (150-1000)

Crossbars every 2nd link for almost all applications



Series	Inner height <i>hi</i> in. (mm)	Inner width <i>Bi</i> in. (mm)	Outer width <i>Ba</i> in. (mm)	Outer height <i>ha</i> in. (mm)	Bending radius <i>R</i> in. (mm)
H4-32	1.26 (32)	1.97-15.75 (50-400)	2.87-16.65 (73-423)	2.13 (54)	2.48-11.81 (63-300)
H4-42	1.65 (42)	1.97-15.75 (50-400)	2.99-16.77 (76-426)	2.52 (64)	2.95-13.78 (75-350)
H4-56	2.20 (56)	1.97-23.62 (50-600)	3.31-24.96 (84-634)	3.31 (84)	5.31-19.69 (135-500)
H4-80	3.15 (80)	1.97-23.62 (50-600)	3.94-25.59 (100-650)	4.25 (108)	5.91-39.37 (150-1000)

Energy Tubes fully enclosed, for complete cable protection



Series	Inner height <i>hi</i> in. (mm)	Inner width <i>Bi</i> in. (mm)	Outer width <i>Ba</i> in. (mm)	Outer height <i>ha</i> in. (mm)	Bending radius <i>R</i> in. (mm)
R4-28	1.10 (28)	1.97-11.81 (50-300)	2.76-12.60 (70-320)	1.65 (42)	2.95-9.84 (75-250)
R4-32	1.26 (32)	1.97-11.81 (50-300)	2.87-12.72 (73-323)	2.13 (54)	4.92-11.81 (125-300)
R4-42	1.65 (42)	1.97-11.81 (50-300)	2.99-12.83 (76-326)	2.52 (64)	4.92-13.78 (125-350)
R4-56	2.20 (56)	2.95-18.19 (75-462)	4.29-19.57 (109-497)	3.31 (84)	5.91-19.69 (150-500)
R4-80	3.15 (80)	7.87-15.75 (200-400)	9.84-15.75 (250-450)	4.25 (108)	7.87-39.37 (200-1000)

Energy Chain system® E4-1

Assembly instructions

Energy Chains® - Opening



1 Remove crossbars - Insert screwdriver into the slot, using a lever action, apply pressure to the screwdriver to remove the crossbar.



2 Remove clips - Insert screwdriver into the slot, using a lever action, apply pressure to the screwdriver to remove the clip

Energy Tube - Opening



1 Remove lids/bottoms - Insert screwdriver into the slot, using a lever action apply pressure to the screwdriver to release



2 Release only **one side** to open the lid

Energy Chains® and Energy Tubes - Assembling



1 Line up two inner side links side by side. Attach an outer side link between



2 Assemble crossbars - push down and snap in using a screwdriver



3 Assemble clips (for Energy Chains with crossbars every other link) - push down and snap in using a screwdriver



4 Assemble Energy Tube lids and bottoms - Attach to the connector at an angle and snap in place

Energy Chains® and Energy Tubes - Separating



1 Remove crossbars, clips, lids and bottoms at the outer links



2 Insert screwdriver into the slot between the side links. Using a lever action, release the side links



3 Remove the outer links



4 Separate the Energy Chain®

Price Index



Series E4-21

Special Options Available



Low noise version available
with special rubber pads



Cleanroom test upon request



ESD classification:
Electrically conductive
ESD/ATEX version upon request

Assembly Tips



Opening Energy Chains®: Remove cross-bars and clips - Insert screwdriver into the slot, push down, release by lever action

Other Installation Methods

Vertical, hanging ≤ 131 ft (40 m)

Vertical, standing ≤ 9.84 ft (3 m)

Side-mounted, unsupp. ≤ 3.28 ft (1 m)

Rotary requires further calculation

Usage Guidelines



- If quiet operation is required
- If very high speeds and/or accelerations are required
- Long travels
- High fill weights



- When an economic one-sided snap-open Energy Chain/tube is required
➤ **Series 1400/1450/1480/1500**
- When a one-sided snap-open Energy Tube is required at a low price
➤ **Series R117/R118**

Features & Benefits

- 1 Strain relief with strain relief separators in the mounting bracket are available
- 2 Straight run through inner-/outer-link design
- 3 Interior separation with standard locking separator
- 4 The tongue and groove design provides greater lateral stability
- 5 15% more tensile strength (compared to the older E4 series), better unsupported length through improved stop dog system and vertical radial stops
- 6 Mounting brackets pivoting on one side with all-round attachment option
- 7 Crossbars are removable along both radii
- 8 Smooth outline, dirt repellent
- 9 Wide, rounded plastic crossbars - cable friendly
- 10 Low-noise operation through integrated brake in the radial stop dog system
- 11 Optimized glide pads - long service life
- 12 Energy Chains® also available with reverse bending radius "RBR"



Order Example: Complete Energy Chain®

Please indicate chain length or number of links. Example:

6.56 ft (2 m) **E4-21-120-100-0**

With 2 separators **T2112** assembled every 2nd link

1 Set **E4-210-120-12**



Energy Chain®



Interior Separation



Mounting Bracket

Energy Chain system® E4-1

Series E4-21

Installation Dimensions

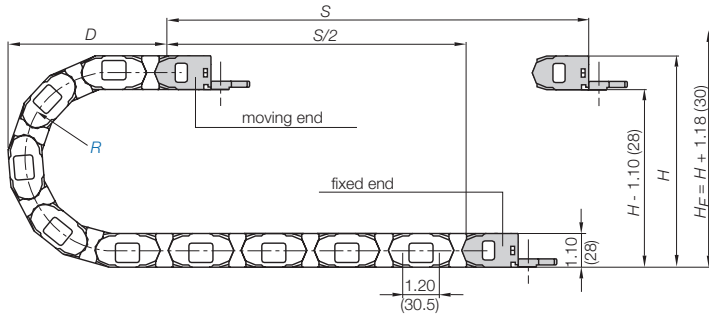
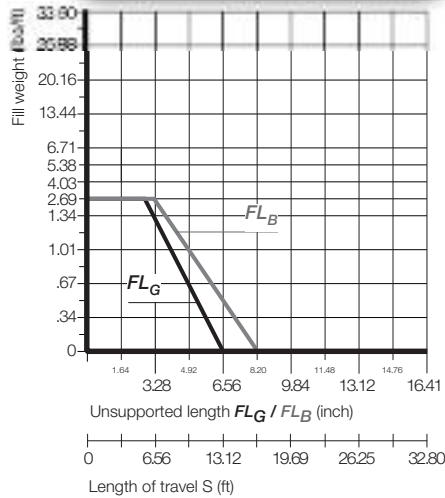
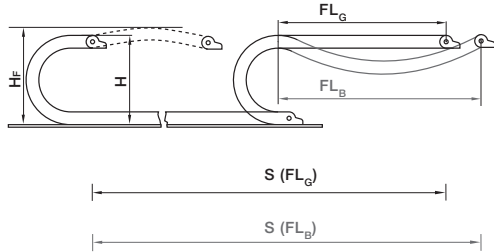
energy chain® configurator

igus®

E4-21

Short travel, unsupported length

- FL_B = unsupported with permitted sag
 - FL_G = unsupported with straight upper run
- Further information ► Design, Chapter 1, main catalog



The required clearance height: $H_F = H + 1.18$ in. (30 mm) (with 1.01 lbs/ft (1.5 kg/m) fill weight). Please consult igus® if space is particularly restricted.

R	1.50 (038)	1.89 (048)	2.48 (063)	2.95 (075)	3.94 (100)	5.91 (150)	7.87 (200)
H	4.09 (104)	4.88 (124)	6.06 (154)	7.01 (178)	8.98 (228)	12.91 (328)	16.85 (428)
D	3.35 (085)	3.74 (095)	4.33 (110)	4.72 (120)	5.71 (145)	7.68 (195)	9.65 (245)
K	7.28 (185)	8.46 (215)	10.24 (260)	11.81 (300)	14.96 (380)	21.06 (535)	27.17 (690)

Pitch per link: = 1.20" (30.5 mm)
Links per ft (m): = 10.06 (33)
For center mount applications:
Chain length = $\frac{S}{2} + K$

Short Travels - Unsupported

Unsupported Energy Chains® feature positive camber over short travels. This must be accounted for when specifying the clearance height. Please refer to **Installation dimensions** for further details.

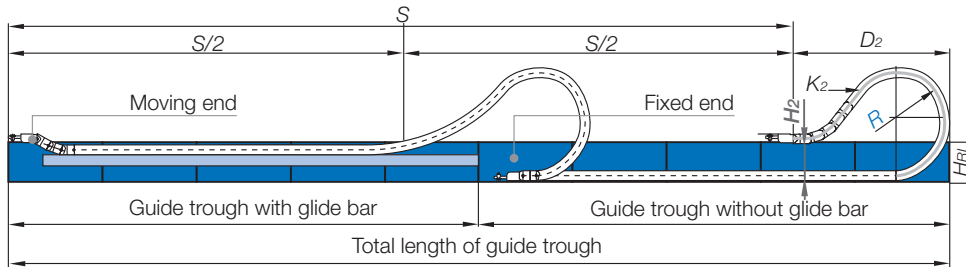
Legend

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

For long travels with lowered mounting height

Long travel lengths from 32.8 ft.(10m) to max. 394 ft. (120m)

For center mount applications:
Chain length: = $\frac{S}{2} + K_2$



R	1.50 (038)	1.89 (048)	2.48 (063)	2.95 (075)	3.94 (100)	5.91 (150)	7.87 (200)
H_2	-	-	-	-	5.31 (135)	5.31 (135)	5.31 (135)
D_{2+25}	-	-	-	-	19.29 (490)	20.87 (530)	26.18 (665)
K_2	-	-	-	-	30.79 (782)	36.22 (920)	43.46 (1104)



For support of the lower run, see Chapter 9 of the main catalog for the **Support Tray tool kit**

Long Travels - Gliding



If the unsupported length is exceeded, the Energy Chain®/Tube must glide on itself. This requires a guide trough.

Design, Chapter 1 main catalog

Technical Data



Details of material properties

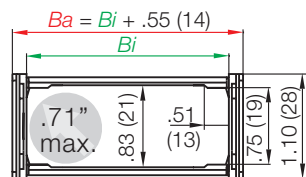
► Chapter 1
main catalog

Speed / acceleration FL_G	max. 65.6 ft/s (20 m/s) / max. 656 ft/s² (200 m/s²)
Speed / acceleration FL_B	max. 9.84 ft/s (3 m/s) / max. 19.69 ft/s² (6 m/s²)
Gliding speed / acceleration (maximum)	max. 32.8 ft/s (10 m/s) / max. 164 ft/s² (50 m/s²)
Material - permitted temperature	igumid G / -40°F (-40°C) up to +248°F (+120°C)
Flammability Class, igumid G	VDE 0304 IIC UL94 HB

PDF: www.igus.com/e-chain-pdfs
Specs/CAD/RFQ: www.igus.com/e-chains
RoHS info: www.igus.com/RoHS



Series E4-21 - Energy Chain® with crossbars every link



- Crossbars every link
- Removable crossbars
- Separator for locking crossbar (fixable) Standard
- Can be opened from both sides

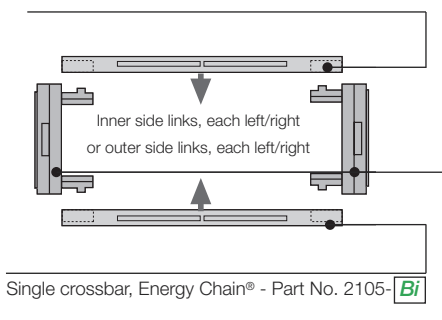
Part Number Structure

E4-21 120-100-0

Color - Black
Bending radius
Width
Series

Energy Chain® as separate parts, links and side plates

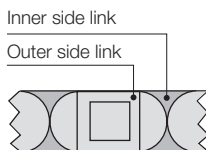
Single crossbar, Energy Chain® - Part No. 2105-**Bi**



Single crossbar, Energy Chain® - Part No. 2105-**Bi**

Outer side link, single part - Part No. 210-01
(Suitable for all radii)

Inner side link, single part - Part No. 210-02-**R**



Supplement part number with required radius. Example: E4-21-120-**100**-0

Pitch: 1.20 in. (30.5 mm) per link links/ft(m) = 10.06 (33)

Part Number.

Snap-open inner radius	Bi in. (mm)	Ba in. (mm)	Weight lbs/ft (kg/m)
E4-21-030- -0	1.18 (30)	1.73 (44)	≈ 0.40 (0.60)
E4-21-040- -0	1.57 (40)	2.13 (54)	≈ 0.43 (0.64)
E4-21-050- -0	1.97 (50)	2.52 (64)	≈ 0.45 (0.67)
E4-21-060- -0	2.36 (60)	2.91 (74)	≈ 0.48 (0.71)
E4-21-070- -0	2.76 (70)	3.31 (84)	≈ 0.50 (0.74)
E4-21-080- -0	3.15 (80)	3.70 (94)	≈ 0.52 (0.78)
E4-21-090- -0	3.54 (90)	4.09 (104)	≈ 0.55 (0.82)
E4-21-100- -0	3.94 (100)	4.49 (114)	≈ 0.57 (0.85)
E4-21-110- -0	4.33 (110)	4.88 (124)	≈ 0.60 (0.89)
E4-21-120- -0	4.72 (120)	5.28 (134)	≈ 0.62 (0.92)

Choose from the radii below for all of the above sizes

Radius (mm) Example: E4-21-120-**100**-0

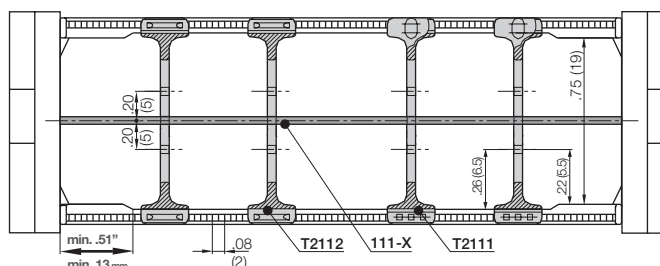
	038	048	063	075	100	150	200
R	1.50 (038)	1.89 (048)	2.48 (063)	2.95 (075)	3.94 (100)	5.91 (150)	7.87 (200)
H	4.09 (104)	4.88 (124)	6.06 (154)	7.01 (178)	8.98 (228)	12.91 (328)	16.85 (428)
D	3.35 (085)	3.74 (095)	4.33 (110)	4.72 (120)	5.71 (145)	7.68 (195)	9.65 (245)
K	7.28 (185)	8.46 (215)	10.24 (260)	11.81 (300)	14.96 (380)	21.06 (535)	27.17 (690)



Vertical separators and shelves

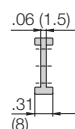
Energy Chains® and can be subdivided both vertically and horizontally using the various interior separation elements.

► **Design, Chapter 1** of the main catalog for layout recommendations.



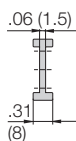
- Vertical separator T2102

This component is used when vertical and horizontal separation is required. Due to the slotted design it allows vertical/horizontal shelving arrangements



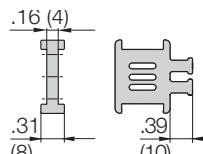
- Notched vertical separator T2101

This component can be locked in 2mm increments due to spaces in the crossbar preventing the separator from sliding sideways



- Strain relief separator T2103-Z

This separator can be integrated into the mounting bracket and can be placed at any point. It combines strain relief and interior separation.



Slotted Vertical Separator

Unassembled	Part No. T2102
Assembled	Part No. T2112

Slotted Vertical
separator
T2102



Vertical Separator

Unassembled	Part No. T2101
Assembled	Part No. T2111

Slotted notched
separator
T2101



Separators w/Integrated Shelf

Unassembled	Part No. T2103-Z
Assembled	Part No. T2113-Z

Strain relief
separator
T2103-Z

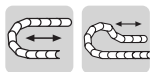


Width X		Usable Width		Part No.	Part No.
in.	(mm)	in.	(mm)	Unassembled	Assembled
1.18	(030)	.87	(22)	110-30	111-30
1.57	(040)	1.26	(32)	110-40	111-40
1.97	(050)	1.65	(42)	110-50	111-50
2.36	(060)	2.05	(52)	110-60	111-60
2.76	(070)	2.44	(62)	110-70	111-70
3.15	(080)	2.83	(72)	110-80	111-80
3.54	(090)	3.23	(82)	110-90	111-90
3.94	(100)	3.62	(92)	110-100	111-100
4.33	(110)	4.02	(102)	110-110	111-110
4.72	(120)	4.41	(112)	110-120	111-120

Shelves 110-XX

These components form the basic pattern of a shelf system. Shelves of various widths can be arranged at 3 different heights in .20" (5mm) increments.

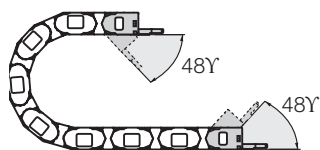
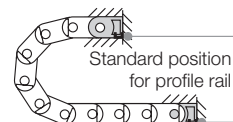




Standard

Option: pivoting

- Recommended for unsupported and gliding applications
- KMA mounting bracket with attachment points on all sides
- Well suited for tight installation conditions
- Integrated strain relief possible

Moving end
E4-210...-2Fixed end
E4-210...-1**Part Number Structure**

E4-210-030-12

Full Set

Width

Series

Full set, for both ends:

E4-210-030-12

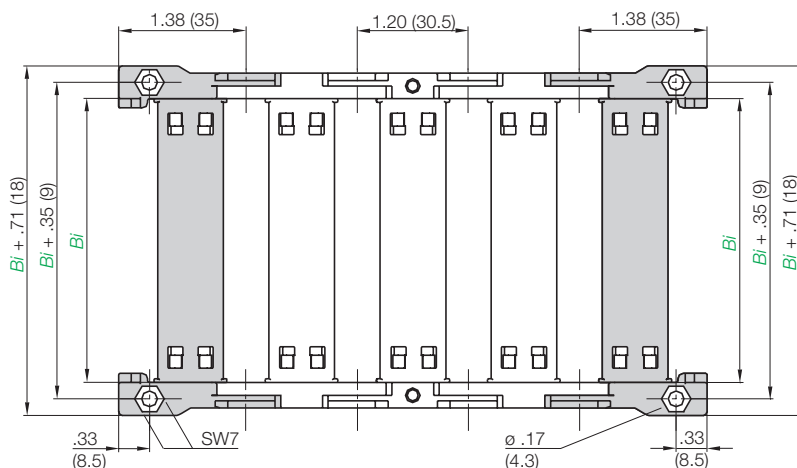
Single-part order:

E4-210-030-1

Mounting bracket moving end

E4-210-030-2

Mounting bracket fixed end



Width	Part No. Full Set	Bi in. (mm)	Width	Part No. Full Set	Bi in. (mm)
-030-	E4-210-030-12	1.18 (30)	-080-	E4-210-080-12	3.15 (80)
-040-	E4-210-040-12	1.57 (40)	-090-	E4-210-090-12	3.54 (90)
-050-	E4-210-050-12	1.97 (50)	-100-	E4-210-100-12	3.94 (100)
-060-	E4-210-060-12	2.36 (60)	-110-	E4-210-110-12	4.33 (110)
-070-	E4-210-070-12	2.75 (70)	-120-	E4-210-120-12	4.72 (120)

**Special feature mounting brackets KMA: Series E4-21**

- Mounting brackets with attachment points on all sides
- Mounting hole is countersunk for socket head screw (M4) and hexagon nut (M4)
- **Attention:** Mounting brackets always need to end with an inner link (odd number of links)





E4-28
R4-28



Energy Chain system® E4-1 Series E4-28/R4-28

Price Index



Series E4-28



Series R4-28

Special Options Available



Low noise version available with special rubber pads



Cleanroom test upon request



ESD classification:
Electrically conductive
ESD/ATEX version upon request

Assembly Tips



Opening Energy Chains®: Remove crossbars and clips - Insert screwdriver into the slot, push down, release by lever action



Remove lids/bottoms (Energy Tubes) - Insert screwdriver into the slot, release by lever action

Other Installation Methods

Vertical, hanging ≤ 262 ft (80 m)

Vertical, standing ≤ 16.4 ft (5 m)

Side-mounted, un supp. ≤ 6.56 ft (2 m)

Rotary requires further calculation

Usage Guidelines



- If quiet operation is required
- If very high speeds and/or accelerations are required
- Long travels
- High fill weights



- When an extremely low vibration Energy Chain®/Energy Tube is required
 - Series E6-29
 - Series R6-29
- When an economic one-sided snap-open Energy Chain®/Energy Tube is required
 - Series 2400/2450/2480/2500

Features & Benefits

- 1 Wide, rounded plastic crossbars - cable friendly
- 2 Low-noise operation through integrated brake in the radial stop dog system
- 3 Hinged snap-open removable lids along outer radius of Energy Tube
- 4 Straight run through inner-/outer-link design
- 5 The tongue and groove design provides greater lateral stability
- 6 15% more tensile strength (compared to the older E4 series), better Optimized glide pads - long service life
- 7 Shelving program with a wide range of options
- 8 Crossbars are removable along both radii
- 9 15% more tensile strength (compared to the best E4 series), better unsupported length through improved stop dog system and vertical radial stops
- 10 Version NCST "without camber" simply by turning outer links without unnecessary rework



Also available without camber.
Add NCST to the end of the part number.
Ex: E4-28-300-250NCST

Order Example: Complete Energy Chain®

Please indicate chain length or number of links. Example:

9.84 ft (3 m) E4-28-300-250-0

With 2 separators 2211 assembled every 2nd link

1 Set E4-280-300-12



Energy Chain®



Interior Separation



Mounting Bracket

Energy Chain system® E4-1 Series E4-28/R4-28 Installation Dimensions

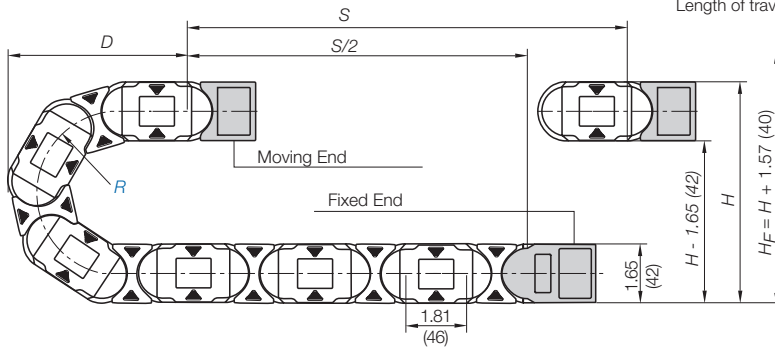
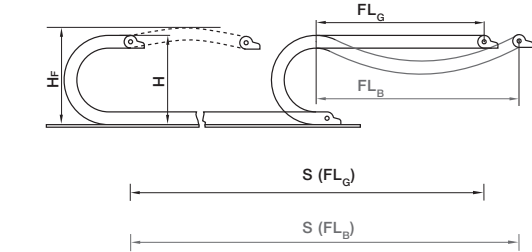
energy chain® configurator

igus®

E4-28
R4-28

Short travel, unsupported length

- FL_B = unsupported with permitted sag
 - FL_G = unsupported with straight upper run
- Further information ► Design, Chapter 1, main catalog

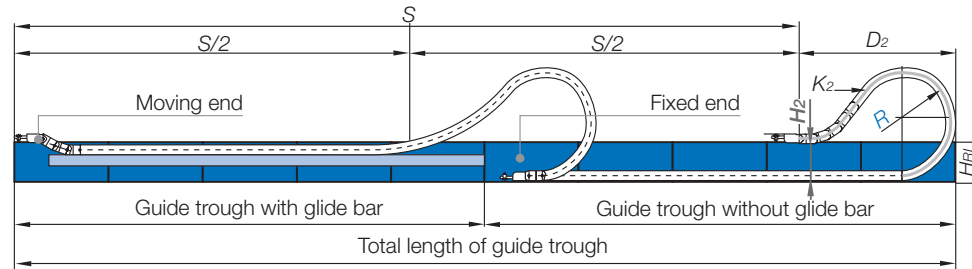


The required clearance height: $H_F = H + 1.57$ in. (40 mm) (with .67 lbs/ft (1.0 kg/m) fill weight). Please consult igus® if space is particularly restricted.

R	2.17 (055)	2.48 (063)	2.95 (075)	3.94 (100)	4.92 (125)	5.91 (150)	6.89 (175)	7.87 (200)	9.84 (250)
H	5.98 (152)	6.61 (168)	7.56 (192)	9.53 (242)	11.50 (292)	13.46 (342)	15.43 (392)	17.40 (442)	21.34 (542)
D	4.80 (122)	5.12 (130)	5.59 (142)	6.57 (167)	7.56 (192)	8.54 (217)	9.53 (242)	10.51 (267)	12.48 (317)
K	10.43 (265)	11.42 (290)	12.99 (330)	16.14 (410)	19.09 (485)	22.24 (565)	25.78 (655)	28.54 (725)	34.65 (880)

For long travels with lowered mounting height

Long travel lengths from 32.8 ft.(10m) to max. 656 ft. (200m)

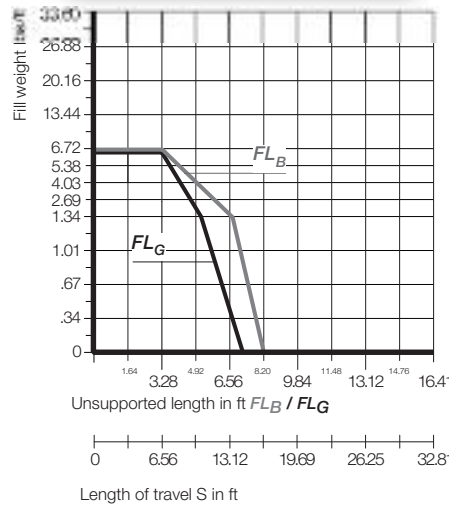


R	2.17 (055)	2.48 (063)	2.95 (075)	3.94 (100)	4.92 (125)	5.91 (150)	6.89 (175)	7.87 (200)	9.84 (250)
H ₂	-	-	-	6.22 (158)	6.22 (158)	6.22 (158)	6.22 (158)	6.22 (158)	6.22 (158)
D ₂₊₂₅	-	-	-	13.78 (350)	19.29 (490)	20.87 (530)	26.18 (665)	28.74 (730)	36.81 (935)
K ₂	-	-	-	23.54 (598)	30.79 (782)	36.22 (920)	43.46 (1104)	48.89 (1242)	63.39 (1610)



For support of the lower run, see Chapter 9 of the main catalog for the Support Tray tool kit

Speed / acceleration FL_G	max. 65.6 ft/s (20 m/s) / max. 656 ft/s² (200 m/s²)
Speed / acceleration FL_B	max. 9.84 ft/s (3 m/s) / max. 19.69 ft/s² (6 m/s²)
Gliding speed / acceleration (maximum)	max. 32.8 ft/s (10 m/s) / max. 164 ft/s² (50 m/s²)
Material - permitted temperature	igumid G / -40°F (-40°C) up to +248°F (+120°C)
Flammability Class, igumid G	VDE 0304 IIC UL94 HB



Short Travels - Unsupported

Unsupported Energy Chains® feature positive camber over short travels. This must be accounted for when specifying the clearance height. Please refer to Installation dimensions for further details.

Legend

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

Pitch per link: = 1.81" (46 mm)
Links per ft (m): = 6.71 (22)
For center mount applications:
Chain length = $\frac{S}{2} + K$

Long Travels - Gliding



If the unsupported length is exceeded, the Energy Chain®/Tube must glide on itself. This requires a guide trough.

Design, Chapter 1, main catalog

Technical Data



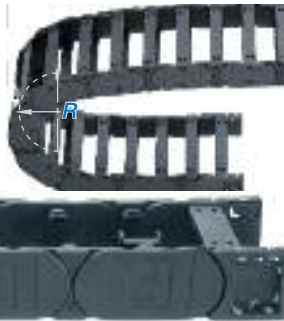
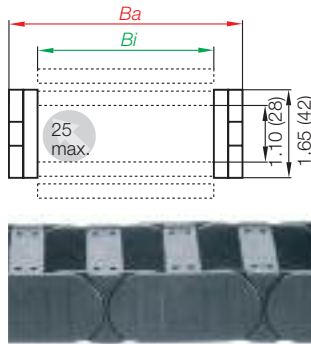
Details of material properties

► Chapter 1

PDF: www.igus.com/e-chain-pdfs
Specs/CAD/RFQ: www.igus.com/e-chains
RoHS info: www.igus.com/RoHS

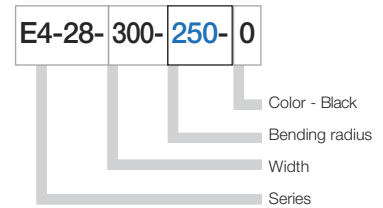


Series E4-28 - Energy Chain® with crossbars every link

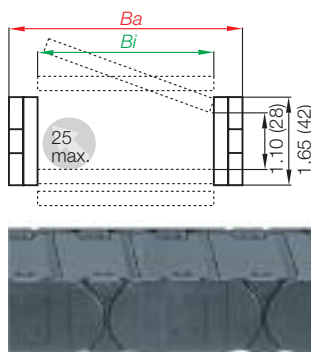


- Robust solution with crossbars every link
- Can be opened from two sides
- Removable crossbars

Part Number Structure

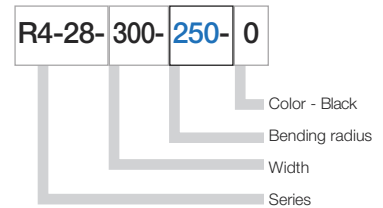


Series R4-28 - fully enclosed Energy Tube

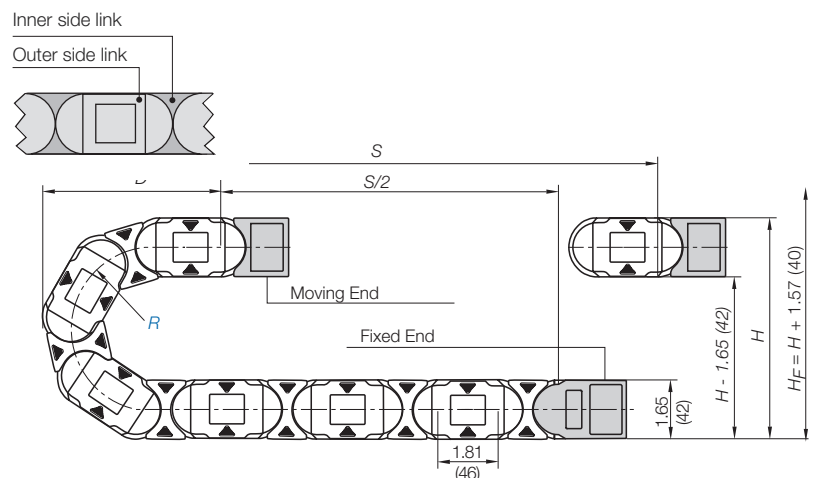
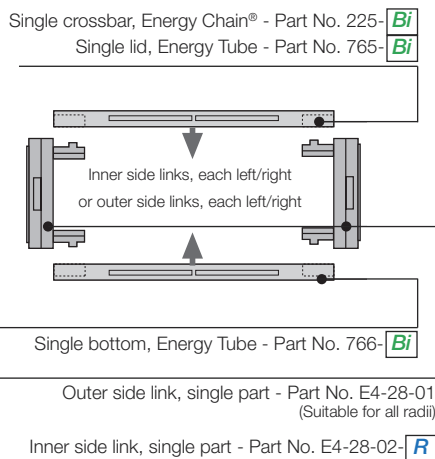


- Fully enclosed
- Excellent cable and hose protection against dirt
- Protection against hot chips
- Lids along inner radius are completely removable
- Lids along the outer radius are single-sided, snap open, hinged on one side as well as completely removable

Part Number Structure



Energy Chain® as separate parts, links and side plates



Energy Chain system® E4-1

Series E4-28/R4-28

Product Range

energy chain® configurator



E4-28
R4-28

Supplement part number with required radius. Example: E4-28-300-**250**-0
Pitch: 1.81 in. (46mm) per link links/ft(m) = 6.71 (22)

Part Number.									
Crossbars	Tube			<i>Bi</i>	<i>Ba</i>	E4-28	R4-28		
Every link	Version			in. (mm)	in. (mm)	lbs/ft (kg/m)	lbs/ft (kg/m)		
E4-28-040-		☐	-0	1.57 (40)	2.36 (60)	≈ 0.71 (1.06)	–		
E4-28-050-	R4-28-050-	☐	-0	1.97 (50)	2.76 (70)	≈ 0.75 (1.11)	≈ 1.48 (2.20)		
E4-28-062-		☐	-0	2.44 (62)	3.23 (82)	≈ 0.79 (1.17)	–		
E4-28-070-		☐	-0	2.76 (70)	3.54 (90)	≈ 0.81 (1.20)	–		
E4-28-075-		☐	-0	2.95 (75)	3.74 (95)	≈ 0.83 (1.23)	–		
E4-28-087-		☐	-0	3.43 (87)	4.21 (107)	≈ 0.86 (1.28)	–		
E4-28-100-	R4-28-100-	☐	-0	3.94 (100)	4.72 (120)	≈ 0.92 (1.37)	≈ 1.71 (2.54)		
E4-28-125-	R4-28-125-	☐	-0	4.92 (125)	5.71 (145)	≈ 1.01 (1.51)	≈ 1.87 (2.78)		
E4-28-150-	R4-28-150-	☐	-0	5.91 (150)	6.69 (170)	≈ 1.08 (1.61)	≈ 2.03 (3.02)		
E4-28-175-	R4-28-175-	☐	-0	6.89 (175)	7.68 (195)	≈ 1.15 (1.71)	≈ 2.19 (3.26)		
E4-28-200-	R4-28-200-	☐	-0	7.87 (200)	8.66 (220)	≈ 1.24 (1.84)	≈ 2.35 (3.50)		
E4-28-225-	R4-28-225-	☐	-0	8.86 (225)	9.65 (245)	≈ 1.34 (1.99)	≈ 2.57 (3.82)		
E4-28-250-	R4-28-250-	☐	-0	9.84 (250)	10.63 (270)	≈ 1.44 (2.14)	≈ 2.67 (3.98)		
E4-28-275-		☐	-0	10.83 (275)	11.61 (295)	≈ 1.53 (2.27)	–		
E4-28-300-	R4-28-300-	☐	-0	11.81 (300)	12.60 (320)	≈ 1.61 (2.39)	≈ 3.00 (4.46)		
Choose from the radii below for all of the above sizes									
<i>Radius</i> (mm) Example: E4-28-300- 250 -0									
	055*	063*	075	100	125	150	175	200	250
<i>R</i>	2.17 (055*)	2.48 (063*)	2.95 (075)	3.94 (100)	4.92 (125)	5.91 (150)	6.89 (175)	7.87 (200)	9.84 (250)
<i>H</i>	5.98 (152)	6.61 (168)	7.56 (192)	9.53 (242)	11.50 (292)	13.46 (342)	15.43 (392)	17.40 (442)	21.34 (542)
<i>D</i>	4.80 (122)	5.12 (130)	5.59 (142)	6.57 (167)	7.56 (192)	8.54 (217)	9.53 (242)	10.51 (267)	12.48 (317)
<i>K</i>	10.43 (265)	11.42 (290)	12.99 (330)	16.14 (410)	19.09 (485)	22.24 (565)	25.78 (655)	28.54 (725)	34.65 (880)

* This radius is not available for the R4-28 Series

0 = Standard color black.

For other colors see Chapter 1, main catalog

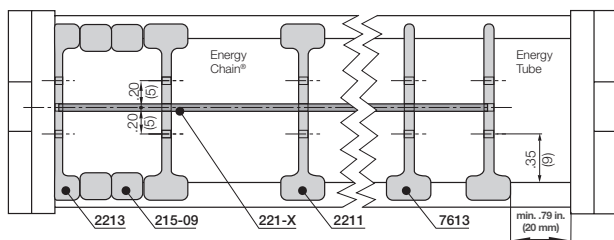
PDF: www.igus.com/e-chain-pdfs
Specs/CAD/RFO: www.igus.com/e-chains
RoHS info: www.igus.com/RoHS



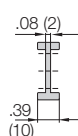
**Option 1: Vertical separators and spacers**

Vertical separators are used if a vertical subdivision of the Energy Chain® interior is required. By standard, vertical separators are assembled every other Energy Chain® link.

NOTE: Observe a lateral spacing of at least .79 in. (20 mm) for Energy Tubes and

**STANDARD**

Vertical
separator
2201



Vertical separator
(Chain only)

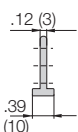
Unassembled	Part No. 2201
Assembled	Part No. 2211

- Vertical separator 2201 for Energy Chains®

This separator is used for vertical subdivision. Because they are slotted, separators can also be used horizontally to form simple compartments.



Vertical
separator
7603



Vertical separator
(tube only)

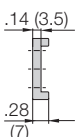
Unassembled	Part No. 7603
Assembled	Part No. 7613

- Vertical separator 7603 for Energy Tubes

This separator is used for vertical subdivision. Because they are slotted, separators can also be used horizontally to form simple compartments.



Side plate
2203



Side plate
(chain only)

Unassembled	Part No. 2203
Assembled	Part No. 2213

- Side plate 2203 for Energy Chains®

Used in conjunction with full-width shelf 220-XX, this option is used for applications involving many thin cables with similar diameters.



Spacers
205-09

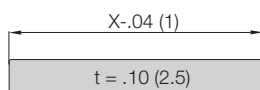


Spacer
(chain only)

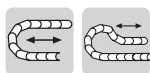
Unassembled	Part No. 205-09
Assembled	Part No. 215-09

- NOTE ON SPACERS**

Vertical separators are adjustable, but can be fixed in position by means of a spacer. Spacers are most often necessary for side mounted applications. The available inner height is reduced by .08" (2mm) **per spacer** (for example if one spacer is placed on either side of the separator, the overall inner height is reduced by .16" (4mm). To avoid this, place the spacers on the **outside** of the opening crossbar (**not for long travels**).

Full-width shelf 220-XX

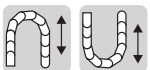
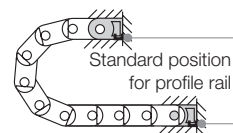
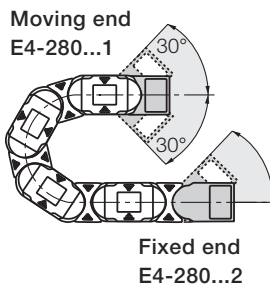
Width X in. (mm)	Part No. Unassembled	Part No. Assembled	Width X in. (mm)	Part No. Unassembled	Part No. Assembled
1.57 (.040)	220-40	221-40	3.94 (100)	220-100	221-100
1.97 (.050)	220-50	221-50	4.92 (125)	220-125	221-125
2.44 (.062)	220-62	221-62	5.91 (150)	220-150	221-150
2.76 (.070)	220-70	221-70	6.89 (175)	220-175	221-175
2.95 (.075)	220-75	221-75	7.87 (200)	220-200	221-200
3.43 (.087)	220-87	221-87			



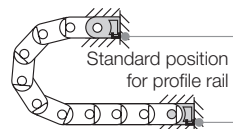
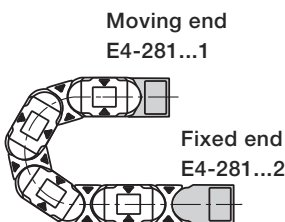
Standard

Option 1: pivoting

- Unsupported and gliding applications
- mounting capabilities on all sides
- Bolted connection outside of chain cross-section
- Space-restricted conditions
- corrosion-resistant

**Option 2: locking**

- Vertical hanging/standing applications
- For high accelerations
- Universally mountable
- Various mounting positions
- Corrosion-resistant

**Part Number Structure**

E4-281-040-2-12



Full Set
Complete Set
Width
E4-280 = Pivoting
E4-281 = Locking

Full set, for both ends:

E4-280-040-12

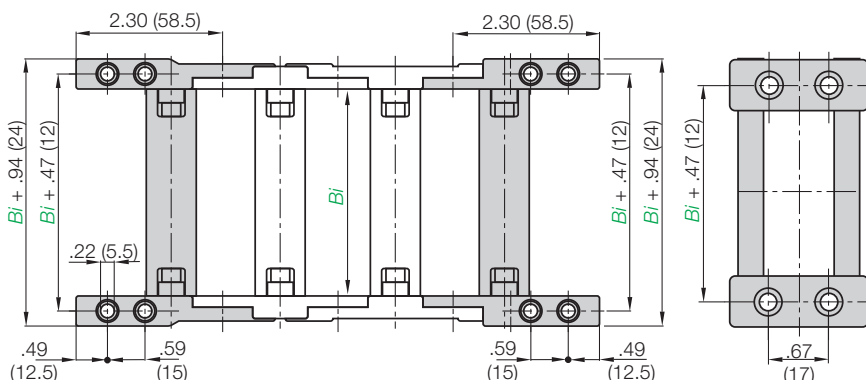
Single-part order:

E4-280-040-1

Mounting bracket moving end

E4-280-040-2

Mounting bracket fixed end



Part number example is shown for pivoting brackets.
For locking brackets change part number to E4-281

Part No. Full Set (pivoting)
Series E4-28
E4-28-Width-12

Width	Part No. Full Set		<i>Bi</i> in. (mm)
	Pivoting	Locking	
-040	E4-280	E4-281	-040-12 1.57 (40)
-050	E4-280	E4-281	-050-12 1.97 (50)
-062	E4-280	E4-281	-062-12 2.44 (62)
-070	E4-280	E4-281	-070-12 2.76 (70)
-075	E4-280	E4-281	-075-12 2.95 (75)
-087	E4-280	E4-281	-087-12 3.43 (87)
-100	E4-280	E4-281	-100-12 3.94 (100)
-125	E4-280	E4-281	-125-12 4.92 (125)
-150	E4-280	E4-281	-150-12 5.91 (150)
-175	E4-280	E4-281	-175-12 6.89 (175)
-200	E4-280	E4-281	-200-12 7.87 (200)
-225	E4-280	E4-281	-225-12 8.86 (225)
-250	E4-280	E4-281	-250-12 9.84 (250)
-275	E4-280	E4-281	-275-12 10.83 (275)
-300	E4-280	E4-281	-300-12 11.81 (300)

Due to the design of the E4-28 series chains,
please note the following when ordering brackets:

Even number of links = full set, part number ending in -12
Odd number of links = 2 pieces, part number ending in -2

**Series E4-28/R4-28
Strain Relief**

Strain relief tiewrap plate Part No. 2050-Z can be fixed
on the last crossbar. **Details ► chapter 10 main catalog**

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

Energy Chain system® E4-1

Series E4-28/R4-28

Guide Trough

energy chain® configurator ►

igus®

E4-28
R4-28

Guide troughs are used with applications where the upper run of the Energy Chain® glides on the lower run. If using igus® steel guide troughs, the following components are required:

- Full travel length of guide trough
Part No. 96-30
- 1/2 travel length of glide bars
Part No. 92-01
- Installation sets as end connectors
Part No. 95-50-XX

-XX indicates the length of the profile rail on which the guide trough is mounted. The values and part numbers are specified in the table on the left. Standard length of the trough components and glide bars is 6.56 ft (2m). The required overall length of the guide trough directly correlates to the length of travel.

Example:

Length of travel 164 ft. (50 m)
Center mounted

Required guide troughs:

164 ft (50 m) guide trough,
82 ft (25 m) glide bar
= 25 sections of 6.56 ft (2 m) guide trough

Part No. 96-30

= 13 sections of 6.56 ft. (2 m) glide bar

Part No. 92-01

Required number of installation sets
= Number of guide trough components + 1
= 25 + 1 = 26

Part number of the installation sets

95-50-XXX

Example: 95-50-400 for
15.75 (400 mm) long profile rail



Left: Guide trough with glide bars

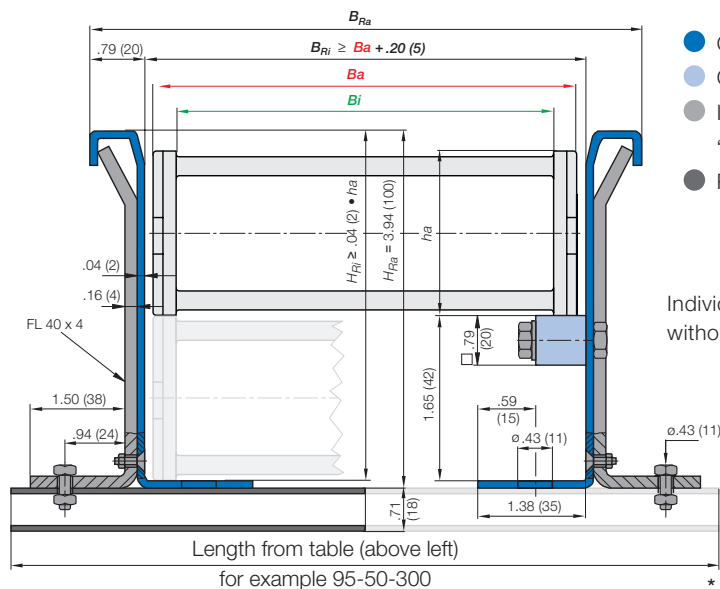
Right: Guide troughs without glide bars



Installation sets as section connectors

Width of Crossbar
E4-28-040-200-0

	B_{Ri}	Installation Part No.
-040	2.56 (65)	*
-050	2.95 (75)	95-50-200
-062	3.43 (87)	95-50-200
-070	3.74 (95)	95-50-200
-075	3.94 (100)	95-50-225
-100	4.92 (125)	95-50-250
-125	5.91 (150)	95-50-275
-150	6.89 (175)	95-50-300
-175	7.87 (200)	95-50-325
-200	8.86 (225)	95-50-350
-225	9.84 (250)	95-50-375
-250	10.83 (275)	95-50-400
-275	11.81 (300)	95-50-425
-300	12.80 (325)	95-50-450



- Guide trough
- Glide bars
- Installation set "Basic"
- Profile rail

Individual attachment without profile rail

* Specialized guide trough available upon request

Standard length profile rail

PDF: www.igus.com/e-chain-pdfs
Specs/CAD/Rfq: www.igus.com/e-chains
RoHS info: www.igus.com/RoHS



E4-32
H4-32
R4-32



Energy Chain system® E4-1 Series E4-32/H4-32/R4-32

Price Index



Series E4-32



Series H4-32



Series R4-32

Special Options Available



Low noise version available
with special rubber pads



Cleanroom test upon request



ESD classification:
Electrically conductive
ESD/ATEX version upon request

Assembly Tips



Opening Energy Chains®: Remove crossbars and clips - Insert screwdriver into the slot, push down, release by lever action



Remove lids/bottoms (Energy Tubes) - Insert screwdriver into the slot, release by lever action

Other Installation Methods

Vertical, hanging ≤ 262 ft (80 m)

Vertical, standing ≤ 16.4 ft (5 m)

Side-mounted, un supp. ≤ 4.92 ft (1.5 m)

Rotary requires further calculation

Usage Guidelines



- If quiet operation is required
- If very high speeds and/or accelerations are required
- Long travels
- High additional loads



- When an extremely low vibration Energy Chain® is required
➤ **Series E6-35**
- When an economic one-sided snap-open Energy Chain®/Energy Tube is required
➤ **Series 2600/2650/2680/2700**

Features & Benefits

- 1 Wide, rounded plastic crossbars - cable friendly
- 2 Low-noise operation through integrated brake in the radial stop dog system
- 3 Hinged snap-open removable lids - Energy Tube
- 4 Straight run through inner-/outer-link design
- 5 Strain relief with strain relief separators in the mounting bracket are available
- 6 The tongue and groove design provides greater lateral stability
- 7 QuickLock Crossbar, 385-X-Q, available for faster assembly/disassembly
- 8 Optimized glide pads - long service life
- 9 New Interior separation kit available
- 10 Crossbars are removable along both radii
- 11 15% more tensile strength (compared to the older E4 series), better unsupported length through improved stop dog system and vertical radial stops
- 12 Smooth outline, dirt repellent
- 13 Version NCST "without camber" simply by turning outer links without unnecessary rework



Also available without camber.
Add NCST to the end of the
part number.
Ex: E4-32-30-300NCST



Order Example: Complete Energy Chain®

Please indicate chain length or number of links. Example:

13.12 ft (4 m) **E4-32-30-300-0**

With 2 separators **282** assembled every 2nd link

1 Set **E4-320-30-12P**



Energy Chain®



Interior Separation



Mounting Bracket

Energy Chain system® E4-1 Series E4-32/H4-32/R4-32 Installation Dimensions

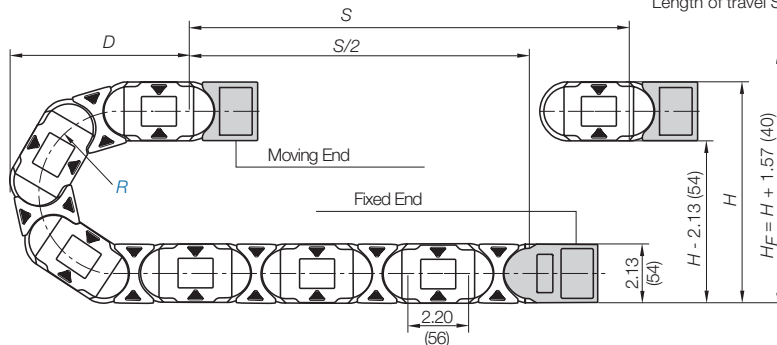
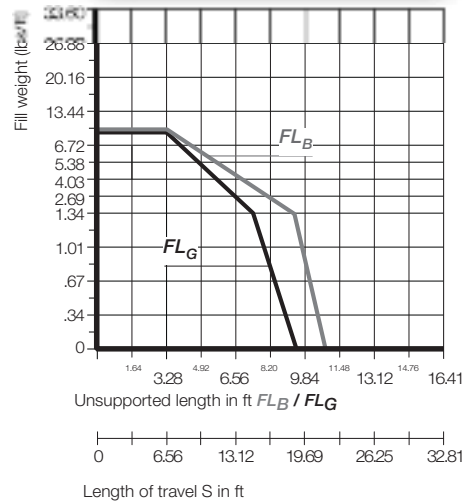
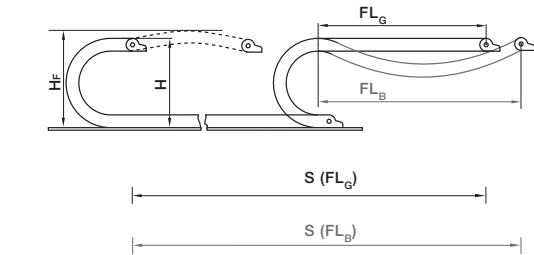
energy chain® configurator



E4-32
H4-32
R4-32

Short travel, unsupported length

- FL_B = unsupported with permitted sag
 - FL_G = unsupported with straight upper run
- Further information ► Design, Chapter 1, main catalog



The required clearance height: $H_F = H + 1.57$ in. (40 mm) (with 1.34 lbs/ft (2.0 kg/m) fill weight).
Please consult igus® if space is particularly restricted.

Pitch per link: = 2.20" (56 mm)
Links per ft (m): = 5.49 (18)
For center mount applications:
Chain length = $\frac{S}{2} + K$

Short Travels - Unsupported

Unsupported Energy Chains® feature positive camber over short travels. This must be accounted for when specifying the clearance height. Please refer to **Installation dimensions** for further details.

Legend

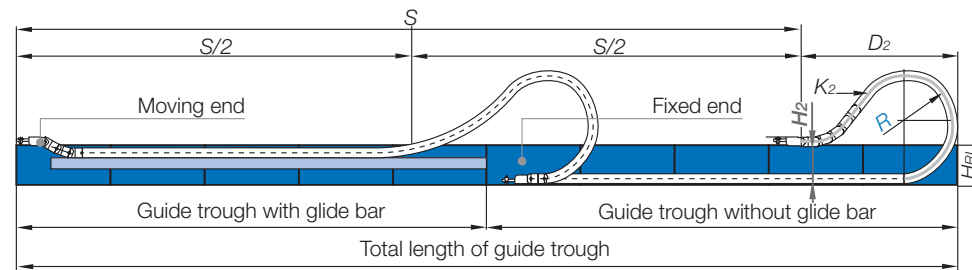
- S = Length of travel
- R = Bending radius
- H = Nominal clearance height
- D = Overlength Energy Chain® radius in final position
- $K = \pi \cdot R + \text{safety buffer}$
- H_F = Required clearance height
- H_{RI} = Trough inner height
- H_2 = *Mounting height
- D_2 = Overlength - long travels, gliding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

R	2.48 (063)	2.95 (075)	3.94 (100)	4.92 (125)	5.91 (150)	6.89 (175)	7.87 (200)	8.66 (220)	9.84 (250)	11.81 (300)
H	7.09 (180)	8.07 (205)	10.04 (255)	12.01 (305)	13.98 (355)	15.51 (405)	17.91 (455)	19.49 (495)	21.85 (555)	25.79 (655)
D	5.75 (146)	6.22 (158)	7.20 (183)	8.19 (208)	9.17 (233)	10.16 (258)	11.14 (283)	11.93 (303)	13.11 (333)	15.08 (383)
K	12.20 (310)	13.78 (350)	16.93 (430)	19.88 (505)	23.03 (585)	26.18 (665)	29.33 (745)	31.69 (805)	35.43 (900)	41.54 (1055)

For long travels with lowered mounting height

Long travel lengths from 32.8 ft.(10m) to max. 656 ft. (200m)

For center mount applications:
Chain length: = $\frac{S}{2} + K_2$



R	2.48 (063)	2.95 (075)	3.94 (100)	4.92 (125)	5.91 (150)	6.89 (175)	7.87 (200)	8.66 (220)	9.84 (250)	11.81 (300)
H ₂	-	-	6.54 (166)	6.54 (166)	6.54 (166)	6.54 (166)	6.54 (166)	6.54 (166)	6.54 (166)	6.54 (166)
D ₂	-	-	14.57 (370)	18.50 (470)	19.69 (500)	25.79 (655)	30.31 (770)	35.43 (900)	36.61 (930)	43.31 (1100)
K ₂	-	-	24.25 (616)	30.87 (784)	35.27 (896)	44.10 (1120)	50.71 (1288)	57.32 (1456)	61.73 (1568)	75.00 (1904)



For support of the lower run, see Chapter 9 of the main catalog for the **Support Tray tool kit**

Long Travels - Gliding



If the unsupported length is exceeded, the Energy Chain®/Tube must glide on itself. This requires a guide trough.

Design, Chapter 1, main catalog

Technical Data

Speed / acceleration FL_G	max. 65.6 ft/s (20 m/s) / max. 656 ft/s² (200 m/s²)
Speed / acceleration FL_B	max. 9.84 ft/s (3 m/s) / max. 19.69 ft/s² (6 m/s²)
Gliding speed / acceleration (maximum)	max. 32.8 ft/s (10 m/s) / max. 164 ft/s² (50 m/s²)
Material - permitted temperature	igumid G / -40°F (-40°C) up to +248°F (+120°C)
Flammability Class, igumid G	VDE 0304 IIC UL94 HB



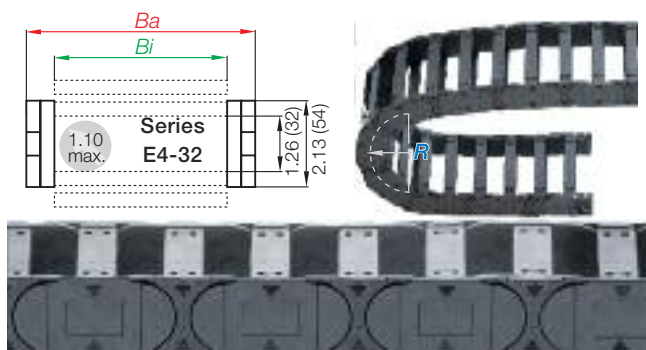
Details of material properties

► Chapter 1

PDF: www.igus.com/e-chain-pdfs
Specs/CAD/RFQ: www.igus.com/e-chains
RoHS info: www.igus.com/RoHS

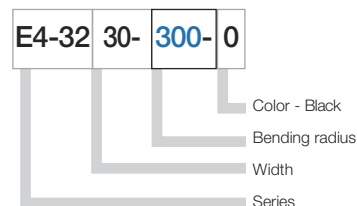


Series E4-32 - Energy Chain® with crossbars every link

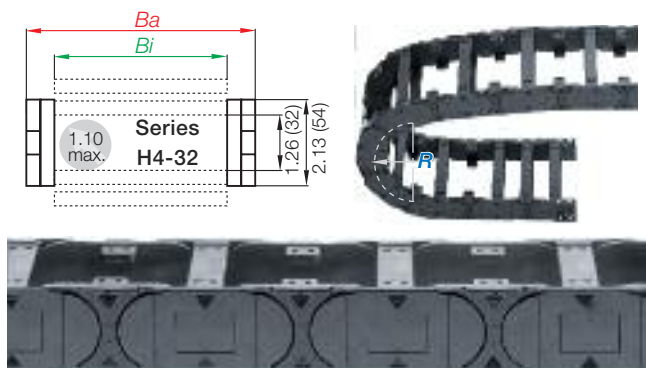


- Crossbars every link
- For use with rigid hydraulic hoses
- For particularly demanding applications
- Can be opened from both sides

Part Number Structure

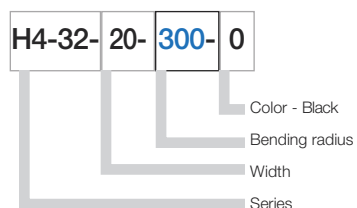


Series H4-32 - Energy Chain® with crossbars every other link

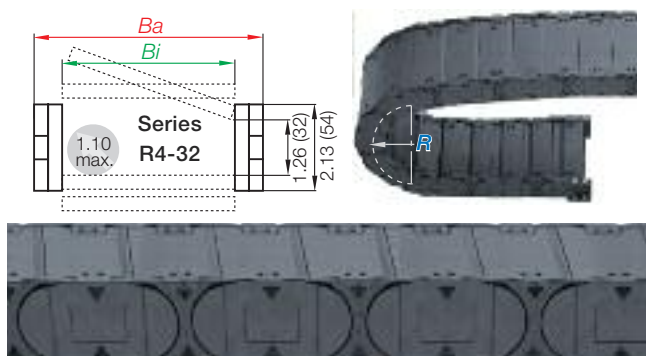


- Crossbars every other link
- Standard configuration
- For nearly every situation
- Can be opened from both sides
- Easy assembly
- Stable
- Cost-effective

Part Number Structure

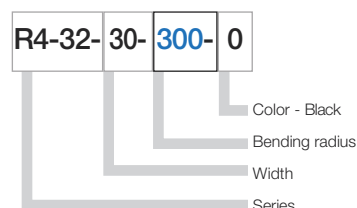


Series R4-32 - fully enclosed Energy Tube

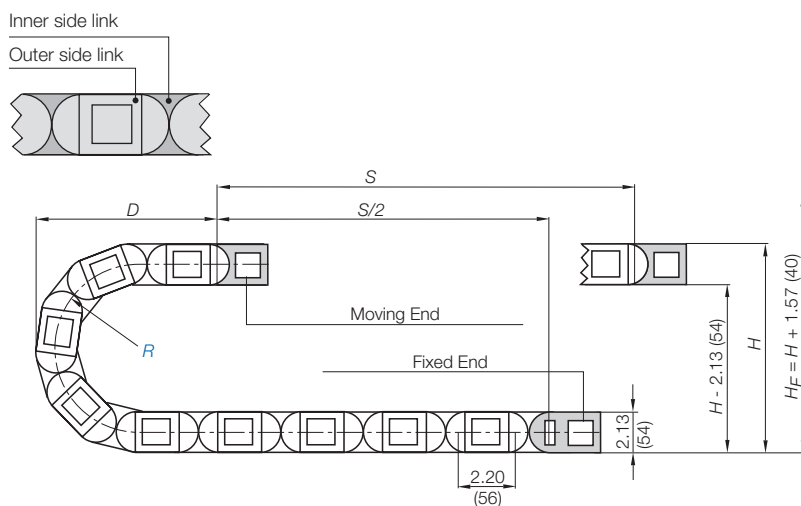
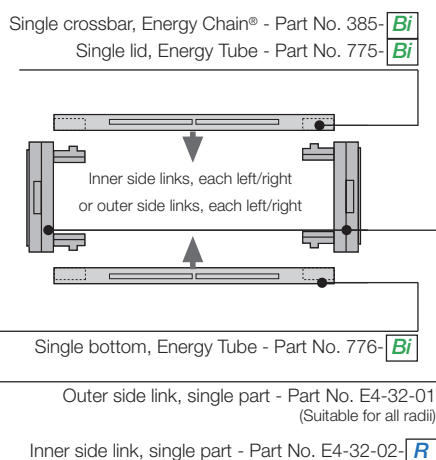


- Fully enclosed
- Excellent cable and hose protection against dirt
- Protection against hot chips up to 1652°F (900°C)
- Lids along inner radius are completely removable
- Lids along the outer radius are single-sided, snap open, hinged on one side as well as completely removable

Part Number Structure



Energy Chain® as separate parts, links and side plates



Energy Chain system® E4-1

Series E4-32/H4-32/R4-32

Product Range

energy chain® configurator



E4-32
H4-32
R4-32

Supplement part number with required radius. Example: E4-32-30-300-0
Pitch: 2.20 in. (56mm) per link links/ft(m) = 5.49 (18)

Part Number				Weight				
Crossbars Every link	Crossbars Every other	Tube Version		<i>Bi</i> in. (mm)	<i>Ba</i> in. (mm)	E4-32 lbs/ft (kg/m)	H4-32 lbs/ft (kg/m)	R4-32 lbs/ft (kg/m)
E4-32-05-	H4-32-05-	*R4-32-05-	☐ -0	1.97 (50)	2.87 (73)	≈ 1.05 (1.57)	≈ 0.96 (1.43)	≈ 1.65 (2.45)
E4-32-06-	H4-32-06-		☐ -0	2.68 (68)	3.58 (91)	≈ 1.14 (1.70)	≈ 1.00 (1.49)	–
E4-32-07-	H4-32-07-	R4-32-07-	☐ -0	2.95 (75)	3.86 (98)	≈ 1.16 (1.73)	≈ 1.01 (1.51)	≈ (1.73 2.57)
E4-32-087-	H4-32-087-		☐ -0	3.43 (87)	4.33 (110)	≈ 1.21 (1.80)	≈ 1.03 (1.54)	–
E4-32-10-	H4-32-10-	R4-32-10-	☐ -0	3.94 (100)	4.84 (123)	≈ 1.27 (1.89)	≈ 1.06 (1.58)	≈ 1.78 (2.65)
E4-32-11-	H4-32-11-	R4-32-11-	☐ -0	4.25 (108)	5.16 (131)	≈ 1.30 (1.94)	≈ 1.08 (1.61)	≈ 1.85 (2.76)
E4-32-112-	H4-32-112-		☐ -0	4.41 (112)	5.35 (136)	≈ 1.32 (1.96)	≈ 1.09 (1.62)	–
E4-32-12-	H4-32-12-	R4-32-12-	☐ -0	4.92 (125)	5.83 (148)	≈ 1.39 (2.07)	≈ 1.13 (1.68)	≈ 1.92 (2.85)
E4-32-137-	H4-32-137-		☐ -0	5.39 (137)	6.34 (161)	≈ 1.42 (2.12)	≈ 1.14 (1.70)	–
E4-32-15-	H4-32-15-	R4-32-15-	☐ -0	5.91 (150)	6.81 (173)	≈ 1.49 (2.21)	≈ 1.18 (1.75)	≈ 2.02 (3.01)
E4-32-162-	H4-32-162-		☐ -0	6.38 (162)	7.32 (186)	≈ 1.50 (2.24)	≈ 1.18 (1.76)	–
E4-32-17-	H4-32-17-	R4-32-17-	☐ -0	6.61 (168)	7.52 (191)	≈ 1.56 (2.32)	≈ 1.21 (1.80)	≈ 2.16 (3.21)
E4-32-18-	H4-32-18-		☐ -0	6.89 (175)	7.80 (198)	≈ 1.58 (2.35)	≈ 1.22 (1.81)	–
E4-32-187-	H4-32-187-		☐ -0	7.36 (187)	8.31 (211)	≈ 1.61 (2.39)	≈ 1.24 (1.84)	–
E4-32-20-	H4-32-20-	R4-32-20-	☐ -0	7.87 (200)	8.78 (223)	≈ 1.69 (2.52)	≈ 1.28 (1.90)	≈ 2.29 (3.41)
E4-32-212-	H4-32-212-		☐ -0	8.35 (212)	9.29 (236)	≈ 1.73 (2.57)	≈ 1.30 (1.93)	–
E4-32-23-	H4-32-23-		☐ -0	8.86 (225)	9.76 (248)	≈ 1.79 (2.67)	≈ 1.33 (1.98)	–
E4-32-237-	H4-32-237-		☐ -0	9.33 (237)	10.28 (261)	≈ 1.81 (2.70)	≈ 1.34 (1.99)	–
E4-32-25-	H4-32-25-	R4-32-25-	☐ -0	9.84 (250)	10.75 (273)	≈ 1.90 (2.83)	≈ 1.38 (2.06)	≈ 2.59 (3.86)
E4-32-262-	H4-32-262-		☐ -0	10.31 (262)	11.26 (286)	≈ 1.96 (2.92)	≈ 1.41 (2.10)	–
E4-32-28	H4-32-28-		☐ -0	10.83 (275)	11.73 (298)	≈ 2.01 (2.99)	≈ 1.44 (2.14)	–
E4-32-29-	H4-32-29-		☐ -0	11.30 (287)	12.24 (311)	≈ 2.02 (3.02)	≈ 1.44 (2.15)	–
E4-32-30-	H4-32-30-	R4-32-30-	☐ -0	11.81 (300)	12.72 (323)	≈ 2.12 (3.15)	≈ 1.49 (2.22)	≈ 2.85 (4.25)
E4-32-312-	H4-32-312-		☐ -0	12.28 (312)	13.23 (336)	≈ 2.14 (3.18)	≈ 1.50 (2.23)	–
E4-32-325-	H4-32-325-		☐ -0	12.79 (325)	13.70 (348)	≈ 2.20 (3.28)	≈ 1.53 (2.28)	–
E4-32-337-	H4-32-337-		☐ -0	13.27 (337)	14.21 (361)	≈ 2.24 (3.34)	≈ 1.55 (2.31)	–
E4-32-350-	H4-32-350-		☐ -0	13.78 (350)	14.69 (373)	≈ 2.40 (3.57)	≈ 1.63 (2.42)	–
E4-32-362-	H4-32-362-		☐ -0	14.25 (362)	15.20 (386)	≈ 2.46 (3.66)	≈ 1.66 (2.47)	–
E4-32-375-	H4-32-375-		☐ -0	14.76 (375)	15.67 (398)	≈ 2.51 (3.74)	≈ 1.69 (2.51)	–
E4-32-387-	H4-32-387-		☐ -0	15.24 (387)	16.18 (411)	≈ 2.55 (3.80)	≈ 1.71 (2.54)	–
E4-32-400	H4-32-400-		☐ -0	15.75 (400)	16.65 (423)	≈ 2.60 (3.87)	≈ 1.73 (2.58)	–

Choose from the radii below for all of the above sizes

Radius (mm) Example: E4-32-30-300-0

	063**	075**	100**	125	150	175	200	220	250	300
<i>R</i>	2.48 (063*)	2.95 (075)	3.94 (100)	4.92 (125)	5.91 (150)	6.89 (175)	7.87 (200)	8.66 (220)	9.84 (250)	11.81 (300)
<i>H</i> $\frac{0}{20}$	7.09 (180)	8.07 (205)	10.04 (255)	12.01 (305)	13.98 (355)	15.94 (405)	17.91 (455)	19.49 (495)	21.85 (555)	25.79 (655)
<i>D</i>	5.75 (146)	6.22 (158)	7.20 (183)	8.19 (208)	9.17 (233)	10.16 (258)	11.14 (283)	11.93 (303)	13.11 (333)	15.08 (383)
<i>K</i>	12.20 (310)	13.78 (350)	16.93 (430)	19.88 (505)	23.03 (585)	26.18 (665)	29.33 (745)	31.69 (805)	35.43 (900)	41.54 (1055)

** This radius is not available for the R4-32 Series

*Removable lid only, no hinged option

0 = Standard color black.

For other colors see Chapter 1, main catalog

For wider chains see page 32.

For large diameter hoses see page 32

PDF: www.igus.com/e-chain-pdfs
Specs/CAD/RFO: www.igus.com/e-chains
RoHS info: www.igus.com/RoHS



Energy Chain system® E4-1 Series E4-32/H4-32/R4-32 Interior Separation

energy chain® configurator

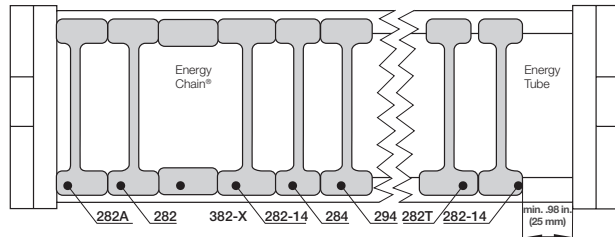


E4-32
H4-32
R4-32



Vertical separators and spacers

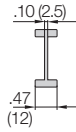
Vertical separators are used if a vertical subdivision of the Energy Chain® interior is required. By standard, vertical separators are assembled every other Energy Chain® link.



NOTE: Observe a lateral spacing of at least .98 in. (25mm) for Energy Tubes



Vertical separator
280



Separator (chain/tube)

Unassembled	Part No. 280
Assembled	Part No. 281

- **Standard separator 280 for Energy Chains® and Energy Tubes**

This separator offers safe stability due to its wide base design, also when used with thick cables or hoses.



Vertical separator
280 -14



Separator (chain/tube)

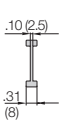
Unassembled	Part No. 280-14
Assembled	Part No. 281-14

- **Vertical separator 280-14 for Energy Chains® and Energy Tubes**

This separator offers safe stability due to its broad base design when used with thick cables or hoses.



Vertical separator
283



Separator (chain only)

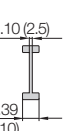
Unassembled	Part No. 283
Assembled	Part No. 284

- **Vertical separator 283 for Energy Chains®**

This separator features a narrow base for use in applications where a large number of small cables need to be individually separated.



Locking separator
293



Locking Separator (chain only)

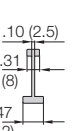
Unassembled	Part No. 293
Assembled	Part No. 294

- **Locking separator 293 for Energy Chains®**

This separator is used in applications with very high relative humidity. It features increased retention force which is produced by asymmetrical retention "clamps" attached to the chain's crossbar. Please ensure that they are properly aligned.



Locking separator
281T



Locking Separator (tubes only)

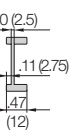
Unassembled	Part No. 281T
Assembled	Part No. 282T

- **Locking separator 281T for Energy Tubes**

It clamps to the fixed radius and remains free along the other radius to facilitate lid removal.



Asymmetric separator
281A



Asymmetric separator (chain only)

Unassembled	Part No. 280A
Assembled	Part No. 281A

- **Asymmetrical separator 281A for Energy Chains®**

This separator features an (12mm) base. It can be used in combinations between spacers of different widths and vertical separators in side mounted applications.



Spacers
381-XX



Spacer (chain only)

Unassembled	Part No. 381-XX
Assembled	Part No. 382-XX

XX = width of the spacer

- **NOTE ON SPACERS**

Vertical separators are adjustable, but can be fixed in position by means of a spacer. Spacers are most often necessary for side mounted applications. The available inner height is reduced by .08" (2mm) **per spacer** (for example if one spacer is placed on either side of the separator, the overall inner height is reduced by .16" (4mm)). To avoid this, place the spacers on the **outside** of the opening crossbar (**not for long travels**).

Spacers available in the following sizes:

Part No. Unassembled	Part No. Assembled	in.	(mm)
381 -10	382 -10	.39"	(10)
381 -15	382 -15	.59"	(15)
381 -20	382 -20	.79"	(20)

PDF: www.igus.com/e-chain-pdfs
Specs/CAD/RFQ: www.igus.com/e-chains
RoHS info: www.igus.com/RoHS





Part number example for
Energy Chain®

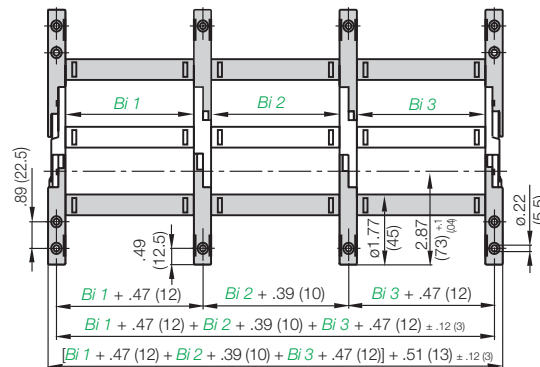
E4-32-10/20/10-200-0

E4-32-*Bi1/Bi2/Bi3*-R-0

We **strongly recommend** on-site consultation with an igus® technician for individual advice regarding mounting brackets, guide troughs and other design details.

Extension links - for extremely wide Energy Chains® up to 9.84 ft (3m)

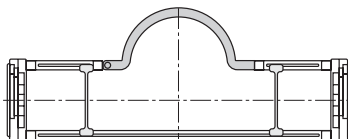
- For applications in which particularly high fill weights necessitate extremely wide Energy Chains®
- The extension link design allows virtually limitless side-by-side attachment of chains
- The unsupported length of a chain can be increased when additional loads are required
- Extension links can be used with Energy Chains®, Energy Tubes or a combination of both
- They are suitable for unsupported and gliding applications in a guide trough
- Energy Chains® with extension links are attached with KMA or steel mounting brackets.



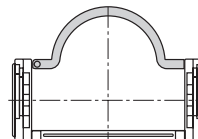
Consult igus® for your extender crossbar applications. We will be happy to assist you with your design layout.

Extender crossbars - For careful guiding of large diameter cables and hoses

- Intended for cables and hoses with a maximum outer diameter of 4.13 in. (105 mm).
- Gliding operation with crossbars assembled along the outer radius in conjunction with a special guide trough
- Gliding operation not guaranteed with crossbars assembled along the inner radius
- The extender crossbar can either be attached to the side links directly or can be used in combination with two standard snap-open crossbars.



Round extender crossbar combined with standard snap-open crossbars.

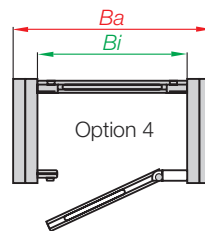
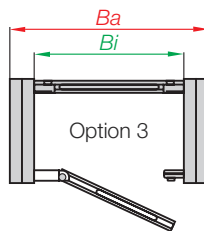
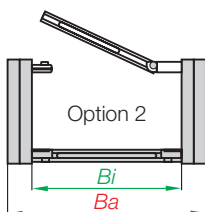
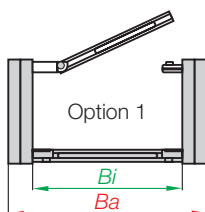


Attached directly to the side link.

Part No.	Max Ø Hose in. (mm)	Style	Installation Side Link	Combined with Snap-Open Crossbars
385-15-RHD115	4.13 (105)	Round	No	Yes
385-18-RD115	4.13 (105)	Round	Yes	No

Hinged crossbars

- Typically, Energy Chain® crossbars are completely removable. In cases where it is preferable that the opening crossbars remain on the Energy Chain®, a hinged design has been developed.
- Please consult igus® for design assistance



Energy Chain system® E4-31

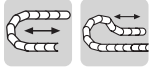
Series E4-32/H4-32/R4-32

Mounting Brackets - KMA

energy chain® configurator

igus®

E4-32
H4-32
R4-32

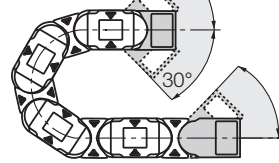


Standard

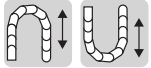
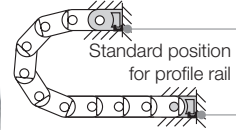
Option 1: pivoting

- Recommended for unsupported and gliding applications
- Attachment capability on all sides
- Bolted connection outside of chain cross-section
- Space restricted conditions
- Corrosion resistant

Moving end
E4-320...1



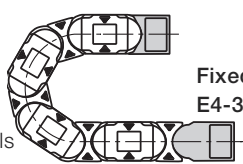
Fixed end
E4-320...2



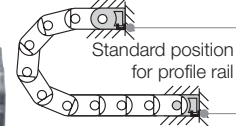
Option 2: locking

- Profile rail option
- Universal use
- Corrosion resistant
- Vertical hanging/standing travels
- Extreme accelerations

Moving end
E4-321...1



Fixed end
E4-321...2



Part Number Structure

E4-320-07-12-P

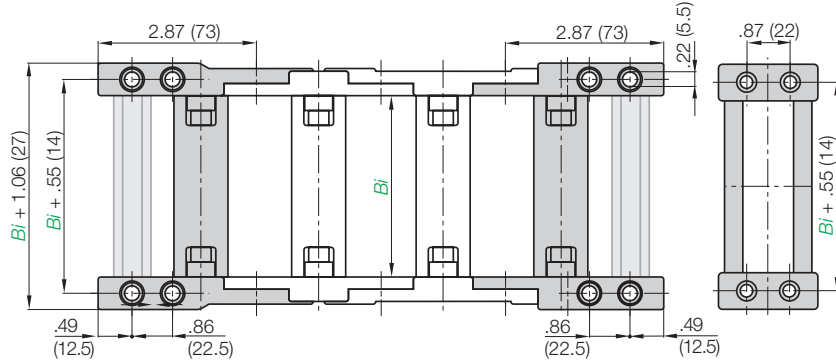
With Profile Rail

Complete Set

Width

E4-320 = Pivoting for chain
R4-320 = Pivoting for tube

E4-321 = Locking for chain
R4-321 = Locking for tube



Due to the design of the E4-32 series chains, please note the following when ordering brackets:

Even number of links = full set, part number ending in -12; Odd number of links = 2 pieces, part number ending in -2

Part number examples are shown for pivoting brackets for Energy Chain.

For locking brackets change part number to 321

Part No. Full Set (pivoting)

Series E4-32 or H4-32

E4-320-Width-12

Part No. Full Set (pivoting)

with profile rail

Series E4-32 or H4-32

E4-320-Width-12P

Part No. Full Set (pivoting)

Tube Series R4-32

R4-320-Width-12

Part No. Full Set (pivoting)

with Profile Rail

Tube Series R4-32

R4-320-Width-12P

Width	Part No. Full Set chain/tube		With Profile Rail	Bi in. (mm)
	Pivoting	Locking		
-05*	E4-320/R4-320	E4-321/R4-321	-05-12	P 1.97 (50)
-06	E4-320	E4-321	-06-12	P 2.68 (68)
-07	E4-320/R4-320	E4-321/R4-321	-07-12	P 2.95 (75)
-087	E4-320	E4-321	-087-12	P 3.43 (87)
-10	E4-320/R4-320	E4-321/R4-321	-10-12	P 3.94 (100)
-11	E4-320/R4-320	E4-321/R4-321	-11-12	P 4.25 (108)
-112	E4-320	E4-321	-112-12	P 4.41 (112)
-12	E4-320/R4-320	E4-321/R4-321	-12-12	P 4.92 (125)
-137	E4-320	E4-321	-137-12	P 5.39 (137)
-15	E4-320/R4-320	E4-321/R4-321	-15-12	P 5.91 (150)
-162	E4-320	E4-321	-162-12	P 6.38 (162)
-17	E4-320/R4-320	E4-321/R4-321	-17-12	P 6.61 (168)
-18	E4-320	E4-321	-18-12	P 6.89 (175)
-187	E4-320	E4-321	-187-12	P 7.36 (187)
-20	E4-320/R4-320	E4-321/R4-321	-20-12	P 7.87 (200)
-212	E4-320	E4-321	-212-12	P 8.35 (212)

Width	Part No. Full Set chain/tube		With Profile Rail	Bi in. (mm)
	Pivoting	Locking		
-23	E4-320	E4-321	-23-12	P 8.86 (225)
-237	E4-320	E4-321	-237-12	P 9.33 (237)
-25	E4-320/R4-320	E4-321/R4-321	-25-12	P 9.84 (250)
-262	E4-320	E4-321	-262-12	P 10.31 (262)
-28	E4-320	E4-321	-28-12	P 10.83 (275)
-29	E4-320	E4-321	-29-12	P 11.30 (287)
-30	E4-320/R4-320	E4-321/R4-321	-30-12	P 11.81 (300)
-312	E4-320	E4-321	-312-12	P 12.28 (312)
-325	E4-320	E4-321	-325-12	P 12.79 (325)
-337	E4-320	E4-321	-337-12	P 13.27 (337)
-350	E4-320	E4-321	-350-12	P 13.78 (350)
-362	E4-320	E4-321	-362-12	P 14.25 (362)
-375	E4-320	E4-321	-375-12	P 14.76 (375)
-387	E4-320	E4-321	-387-12	P 15.24 (387)
-400	E4-320	E4-321	-400-12	P 15.75 (400)

PDF: www.igus.com/e-chain-pdfs
Specs/CAD/RFQ: www.igus.com/e-chains
RoHS info: www.igus.com/RoHS



Chainfix clamps for
the profile rail

igus® Chainfix strain relief elements are available in either steel or stainless steel. They can be adjusted with a hexagon socket and are available in single, double and triple configurations.

Part No. Single Clamp		Part No. Double Clamp		Part No. Triple Clamp		Cable ø	
Steel	Stainless	Steel	Stainless	Steel	Stainless	in.	(mm)
CFX12-1M	CFX12-1E	CFX12-2	CFX12-2E	CFX12-3	–	.24 - .47	(06 - 12)
CFX14-1M	CFX14-1E	CFX14-2	CFX14-2E	CFX14-3	–	.47 - .55	(12 - 14)
CFX16-1M	CFX16-1E	CFX16-2	CFX16-2E	CFX16-3	–	.55 - .63	(14 - 16)
CFX18-1M	CFX18-1E	CFX18-2	CFX18-2E	CFX18-3	–	.63 - .71	(16 - 18)
CFX20-1M	CFX20-1E	CFX20-2	CFX20-2E	CFX20-3	–	.71 - .79	(18 - 20)
CFX22-1M	CFX22-1E	CFX22-2	CFX22-2E	CFX22-3	–	.79 - .87	(20 - 22)
CFX26-1M	CFX26-1E	CFX26-2	CFX26-2E	–	–	.87 - 1.02	(22 - 26)
CFX30-1M	CFX30-1E	CFX30-2	CFX30-2E	–	–	1.02 - 1.18	(26 - 30)
CFX34-1M	CFX34-1E	CFX34-2	CFX34-2E	–	–	1.18 - 1.34	(30 - 34)
CFX38-1M	CFX38-1E	–	–	–	–	1.34 - 1.50	(34 - 38)
CFX42-1M	CFX42-1E	–	–	–	–	1.50 - 1.65	(38 - 42)

For more information please refer to strain relief section of Chapter 10

Chainfix Clip

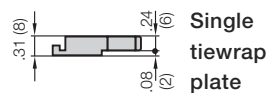
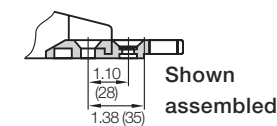


Modular snap-on strain relief device

Chainfix clips are available for cable diameters ranging from .16" (4mm) to .94" (24 mm). They are for assembly on KMA mounting brackets, clip-on strain relief for crossbars as well as profile rails. Quick assembly without the use of tools. **For more information please refer to strain relief section of Chapter 10**

Cable ø	Part No.	Part No.
in.	Clamp	Bottom
.16-.31 (04-08)	CFC-08-M	CFC-08-C
.31-.47 (08-12)	CFC-12-M	CFC-12-C
.47-.63 (12-16)	CFC-16-M	CFC-16-C
.63-.79 (16-20)	CFC-20-M	CFC-20-C
.79-.94 (20-24)	CFC-24-M	CFC-24-C

Tiewrap Plates

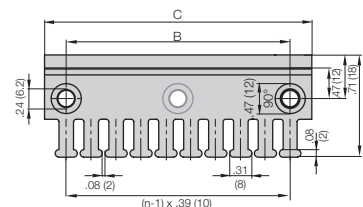


Option 1:

Tiewrap plates as an individual part

Available as an individual component, can be fixed onto a mounting bracket with the use of a profile rail.

Tiewrap Plate	n Number of Teeth	C Overall Width in. (mm)	B Bore Width in. (mm)	Center Bore
3050-ZB	5	1.97 (50)	1.18 (30)	no
3075-ZB	7	2.95 (75)	2.16 (55)	no
3100-ZB	10	3.94 (100)	3.15 (80)	no
3115-ZB	11	4.53 (115)	3.74 (95)	no
3125-ZB	12	4.92 (125)	4.13 (105)	no
3150-ZB	15	5.91 (150)	5.12 (130)	no
3175-ZB	17	6.89 (175)	6.10 (155)	no
3200-ZB	20	7.87 (200)	7.09 (180)	yes
3225-ZB	22	8.86 (225)	8.07 (205)	yes
3250-ZB	25	9.84 (250)	9.06 (230)	yes



If used with KMA brackets with profile rail please add "KMA" to the end of the part number.

Example: 3050-ZBKMA

For more information please refer to strain relief section of Chapter 10

Option 2:

Clip-on Tiewrap plates

Available as a clip-on tiewrap plate without the use of bolts. They are inserted and removed with a screwdriver used as a lever. Clip-on tiewrap plates are also available as an attachment to the opening crossbars.



Part No.	Number of Teeth	Width of Strain Relief in. (mm)
3050-ZC	5	1.97 (50)
3075-ZC	7	2.95 (75)

For more information please refer to strain relief section of Chapter 10

Energy Chain system® E4-1 Series E4-32/H4-32/R4-32 Guide Trough

energy chain® configurator ►

igus®

E4-32
H4-32
R4-32

Guide troughs are used with applications where the upper run of the Energy Chain® glides on the lower run. If using igus® steel guide troughs, the following components are required:

- Full travel length of guide trough
Part Number 98-30
- 1/2 travel length of glide bars
Part number 92-01
- Installation sets as end connectors
Part Number 93-50-XX

Width of Crossbar
E4-32-05-200-0

	B_{Ri}	Installation Part No.
-05	3.15 (78)	93-50-200
-06	3.86 (96)	93-50-225
-07	4.13 (103)	93-50-225
-087	4.61 (115)	93-50-225
-10	5.12 (128)	93-50-250
-11	5.43 (136)	93-50-250
-112	5.59 (141)	93-50-250
-12	6.10 (153)	93-50-275
-137	6.57 (166)	93-50-275
-15	7.09 (178)	93-50-300
-162	7.56 (191)	93-50-300
-17	7.80 (196)	93-50-325
-18	8.07 (203)	93-50-325
-187	8.54 (216)	93-50-325
-20	9.06 (228)	93-50-350
-212	9.53 (241)	93-50-350
-23	10.04 (253)	93-50-375
-237	10.51 (266)	93-50-375
-25	11.02 (278)	93-50-400
-262	11.50 (291)	93-50-400
-28	12.01 (303)	93-50-425
-29	12.48 (316)	93-50-425
-30	12.99 (328)	93-50-450
-312	13.46 (341)	93-50-450
-325	13.98 (353)	93-50-475
-337	14.45 (366)	93-50-475
-350	14.96 (378)	93-50-500
-362	15.43 (391)	93-50-500
-375	15.94 (403)	93-50-525
-387	16.42 (416)	93-50-525
-400	16.93 (428)	93-50-550

-XX indicates the length of the profile rail on which the guide trough is mounted. The values and part numbers are specified in the table on the left. The standard length of the trough components and glide bars is 6.56 ft (2 m.) The required overall length of the guide trough directly correlates to the length of travel.

Example:

Length of travel 164 ft (50 m)
Center mounted

Required guide troughs:

164 ft (50 m) guide trough
82 ft (25 m) glide bar
= 25 sections of 6.56 ft (2 m) guide trough

Part No. 98-30

= 13 sections of 6.56 ft (2 m) glide bar

Part No. 92-01

Required number of installation sets:

= Number of guide trough components + 1
= 25 + 1 = 26

Part number of the installation sets

93-50-XXX

Example: 93-50-400 for 15.75" (400 mm) long profile rail.

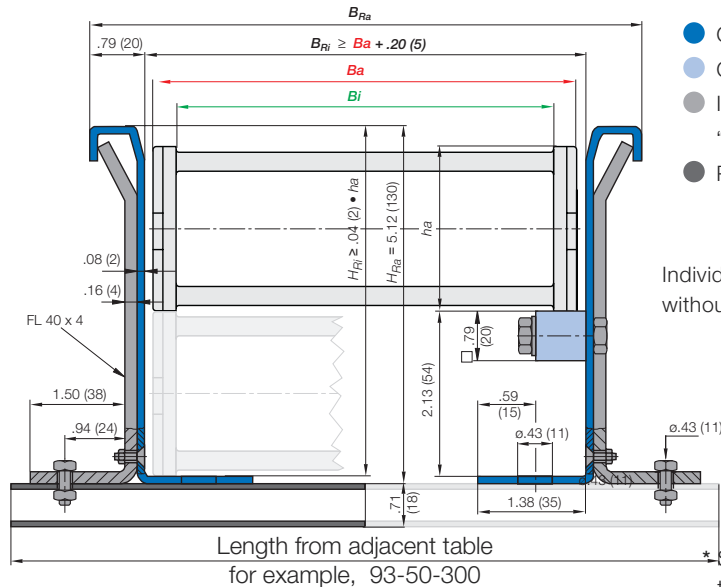


Left: Guide trough with glide bars

Right: Guide troughs without glide bars



Installation sets as section connectors



- Guide trough
- Glide bars
- Installation set "Basic"
- Profile rail

Individual attachment without profile rail

*Specialized guide trough available upon request

Standard length profile rail

PDF: www.igus.com/e-chain-pdfs
Specs/CAD/RFQ: www.igus.com/e-chains
RoHS info: www.igus.com/RoHS



E4-42
H4-42
R4-42



Energy Chain system® E4-1 Series E4-42/H4-42/R4-42

Price Index



Series E4-42



Series H4-42



Series R4-42

Special Options Available



Low noise version available
with special rubber pads



Cleanroom test upon request



ESD classification:
Electrically conductive
ESD/ATEX version upon request

Assembly Tips



Opening Energy Chains®: Remove cross-bars and clips - Insert screwdriver into the slot, push down, release by lever action



Remove lids/bottoms (Energy Tubes) - Insert screwdriver into the slot, release by lever action

Other Installation Methods

Vertical, hanging ≤ 328 ft (100 m)

Vertical, standing ≤ 19.69 ft (6 m)

Side-mounted, unsupp. ≤ 6.56 ft (2 m)

Rotary requires further calculation

Usage Guidelines



- If quiet operation is required
- If very high speeds and/or accelerations are required
- Long travels
- High additional loads



- When an extremely low vibration Energy Chain®/Energy Tube is required
➤ **Series E6-40/R6-40**
- When an economic one-sided snap-open Energy Chain®/Energy Tube is required
➤ **Series 3400/3450/3480/3500**

Features & Benefits

- 1 Wide, rounded plastic crossbars - cable friendly
- 2 Low-noise operation through integrated brake in the radial stop dog system
- 3 Hinged snap-open removable lids along the outer radius of the Energy Tube
- 4 Straight run through inner-/outer-link design
- 5 QuickLock Crossbar, 385-X-Q, available for faster assembly/disassembly
- 6 The tongue and groove design provides greater lateral stability
- 7 New Interior separation kit available
- 8 Crossbars are removable along both radii
- 9 15% more tensile strength (compared to the older E4 series), better unsupported length through improved stop dog system and vertical radial stops
- 10 Version NCST "without camber" simply by turning outer links without unnecessary rework



Also available without camber.
Add NCST to the end of the
part number.
Ex: E4-42-20-300NCST

Order Example: Complete Energy Chain®

Please indicate chain length or number of links. Example:

16.4 ft (5 m) **E4-42-20-300-0**

With 2 separators **382** assembled every 2nd link

1 Set **E4-420-20-12P**



Energy Chain®



Interior Separation



Mounting Bracket



Energy Chain system® E4-1 Series E4-42/H4-42/R4-42 Installation Dimensions

energy chain® configurator

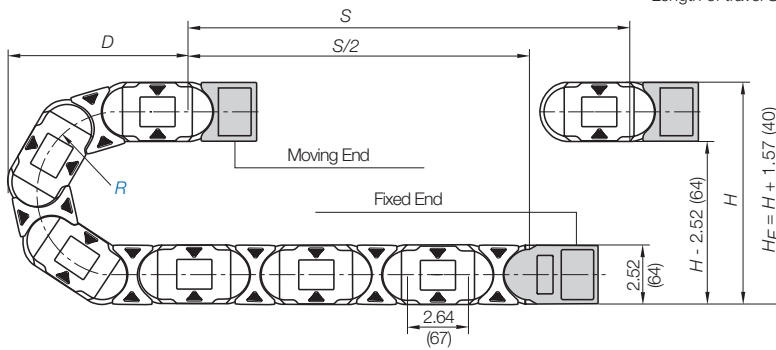
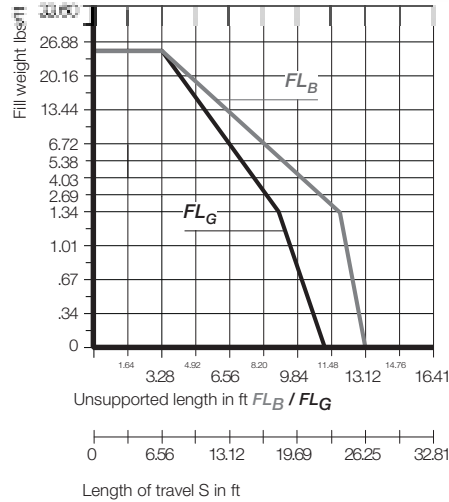
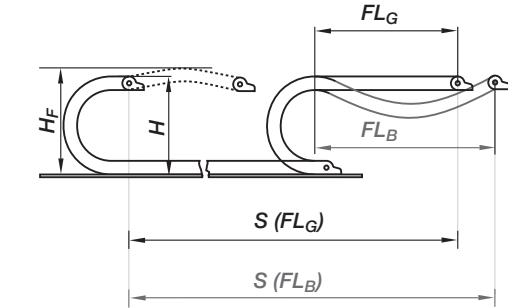


E4-42
H4-42
R4-42

Short travel, unsupported length

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

Further information ► Design, Chapter 1, main catalog



The required clearance height: $H_F = H + 1.57$ in. (40 mm) (with 2.02 lbs/ft (3 kg/m) fill weight).
Please consult igus® if space is particularly restricted.

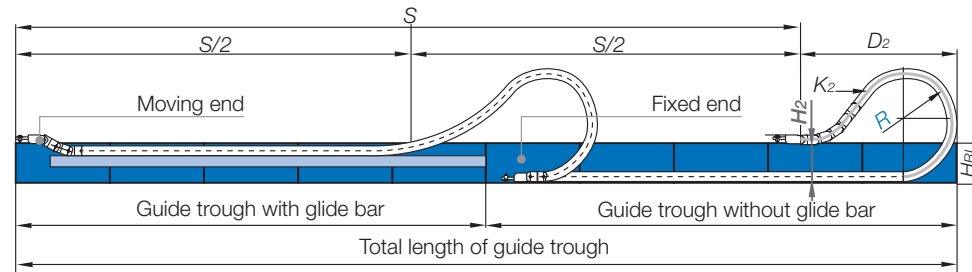
R	2.95 (075)	3.94 (100)	4.92 (125)	5.91 (150)	6.69 (175)	7.87 (200)	9.84 (250)	11.81 (300)	13.78 (350)
H $^{+0}_{-20}$	8.43 (214)	10.39 (264)	12.36 (314)	14.33 (364)	16.30 (414)	18.27 (464)	22.20 (564)	26.14 (664)	30.08 (764)
D	6.85 (174)	7.83 (199)	8.82 (224)	9.80 (249)	10.78 (274)	11.77 (299)	13.74 (349)	15.71 (399)	17.68 (449)
K	14.57 (370)	17.72 (450)	20.87 (530)	24.02 (610)	26.97 (685)	30.12 (765)	36.22 (920)	42.52 (1080)	48.62 (1235)

For long travels with lowered mounting height

Long travel lengths from 32.8 ft. (10 m) to max. 984 ft. (300 m)

For center mount applications:

Chain length: $= \frac{S}{2} + K_2$



R	2.95 (075)	3.94 (100)	4.92 (125)	5.91 (150)	6.69 (175)	7.87 (200)	9.84 (250)	11.81 (300)	13.78 (350)
H ₂	-	-	7.32 (186)	7.32 (186)	7.32 (186)	7.32 (186)	7.32 (186)	7.32 (186)	7.32 (186)
D ₂ +20	-	-	18.70 (475)	22.44 (570)	26.38 (670)	30.71 (780)	40.55 (1030)	45.28 (1150)	59.06 (1500)
K ₂	-	-	31.65 (804)	36.93 (938)	44.84 (1139)	52.76 (1340)	65.94 (1675)	76.50 (1943)	94.96 (2412)



For support of the lower run, see Chapter 9 for the Support Tray tool kit

Short Travels - Unsupported

Unsupported Energy Chains® feature positive camber over short travels. This must be accounted for when specifying the clearance height. Please refer to Installation dimensions for further details.

Legend

- S = Length of travel
- R = Bending radius
- H = Nominal clearance height
- D = Overlength Energy Chain® radius in final position
- $K = \pi \cdot R + \text{safety buffer}$
- H_F = Required clearance height
- H_{RI} = Trough inner height
- H₂ = *Mounting height
- D₂ = Overlength - long travels, gliding
- K₂ = *Add-on
- *If the mounting bracket location is set lower

Long Travels - Gliding



If the unsupported length is exceeded, the Energy Chain®/Tube must glide on itself. This requires a guide trough.

Design, Chapter 1, main catalog

Technical Data



Details of material properties

► Chapter 1

Speed / acceleration FL_G	max. 65.6 ft/s (20 m/s) / max. 656 ft/s ² (200 m/s ²)
Speed / acceleration FL_B	max. 9.84 ft/s (3 m/s) / max. 19.69 ft/s ² (6 m/s ²)
Gliding speed / acceleration (maximum)	max. 32.8 ft/s (10 m/s) / max. 164 ft/s ² (50 m/s ²)
Material - permitted temperature	igumid G / -40°F (-40°C) up to +248°F (+120°C)
Flammability Class, igumid G	VDE 0304 IIC UL94 HB

PDF: www.igus.com/e-chain-pdfs
Specs/CAD/RFO: www.igus.com/e-chains
RoHS info: www.igus.com/RoHS



E4-42
H4-42
R4-42



Energy Chain system® E4-1 Series E4-42/H4-42/R4-42 Product Range

energy chain® configurator

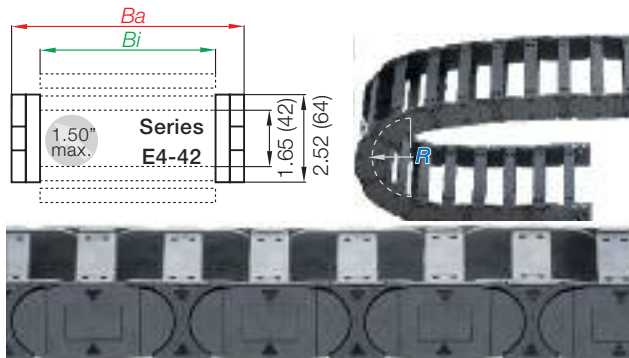
igus® Energy Chain
System®

Telephone 1-800-521-2747
Fax 1-401-438-7270

Internet: <http://www.igus.com>
email: sales@igus.com
QuickSpec: <http://www.igus.com/quickspec>

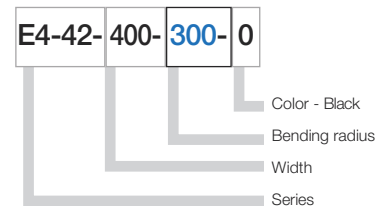
6.35

Series E4-42 - Energy Chain® with crossbars every link

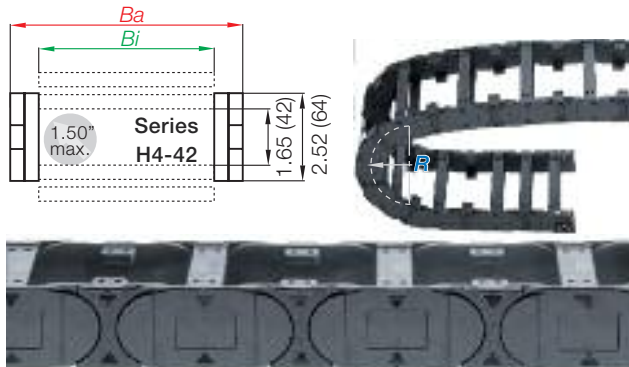


- Crossbars every link
- For use with rigid hydraulic hoses
- For particularly demanding applications
- Can be opened from both sides

Part Number Structure



Series H4-42 - Energy Chain® with crossbars every other link

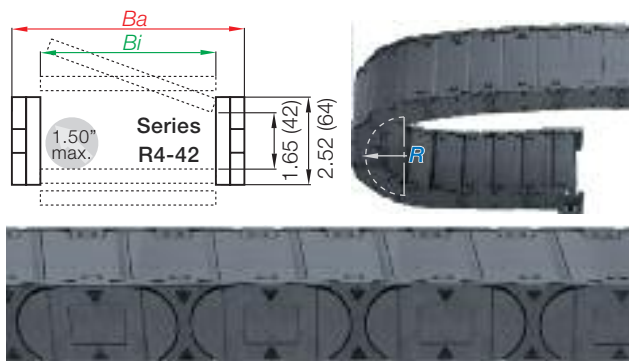


- Crossbars every other link
- Standard configuration
- For nearly every situation
- Can be opened from both sides
- Easy assembly
- Stable
- Cost-effective

Part Number Structure

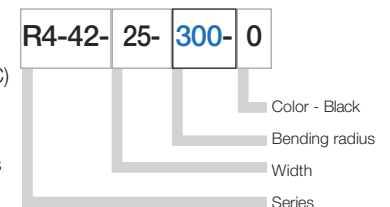


Series R4-42 - fully enclosed Energy Tube

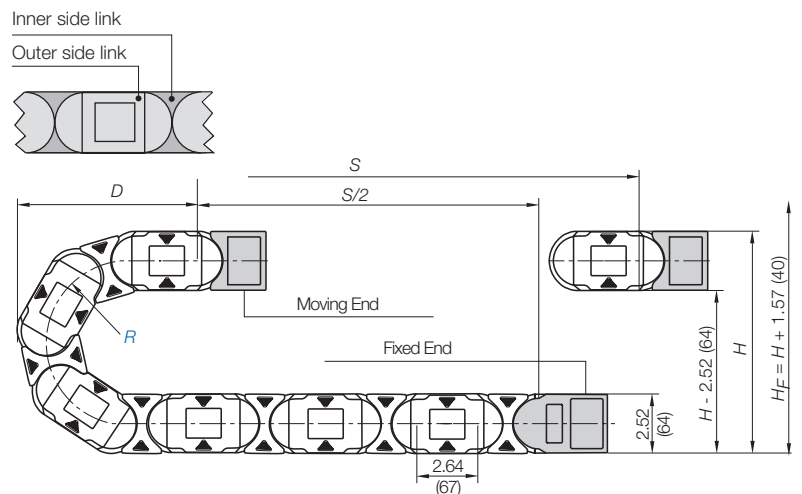
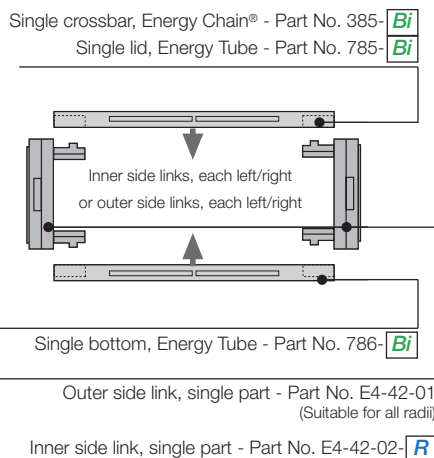


- Fully enclosed
- Excellent cable and hose protection against dirt
- Protection against hot chips up to 1652°F (900°C)
- Lids along inner radius are completely removable
- Lids along the outer radius are single-sided, snap open, hinged on one side as well as completely removable

Part Number Structure



Energy Chain® as separate parts, links and side plates



Energy Chain system® E4-1

Series E4-42/H4-42/R4-42

Product Range

energy chain® configurator



E4-42
H4-42
R4-42

Supplement part number with required radius. Example: E4-42-400-300-0
Pitch: 2.64 in. (67mm) per link, links/ft(m) = 4.57 (15)

Part Number					Weight				
Crossbars	Crossbars	Tube			<i>Bi</i>	<i>Ba</i>	E4-42	H4-42	R4-42
Every link	Every other	Version			in. (mm)	in. (mm)	lbs/ft (kg/m)	lbs/ft (kg/m)	lbs/ft (kg/m)
E4-42-05-	H4-42-05-	*R4-42-05-		-0	1.97 (50)	2.99 (76)	≈ 1.29 (1.92)	≈ 1.21 (1.80)	≈ 1.44 (2.15)
E4-42-06-	H4-42-06-			-0	2.68 (68)	3.70 (94)	≈ 1.36 (2.03)	≈ 1.25 (1.86)	–
E4-42-07-	H4-42-07-	R4-42-07-		-0	2.95 (75)	3.98 (101)	≈ 1.38 (2.06)	≈ 1.26 (1.87)	≈ 1.53 (2.28)
E4-42-087-	H4-42-087-			-0	3.43 (87)	4.49 (114)	≈ 1.42 (2.12)	≈ 1.28 (1.90)	≈ 1.62 (2.41)
E4-42-10-	H4-42-10-	R4-42-10-		-0	3.94 (100)	4.96 (126)	≈ 1.47 (2.19)	≈ 1.32 (1.96)	≈ 1.69 (2.52)
E4-42-11-	H4-42-11-	R4-42-11-		-0	4.25 (108)	5.28 (134)	≈ 1.50 (2.24)	≈ 1.32 (1.97)	≈ 1.73 (2.57)
E4-42-112-	H4-42-112-			-0	4.41 (112)	5.47 (139)	≈ 1.51 (2.25)	≈ 1.32 (1.97)	–
E4-42-12-	H4-42-12-	R4-42-12-		-0	4.92 (125)	5.94 (151)	≈ 1.57 (2.34)	≈ 1.35 (2.01)	≈ 1.83 (2.73)
E4-42-137-	H4-42-137-			-0	5.39 (137)	6.46 (164)	≈ 1.61 (2.39)	≈ 1.37 (2.04)	–
E4-42-15-	H4-42-15-	R4-42-15-		-0	5.91 (150)	6.93 (176)	≈ 1.65 (2.46)	≈ 1.39 (2.07)	≈ 2.00 (2.98)
E4-42-162-	H4-42-162-			-0	6.38 (162)	7.44 (189)	≈ 1.67 (2.48)	≈ 1.40 (2.09)	–
E4-42-17-	H4-42-17-	R4-42-17-		-0	6.61 (168)	7.64 (194)	≈ 1.71 (2.55)	≈ 1.42 (2.12)	≈ 2.12 (3.15)
E4-42-18-	H4-42-18-			-0	6.89 (175)	7.91 (201)	≈ 1.73 (2.57)	≈ 1.43 (2.13)	–
E4-42-187-	H4-42-187-			-0	7.36 (187)	8.43 (214)	≈ 1.75 (2.61)	≈ 1.44 (2.15)	–
E4-42-20-	H4-42-20-	R4-42-20-		-0	7.87 (200)	8.90 (226)	≈ 1.83 (2.72)	≈ 1.48 (2.20)	≈ 2.32 (3.45)
E4-42-212-	H4-42-212-			-0	8.35 (212)	9.41 (239)	≈ 1.85 (2.76)	≈ 1.49 (2.22)	–
E4-42-23-	H4-42-23-			-0	8.86 (225)	9.88 (251)	≈ 1.90 (2.84)	≈ 1.52 (2.26)	–
E4-42-237-	H4-42-237-			-0	9.33 (237)	10.39 (264)	≈ 1.93 (2.87)	≈ 1.53 (2.28)	–
E4-42-25-	H4-42-25-	R4-42-25-		-0	9.84 (250)	10.87 (276)	≈ 2.00 (2.98)	≈ 1.57 (2.33)	≈ 2.86 (4.25)
E4-42-262-	H4-42-262-			-0	10.31 (262)	11.38 (289)	≈ 2.05 (3.05)	≈ 1.59 (2.37)	–
E4-42-28	H4-42-28-			-0	10.83 (275)	11.85 (301)	≈ 2.09 (3.11)	≈ 1.61 (2.40)	–
E4-42-29-	H4-42-29-			-0	11.30 (287)	12.36 (314)	≈ 2.11 (3.14)	≈ 1.62 (2.41)	–
E4-42-30-	H4-42-30-	R4-42-30-		-0	11.81 (300)	12.83 (326)	≈ 2.18 (3.24)	≈ 1.65 (2.46)	≈ 3.29 (4.89)
E4-42-312-	H4-42-312-			-0	12.28 (312)	13.35 (339)	≈ 2.19 (3.26)	≈ 1.66 (2.47)	–
E4-42-325-	H4-42-325-			-0	12.79 (325)	13.82 (351)	≈ 2.24 (3.34)	≈ 1.69 (2.52)	–
E4-42-337-	H4-42-337-			-0	13.27 (337)	14.33 (364)	≈ 2.28 (3.40)	≈ 1.71 (2.54)	–
E4-42-350-	H4-42-350-			-0	13.78 (350)	14.80 (376)	≈ 2.41 (3.59)	≈ 1.77 (2.64)	–
E4-42-362-	H4-42-362-			-0	14.25 (362)	15.31 (389)	≈ 2.47 (3.67)	≈ 1.80 (2.68)	–
E4-42-375-	H4-42-375-			-0	14.76 (375)	15.83 (402)	≈ 2.51 (3.73)	≈ 1.82 (2.71)	–
E4-42-387-	H4-42-387-			-0	15.24 (387)	16.30 (414)	≈ 2.55 (3.79)	≈ 1.84 (2.74)	–
E4-42-400	H4-42-400-			-0	15.75 (400)	16.77 (426)	≈ 2.58 (3.84)	≈ 1.85 (2.76)	–

Choose from the radii below for all of the above sizes

Radius (mm) Example: E4-42-400-300-0

	075**	100**	125	150	175	200	250	300	350
R	2.95 (075)	3.94 (100)	4.92 (125)	5.91 (150)	6.89 (175)	7.87 (200)	9.84 (250)	11.81 (300)	13.78 (350)
H $\frac{0}{20}$	8.43 (214)	10.39 (264)	12.36 (314)	14.33 (364)	16.30 (414)	18.27 (464)	22.20 (564)	26.14 (664)	30.08 (764)
D	6.85 (174)	7.83 (199)	8.82 (224)	9.80 (249)	10.78 (274)	11.77 (299)	13.74 (349)	15.71 (399)	17.68 (449)
K	14.57 (370)	17.72 (450)	20.87 (530)	24.02 (610)	26.97 (685)	30.12 (765)	36.22 (920)	42.52 (1080)	48.62 (1235)

** This radius is not available for the R4-42 Series

*Removable lid only, no hinged option

0 = Standard color black.

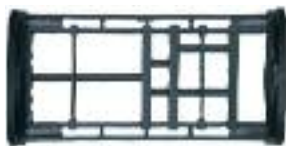
For other colors see Chapter 1, main catalog

For wider chains see page 44.

For large diameter hoses see page 44

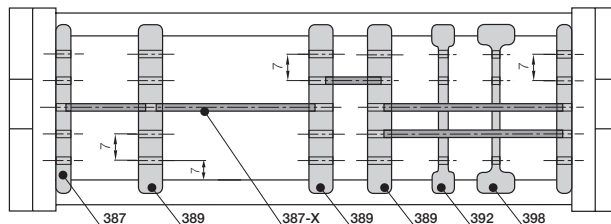
PDF: www.igus.com/e-chain-pdfs
Specs/CAD/RFO: www.igus.com/e-chains
RoHS info: www.igus.com/RoHS





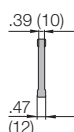
Shelves and Separators

Energy Chains® and Energy Tubes can be subdivided both vertically and horizontally using the various interior separation elements. ► **Design, Chapter 1, main catalog** for layout recommendations.



• Split separator T423 for Energy Chains®

This separator is ideal for subsequent shelving or the initial assembly of the Energy Chain. Fast assembly and disassembly using a hinge/push mechanism. Enhances flexibility.



Split separator (chain only)

Unassembled **Part No. T423**

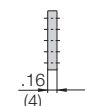
Assembled **Part No. T423M**

Split separator
T423, to be split
for shelf 386-X



• Side plates 386

This component is used to form the basic pattern of a shelf system.



Side Plate

Unassembled **Part No. 386**

Assembled **Part No. 387**

Side plate
386



• Vertical separator 388

This component is used to form the basic pattern of a shelf system.



Vertical Separator

Unassembled **Part No. 388**

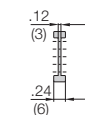
Assembled **Part No. 389**

Vertical
separator
388



• Closed Slotted separators 391

These are used for complex subdivisions. However, they cannot be retrofitted into an existing interior separation system without removing the shelves first.



Slotted Separators

Unassembled **Part No. 391**

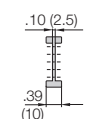
Assembled **Part No. 392**

Closed slotted
separator
391



• Open slotted separator 397

This separator can be retrofitted into an existing interior separation system without removing the shelves, as long as these shelves fit into the middle 3 slots only.



Slotted Separators, Open

Unassembled **Part No. 397**

Assembled **Part No. 398**

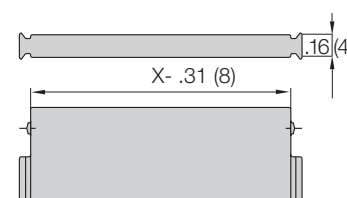
Open slotted
separator
397



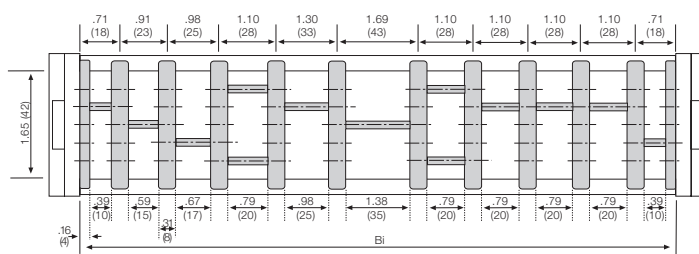
Width X in.	(mm)	Usable Width in.	(mm)	Part No. Unassembled	Part No. Assembled
.71	(18)	.39	(10)	386-18	387-18
.91	(23)	.59	(15)	386-23	387-23
.98	(25)	.67	(17)	386-25	387-25
1.10	(28)	.79	(20)	386-28	387-28
1.30	(33)	.98	(25)	386-33	387-33
1.69	(43)	1.38	(35)	386-43	387-43
1.97	(50)	1.65	(42)	386-50	387-50
2.13	(54)	1.81	(46)	386-54	387-54
2.44	(62)	2.13	(54)	386-62	387-62
2.95	(75)	2.64	(67)	386-75	387-75
3.43	(87)	3.12	(87)	386-87	387-87
3.94	(100)	3.62	(92)	386-100	387-100
4.25	(108)	3.94	(100)	386-108	387-108
4.92	(125)	4.61	(117)	386-125	387-125
5.91	(150)	5.59	(142)	386-150	387-150
6.89	(175)	6.57	(167)	386-175	387-175
7.87	(200)	7.56	(192)	386-200	387-200
8.19	(208)	7.87	(200)	386-208	387-208

Shelves 386-XX

These components form the basic pattern of a shelf system. Shelves of various widths can be arranged at 5 different heights in .28" (7mm) increments



The diagram below is for reference purposes only. Multiple configurations are possible. To create your e-chain shelving cross section please see our online e-chain configurator. Call 1-800-521-2747 for assistance and/or go to [igus.com](http://www.igus.com) click on the **Products** drop down menu, choose **Energy Chain Cable Carriers** and on the next drop down menu simply click on **e-chain Configurator**.



Energy Chain system® E4-1

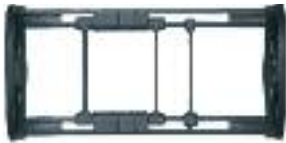
Series E4-42/H4-42/R4-42

Interior Separation

energy chain® configurator ►



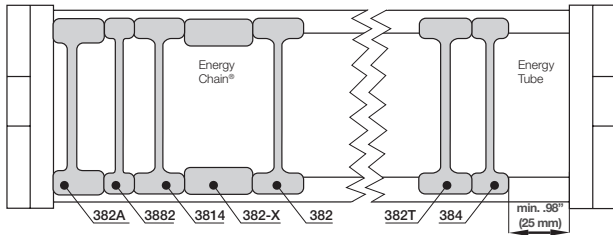
E4-42
H4-42
R4-42



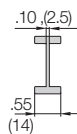
Vertical separators and spacers

Vertical separators are used if a vertical subdivision of the Energy Chain® interior is required. By standard, vertical separators are assembled every other Energy Chain® link.

NOTE: Observe a lateral spacing of at least .98 in. (25mm) for Energy Tubes



Vertical separator
380



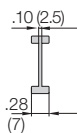
Separator
(chain/tube)

Unassembled **Part No. 380**

Assembled **Part No. 381**



Vertical separator
3881



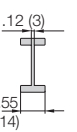
Separator
(chain only)

Unassembled **Part No. 3881**

Assembled **Part No. 3882**



Vertical separator
380T



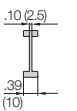
Vertical Separator
(tubes only)

Unassembled **Part No. 380T**

Assembled **Part No. 381T**



Vertical separator
383



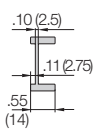
Separator
(chain only)

Unassembled **Part No. 383**

Assembled **Part No. 384**



Asymmetric separator
381A



Asymmetric separator
(chain only)

Unassembled **Part No. 381A**

Assembled **Part No. 382A**



Spacers
381-XX



Spacer
(chain only)

Unassembled **Part No. 381-XX**

Assembled **Part No. 382-XX**

XX = width of the spacer

Spacers available in the following sizes:

Part No. Unassembled	Part No. Assembled	in.	(mm)
381 -10	382 -10	.39"	(10)
381 -15	382 -15	.59"	(15)
381 -20	382 -20	.79"	(20)

Standard separator 380 for Energy Chains® and Energy Tubes

This separator offers safe stability due to its wide base design, also when used with thick cables or hoses.

Vertical separator 3881 for Energy Chains®

This separator features a narrow 7mm base for applications where a large number of small cables need to be individually separated.

Locking separator 380T for Energy Tubes

It clamps to the fixed radius and remains free along the other radius to facilitate lid removal. When installing please ensure they are identically aligned.

Vertical separator 383 for Energy Chains®

This separator features an increased retention force for applications exposed to very high humidity or extreme loads. It features asymmetric claws for the crossbar which results in the increased retention force.

Asymmetrical separator 381A for Energy Chains®

This separator features an (14mm) base. It can be used in combinations between spacers of different widths and vertical separators in side mounted applications.

NOTE ON SPACERS

Vertical separators are adjustable, but can be fixed in position by means of a spacer. Spacers are most often necessary for side mounted applications. The available inner height is reduced by .08" (2mm) **per spacer** (for example if one spacer is placed on either side of the separator, the overall inner height is reduced by .16" (4mm). To avoid this, place the spacers on the **outside** of the opening crossbar (not for long travels).

PDF: www.igus.com/e-chain-pdfs
Specs/CAD/RFQ: www.igus.com/e-chains
RoHS info: www.igus.com/RoHS



Energy Chain system® E4-1

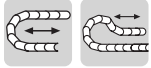
Series E4-42/H4-42/R4-42

Mounting Brackets

energy chain® configurator

igus®

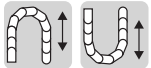
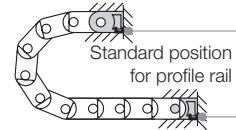
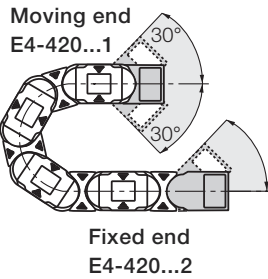
E4-42
H4-42
R4-42



Standard

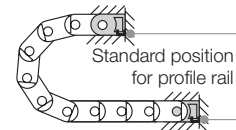
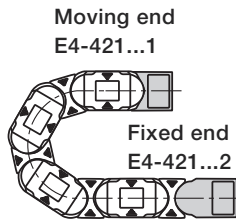
Option 1: pivoting

- Recommended for unsupported and gliding applications
- Attachment capability on all sides
- Bolted connection outside of chain cross-section
- Space restricted conditions
- Corrosion resistant



Option 2: locking

- Profile rail option
- Universal use
- Corrosion resistant
- Vertical hanging/standing travels
- Extreme accelerations



Part Number Structure

E4-420-07-12-P

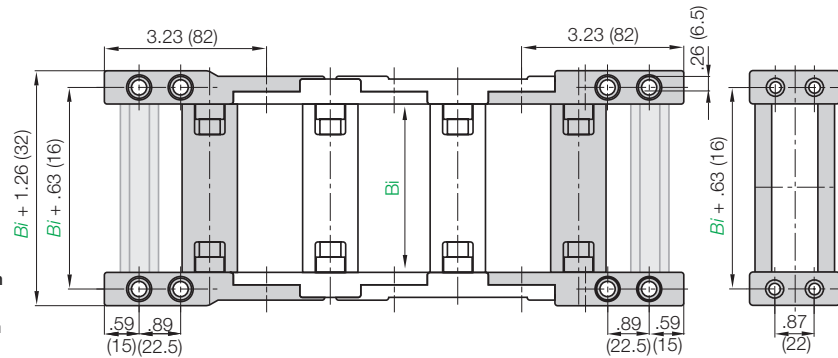
With Profile Rail

Complete Set

Width

E4-420 = Pivoting for chain
R4-420 = Pivoting for tube

E4-421 = Locking for chain
R4-421 = Locking for tube



Due to the design of the E4-42 series chains, please note the following when ordering brackets:

Even number of links = full set, part number ending in -12; Odd number of links = 2 pieces, part number ending in -2

Part number examples are shown for pivoting brackets for Energy Chain.

For locking brackets change part number to 421

Part No. Full Set (pivoting)

Series E4-42 or H4-42

E4-420-Width-12

Part No. Full Set (pivoting)

with profile rail

Series E4-42 or H4-42

E4-420-Width-12P

Part No. Full Set (pivoting)

Tube Series R4-42

R4-420-Width-12

Part No. Full Set (pivoting)

with Profile Rail

Tube Series R4-42

R4-420-Width-12P

Width	Part No. Full Set chain/tube		With Profile Rail	Bi in. (mm)
	Pivoting	Locking		
-05*	E4-420/R4-420	E4-421/R4-421	-05-12	P 1.97 (50)
-06	E4-420	E4-421	-06-12	P 2.68 (68)
-07	E4-420/R4-420	E4-421/R4-421	-07-12	P 2.95 (75)
-087	E4-420	E4-421	-087-12	P 3.43 (87)
-10	E4-420/R4-420	E4-421/R4-421	-10-12	P 3.94 (100)
-11	E4-420/R4-420	E4-421/R4-421	-11-12	P 4.25 (108)
-112	E4-420	E4-421	-112-12	P 4.41 (112)
-12	E4-420/R4-420	E4-421/R4-421	-12-12	P 4.92 (125)
-137	E4-420	E4-421	-137-12	P 5.39 (137)
-15	E4-420/R4-420	E4-421/R4-421	-15-12	P 5.91 (150)
-162	E4-420	E4-421	-162-12	P 6.38 (162)
-17	E4-420/R4-420	E4-421/R4-421	-17-12	P 6.61 (168)
-18	E4-420	E4-421	-18-12	P 6.89 (175)
-187	E4-420	E4-421	-187-12	P 7.36 (187)
-20	E4-420/R4-420	E4-421/R4-421	-20-12	P 7.87 (200)
-212	E4-420	E4-421	-212-12	P 8.35 (212)

Width	Part No. Full Set chain/tube		With Profile Rail	Bi in. (mm)
	Pivoting	Locking		
-23	E4-420	E4-421	-23-12	P 8.86 (225)
-237	E4-420	E4-421	-237-12	P 9.33 (237)
-25	E4-420/R4-420	E4-421/R4-421	-25-12	P 9.84 (250)
-262	E4-420	E4-421	-262-12	P 10.31 (262)
-28	E4-420	E4-421	-28-12	P 10.83 (275)
-29	E4-420	E4-421	-29-12	P 11.30 (287)
-30	E4-420/R4-420	E4-421/R4-421	-30-12	P 11.81 (300)
-312	E4-420	E4-421	-312-12	P 12.28 (312)
-325	E4-420	E4-421	-325-12	P 12.79 (325)
-337	E4-420	E4-421	-337-12	P 13.27 (337)
-350	E4-420	E4-421	-350-12	P 13.78 (350)
-362	E4-420	E4-421	-362-12	P 14.25 (362)
-375	E4-420	E4-421	-375-12	P 14.76 (375)
-387	E4-420	E4-421	-387-12	P 15.24 (387)
-400	E4-420	E4-421	-400-12	P 15.75 (400)

PDF: www.igus.com/e-chain-pdfs
Specs/CAD/RFO: www.igus.com/e-chains
RoHS info: www.igus.com/RoHS



Chainfix clamps for
the profile rail

igus® Chainfix strain relief elements are available in either steel or stainless steel. They can be adjusted with a hexagon socket and are available in single, double and triple configurations.

Part No. Single Clamp		Part No. Double Clamp		Part No. Triple Clamp		Cable ø	
Steel	Stainless	Steel	Stainless	Steel	Stainless	in.	(mm)
CFX12-1M	CFX12-1E	CFX12-2	CFX12-2E	CFX12-3	–	.24 - .47	(06 - 12)
CFX14-1M	CFX14-1E	CFX14-2	CFX14-2E	CFX14-3	–	.47 - .55	(12 - 14)
CFX16-1M	CFX16-1E	CFX16-2	CFX16-2E	CFX16-3	–	.55 - .63	(14 - 16)
CFX18-1M	CFX18-1E	CFX18-2	CFX18-2E	CFX18-3	–	.63 - .71	(16 - 18)
CFX20-1M	CFX20-1E	CFX20-2	CFX20-2E	CFX20-3	–	.71 - .79	(18 - 20)
CFX22-1M	CFX22-1E	CFX22-2	CFX22-2E	CFX22-3	–	.79 - .87	(20 - 22)
CFX26-1M	CFX26-1E	CFX26-2	CFX26-2E	–	–	.87 - 1.02	(22 - 26)
CFX30-1M	CFX30-1E	CFX30-2	CFX30-2E	–	–	1.02 - 1.18	(26 - 30)
CFX34-1M	CFX34-1E	CFX34-2	CFX34-2E	–	–	1.18 - 1.34	(30 - 34)
CFX38-1M	CFX38-1E	–	–	–	–	1.34 - 1.50	(34 - 38)
CFX42-1M	CFX42-1E	–	–	–	–	1.50 - 1.65	(38 - 42)

For more information please refer to strain relief section of Chapter 10 in main catalog.

Chainfix Clip

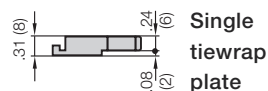
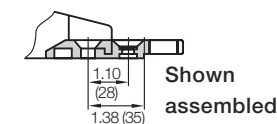


Modular snap-on strain relief device

Chainfix clips are available for cable diameters ranging from .16" (4mm) to .94" (24 mm). They are for assembly on KMA mounting brackets, clip-on strain relief for cross-bars as well as profile rails. Quick assembly without the use of tools. **For more information please refer to strain relief section of Chapter 10 in main catalog.**

Cable ø	Part No.	Part No.
in.	Clamp	Bottom
(mm)		
.16-.31	CFC-08-M	CFC-08-C
.31-.47	CFC-12-M	CFC-12-C
.47-.63	CFC-16-M	CFC-16-C
.63-.79	CFC-20-M	CFC-20-C
.79-.94	CFC-24-M	CFC-24-C

Tiewrap Plates

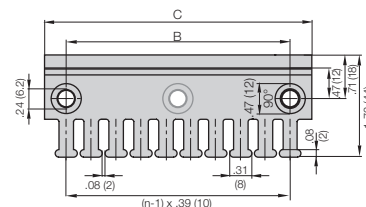


Option 1:

Tiewrap plates as an individual part

Available as an individual component, can be fixed onto a mounting bracket with the use of a profile rail.

Tiewrap Plate	n Number of Teeth	C Overall Width in. (mm)	B Bore Width in. (mm)	Center Bore
3050-ZB	5	1.97 (50)	1.18 (30)	no
3075-ZB	7	2.95 (75)	2.16 (55)	no
3100-ZB	10	3.94 (100)	3.15 (80)	no
3115-ZB	11	4.53 (115)	3.74 (95)	no
3125-ZB	12	4.92 (125)	4.13 (105)	no
3150-ZB	15	5.91 (150)	5.12 (130)	no
3175-ZB	17	6.89 (175)	6.10 (155)	no
3200-ZB	20	7.87 (200)	7.09 (180)	yes
3225-ZB	22	8.86 (225)	8.07 (205)	yes
3250-ZB	25	9.84 (250)	9.06 (230)	yes



If used with KMA brackets with profile rail please add "KMA" to the end of the part number.

Example: 3050-ZBKMA

For more information please refer to strain relief section of Chapter 10 in main catalog.



Option 2:

Clip-on Tiewrap plates

Available as a clip-on tiewrap plate without the use of bolts. They are inserted and removed with a screwdriver used as a lever. Clip-on tiewrap plates are also available as an attachment to the opening crossbars.

Part No.	Number of Teeth	Width of Strain Relief in. (mm)
3050-ZC	5	1.97 (50)
3075-ZC	7	2.95 (75)

For more information please refer to strain relief section of Chapter 10 in main catalog.

Energy Chain system® E4-1

Series E4-42/H4-42/R4-42

Guide Trough

energy chain® configurator

igus®

E4-42
H4-42
R4-42

Width of Crossbar
E4-42-05-200-0

	B_{Ri}	Installation Part No.
-05	3.19 (81)	93-50-200
-06	3.90 (99)	93-50-225
-07	4.17 (106)	93-50-225
-087	4.69 (119)	93-50-250
-10	5.16 (131)	93-50-250
-11	5.47 (139)	93-50-250
-112	5.67 (144)	93-50-275
-12	6.14 (156)	93-50-275
-137	6.65 (169)	93-50-300
-15	7.12 (181)	93-50-300
-162	7.64 (194)	93-50-325
-17	7.83 (199)	93-50-325
-18	8.11 (206)	93-50-325
-187	8.62 (219)	93-50-350
-20	9.09 (231)	93-50-350
-212	9.61 (244)	93-50-375
-23	10.08 (256)	93-50-375
-237	10.59 (269)	93-50-400
-25	11.06 (281)	93-50-400
-262	11.57 (294)	93-50-425
-28	12.05 (306)	93-50-425
-29	12.56 (319)	93-50-450
-30	13.03 (331)	93-50-450
-312	13.54 (344)	93-50-475
-325	14.01 (356)	93-50-475
-337	14.52 (369)	93-50-500
-350	15.00 (381)	93-50-500
-362	15.51 (394)	93-50-525
-375	16.02 (407)	93-50-525
-387	16.50 (419)	93-50-550
-400	16.97 (431)	93-50-550

Guide troughs are used with applications where the upper run of the Energy Chain® glides on the lower run. If using igus® steel guide troughs, the following components are required:

- Full travel length of guide trough
Part No. 93-30
- 1/2 travel length of glide bars
Part No. 93-01
- Installation sets as end connectors
Part No. 93-50-XX

-XX indicates the length of the profile rail on which the guide trough is mounted. The values and part numbers are specified in the table below. The standard length of the trough components and glide bars is 6.56 ft (2 m). The required overall length of the guide trough directly correlates to the length of travel

Example:

Length of travel 164 ft (50 m)

Center mounted

Required guide troughs:

164 ft (50 m) guide trough,
82 ft (25 m) glide bar

= 25 sections of 6.56 ft (2 m) guide trough

Part No. 93-30

= 13 sections of 6.56 ft (2 m) glide bar

Part No. 93-01

Required number of installation sets:

= Number of guide trough components + 1

= 25 + 1 = 26

Part No. of the installation sets **93-50-XXX**

Example: 93-50-400 for 15.75 (400 mm) long profile rail

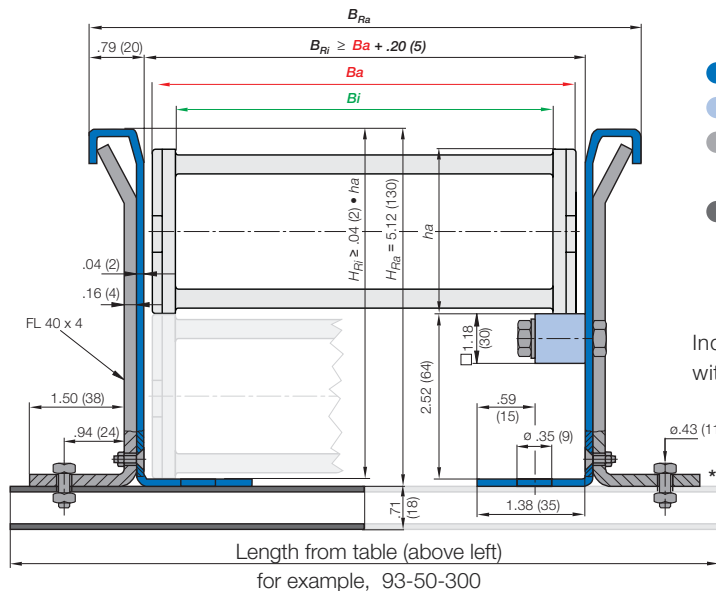


Left: Guide trough with glide bars

Right: Guide troughs without glide bars



Installation sets as section connectors



- Guide trough
- Glide bars
- Installation set "Basic"
- Profile rail

Individual attachment without profile rail

* Specialized guide trough available upon request

Standard length profile rail

PDF: www.igus.com/e-chain-pdfs
Specs/CAD/RFO: www.igus.com/e-chains
RoHS info: www.igus.com/RoHS



E4-56
H4-56
R4-56



Energy Chain system® E4-1 Series E4-56/H4-56/R4-56

energy chain® configurator

Price Index



Series E4-56



Series H4-56



Series R4-56

Special Options Available



Low noise version available
with special rubber pads



Cleanroom test upon request



ESD classification:
Electrically conductive
ESD/ATEX version upon request

Assembly Tips



Opening Energy Chains®: Remove crossbars and clips - Insert screwdriver into the slot, push down, release by lever action



Remove lids/bottoms (Energy Tubes) - Insert screwdriver into the slot, release by lever action

Other Installation Methods

Vertical, hanging ≤ 328 ft (100 m)

Vertical, standing ≤ 19.69 ft (6 m)

Side-mounted, unsupp. ≤ 8.20 ft (2.5 m)

Rotary requires further calculation

Usage Guidelines



- If quiet operation is required
- If very high speeds and/or accelerations are required
- Long travels
- High additional loads



- When an extremely low vibration Energy Chain®/Energy Tube is required
➤ **Series E6-52**
- When an economic one-sided snap-open Energy Chain®/Energy Tube is required
➤ **Series 14040/14140/R18840**

Features & Benefits

- 1 Wide, rounded plastic crossbars - cable friendly
- 2 Low-noise operation through integrated brake in the radial stop dog system
- 3 Hinged snap-open removable lids along the outer radius of the Energy Tube
- 4 Straight run through inner-/outer-link design
- 5 The tongue and groove design provides greater lateral stability
- 6 QuickLock Crossbar, 450-X-Q, available for faster assembly/disassembly
- 7 New Interior separation kit available
- 8 Crossbars are removable along both radii
- 9 15% more tensile strength (compared to the older E4 series), better unsupported length through improved stop dog system and vertical radial stops
- 10 Version NCST "without camber" simply by turning outer links without unnecessary rework



Also available without camber.
Add NCST to the end of the
part number.
Ex: E4-56-30-300NCST

Order Example: Complete Energy Chain®

Please indicate chain length or number of links. Example:

9.84 ft (3 m) **E4-56-30-300-0**

With 2 separators **411** assembled every 2nd link

1 Set **E4-560-30-12P**



Energy Chain®



Interior Separation



Mounting Bracket

Energy Chain system® E4-1 Series E4-56/H4-56/R4-56 Installation Dimensions

energy chain® configurator

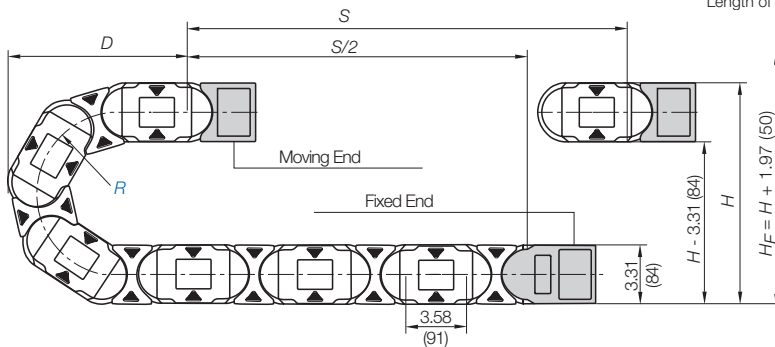
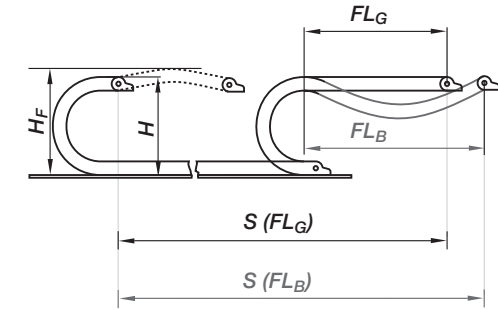
igus®

E4-56
H4-56
R4-56

Short travel, unsupported length

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

Further information ► Design, Chapter 1, main catalog

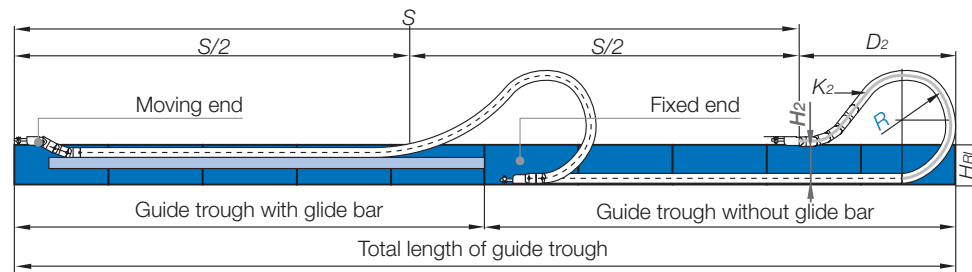


The required clearance height: $H_F = H + 1.96$ in. (50 mm) (with 2.02 lbs/ft (3 kg/m) fill weight. Please consult igus® if space is particularly restricted.

R	5.31 (135)	5.91 (150)	6.89 (175)	7.87 (200)	9.45 (240)	9.84 (250)	11.81 (300)	13.78 (350)	15.75 (400)	17.72 (450)	19.68 (500)
H_{25}^*	13.94 (354)	15.12 (384)	17.09 (434)	19.06 (484)	22.20 (564)	22.99 (584)	26.93 (684)	30.87 (784)	34.80 (884)	38.74 (984)	42.68 (1084)
D	10.55 (268)	11.14 (283)	12.13 (308)	13.11 (333)	14.69 (373)	15.08 (383)	17.05 (433)	19.02 (483)	20.98 (533)	22.95 (583)	24.92 (633)
K	24.02 (610)	25.79 (655)	28.94 (735)	32.09 (815)	37.01 (940)	38.19 (970)	44.29 (1125)	50.59 (1285)	56.69 (1440)	62.99 (1600)	69.09 (1755)

For long travels with lowered mounting height

Long travel lengths from 32.8 ft.(10m) to max. 1,312.4 ft. (400m)



For center mount applications:

Chain length = $\frac{S}{2} + K_2$

R	5.31 (135)	5.91 (150)	6.89 (175)	7.87 (200)	9.45 (240)	9.84 (250)	11.81 (300)	13.78 (350)	15.75 (400)	17.72 (450)	19.68 (500)
H_2	13.94 (354)	10.47 (266)	10.47 (266)	10.47 (266)	10.47 (266)	10.47 (266)	10.47 (266)	10.47 (266)	10.47 (266)	10.47 (266)	10.47 (266)
D_2	10.55 (268)	17.72 (450)	22.83 (580)	27.95 (710)	35.43 (900)	38.58 (980)	46.46 (1180)	56.69 (1440)	60.24 (1530)	66.93 (1700)	72.83 (1850)
K_2	24.02 (610)	32.24 (819)	42.99 (1092)	50.16 (1274)	60.91 (1547)	64.49 (1638)	78.82 (2002)	89.57 (2275)	100.31 (2548)	114.64 (2912)	128.98 (3276)



For support of the lower run, see Chapter 9 for the Support Tray tool kit

Speed / acceleration FL_G	max. 65.6 ft/s (20 m/s) / max. 656 ft/s² (200 m/s²)
Speed / acceleration FL_B	max. 9.84 ft/s (3 m/s) / max. 19.69 ft/s² (6 m/s²)
Gliding speed / acceleration (maximum)	max. 32.8 ft/s (10 m/s) / max. 164 ft/s² (50 m/s²)
Material - permitted temperature	igumid G / -40°F (-40°C) up to +248°F (+120°C)
Flammability Class, igumid G	VDE 0304 IIC UL94 HB

Short Travels - Unsupported

Unsupported Energy Chains® feature positive camber over short travels. This must be accounted for when specifying the clearance height. Please refer to **Installation dimensions** for further details.

Legend

- S = Length of travel
- R = Bending radius
- H = Nominal clearance height
- D = Overlength Energy Chain® radius in final position
- $K = \pi \cdot R + \text{safety buffer}$
- H_F = Required clearance height
- H_{R1} = Trough inner height
- H_2 = *Mounting height
- D_2 = Overlength - long travels, gliding
- K_2 = *Add-on
- *If the mounting bracket location is set lower

Long Travels - Gliding



If the unsupported length is exceeded, the Energy Chain®/Tube must glide on itself. This requires a guide trough.

Design, Chapter 1, main catalog

Technical Data



Details of material properties

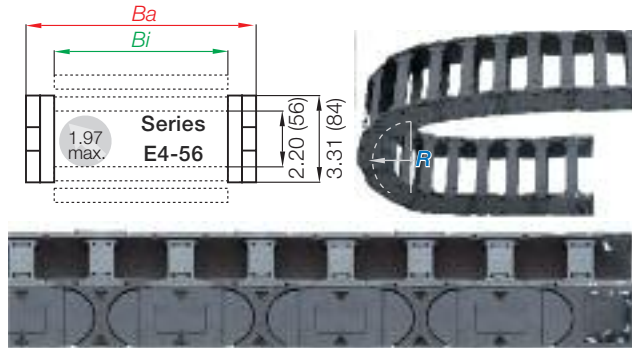
► Chapter 1, main catalog

PDF: www.igus.com/e-chain-pdfs
Specs/CAD/RFO: www.igus.com/e-chains
RoHS info: www.igus.com/RoHS

2.20

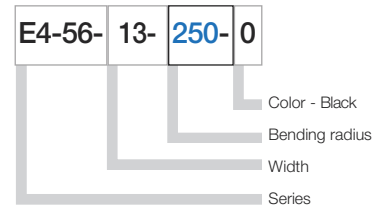
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Series E4-56 - Energy Chain® with crossbars every link

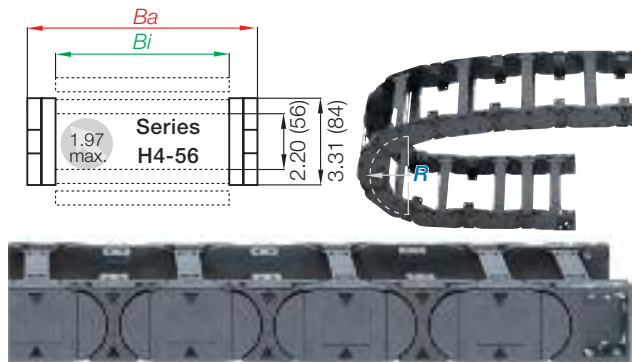


- Crossbars every link
- For use with rigid hydraulic hoses
- For particularly demanding applications
- Can be opened from both sides

Part Number Structure

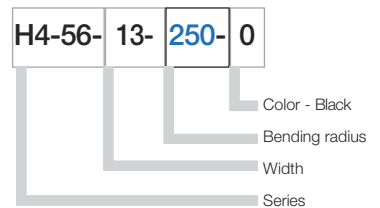


Series H4-56 - Energy Chain® with crossbars every other link

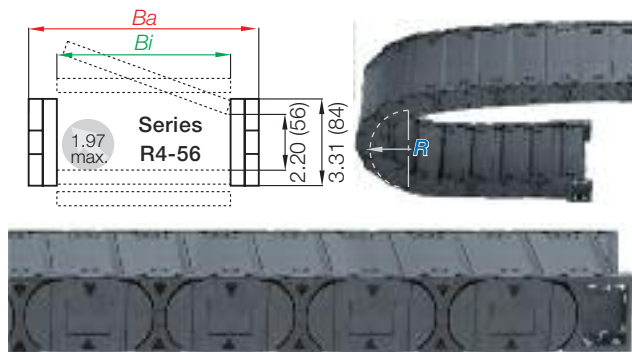


- Crossbars every other link
- Standard configuration
- For nearly every situation
- Can be opened from both sides
- Easy assembly
- Stable
- Cost-effective

Part Number Structure

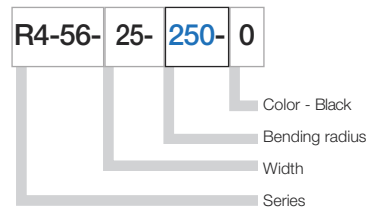


Series R4-56 - fully enclosed Energy Tube

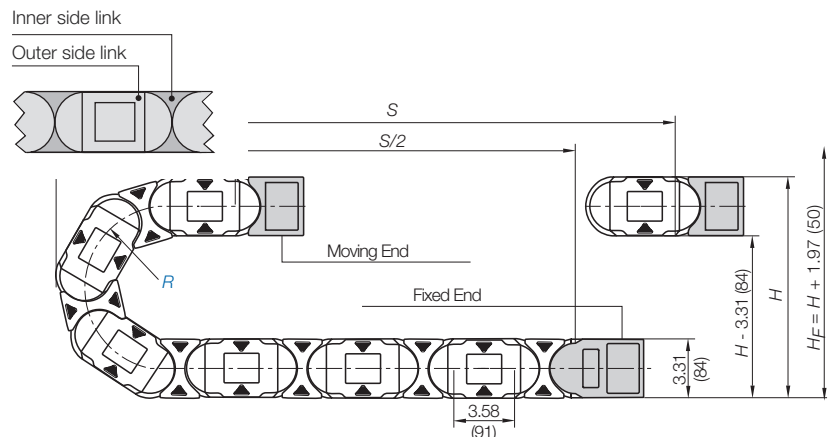
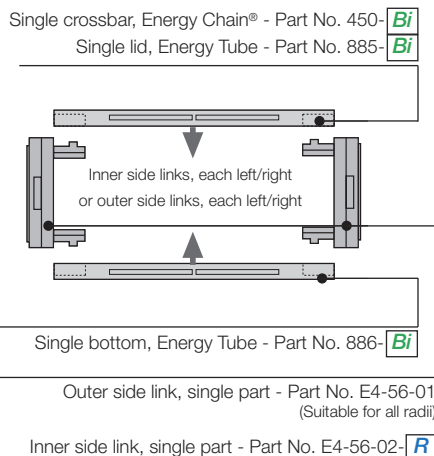


- Fully enclosed
- Excellent cable and hose protection against dirt
- Protection against hot chips up to 1,562°F (850°C)
- Lids along inner radius are completely removable
- Lids along the outer radius are single-sided, snap open, hinged on one side as well as completely removable

Part Number Structure



Energy Chain® as separate parts, links and side plates



Energy Chain system® E4-1

Series E4-56/H4-56/R4-56

Product Range

energy chain® configurator



E4-56
H4-56
R4-56

Part Number			Weight					
Crossbars	Crossbars	Tube						
Every link	Every other	Version		<i>Bi</i>	<i>Ba</i>	E4-56	H4-56	R4-56
				in. (mm)	in. (mm)	lbs/ft (kg/m)	lbs/ft (kg/m)	lbs/ft (kg/m)
E4-56-05-	H4-56-05-		-0	1.97 (50)	3.31 (84)	≈ 2.22 (3.30)	≈ 2.12 (3.16)	–
E4-56-06-	H4-56-06-		-0	2.56 (65)	3.90 (99)	≈ 2.28 (3.39)	≈ 2.15 (3.20)	–
E4-56-07-	H4-56-07-	R4-56-07-	-0*	2.95 (75)	4.29 (109)	≈ 2.33 (3.46)	≈ 2.18 (3.24)	≈ 2.63 (3.91)
E4-56-08-	H4-56-08-		-0	3.43 (87)	4.76 (121)	≈ 2.38 (3.54)	≈ 2.20 (3.28)	–
E4-56-10-	H4-56-10-	R4-56-10-	-0	3.94 (100)	5.28 (134)	≈ 2.44 (3.63)	≈ 2.23 (3.32)	≈ 2.82 (4.20)
E4-56-11-	H4-56-11-	-	-0	4.41 (112)	5.79 (147)	≈ 2.52 (3.75)	≈ 2.27 (3.38)	–
E4-56-12-	H4-56-12-	R4-56-12-	-0	4.92 (125)	6.26 (159)	≈ 2.57 (3.83)	≈ 2.30 (3.42)	≈ 3.06 (4.56)
E4-56-13-	H4-56-13-		-0	5.39 (137)	6.77 (172)	≈ 2.66 (3.96)	≈ 2.35 (3.49)	–
E4-56-15-	H4-56-15-	R4-56-15-	-0	5.91 (150)	7.24 (184)	≈ 2.69 (4.00)	≈ 2.36 (3.51)	≈ 3.32 (4.94)
E4-56-16-	H4-56-16-		-0	6.38 (162)	7.76 (197)	≈ 2.76 (4.11)	≈ 2.39 (3.56)	–
E4-56-17-	H4-56-17-	R4-56-17-	-0	6.89 (175)	8.23 (209)	≈ 2.86 (4.25)	≈ 2.44 (3.63)	≈ 3.53 (5.25)
E4-56-18-	H4-56-18-		-0	7.36 (187)	8.74 (222)	≈ 2.93 (4.36)	≈ 2.48 (3.69)	–
E4-56-20-	H4-56-20-	R4-56-20-	-0	7.87 (200)	9.21 (234)	≈ 2.96 (4.41)	≈ 2.49 (3.71)	≈ 3.74 (5.56)
E4-56-21-	H4-56-21-		-0	8.35 (212)	9.72 (247)	≈ 3.01 (4.48)	≈ 2.52 (3.75)	–
E4-56-22-	H4-56-22-		-0	8.86 (225)	10.20 (259)	≈ 3.06 (4.55)	≈ 2.54 (3.78)	–
E4-56-23-	H4-56-23-		-0	9.33 (237)	10.71 (272)	≈ 3.13 (4.66)	≈ 2.58 (3.84)	–
E4-56-25-	H4-56-25-	R4-56-25-	-0	9.84 (250)	11.18 (284)	≈ 3.21 (4.77)	≈ 2.61 (3.89)	≈ 4.23 (6.29)
E4-56-26-	H4-56-26-		-0	10.31 (262)	11.69 (297)	≈ 3.27 (4.87)	≈ 2.65 (3.94)	–
E4-56-27-	H4-56-27-	R4-56-27-	-0	10.83 (275)	12.17 (309)	≈ 3.34 (4.97)	≈ 2.68 (3.99)	≈ 4.47 (6.65)
E4-56-28-	H4-56-28-		-0	11.30 (287)	12.68 (322)	≈ 3.38 (5.03)	≈ 2.70 (4.02)	–
E4-56-30-	H4-56-30-	R4-56-30-	-0	11.81 (300)	13.15 (334)	≈ 3.48 (5.18)	≈ 2.76 (4.10)	≈ 4.67 (6.95)
E4-56-31-	H4-56-31-		-0	12.28 (312)	13.66 (347)	≈ 3.50 (5.21)	≈ 2.76 (4.11)	–
E4-56-32-	H4-56-32-		-0	12.79 (325)	14.13 (359)	≈ 3.57 (5.32)	≈ 2.80 (4.17)	–
E4-56-33-	H4-56-33-		-0	13.27 (337)	14.65 (372)	≈ 3.66 (5.44)	≈ 2.84 (4.23)	–
E4-56-35-	H4-56-35-	R4-56-35-	-0	13.78 (350)	15.12 (384)	≈ 3.79 (5.64)	≈ 2.91 (4.33)	≈ 5.14 (7.65)
E4-56-36-	H4-56-36-		-0	14.25 (362)	15.63 (397)	≈ 3.73 (5.55)	≈ 2.88 (4.28)	–
E4-56-37-	H4-56-37-		-0	14.76 (375)	16.10 (409)	≈ 3.80 (5.65)	≈ 2.91 (4.33)	–
E4-56-38-	H4-56-38-		-0	15.24 (387)	16.61 (422)	≈ 3.87 (5.76)	≈ 2.95 (4.39)	–
E4-56-40-	H4-56-40-	R4-56-40-	-0	15.75 (400)	17.09 (434)	≈ 4.05 (6.03)	≈ 3.04 (4.52)	≈ 5.81 (8.65)
E4-56-41-	H4-56-41-		-0	16.22 (412)	17.60 (447)	≈ 4.00 (5.96)	≈ 3.01 (4.48)	–
E4-56-42-	H4-56-42-		-0	16.73 (425)	18.07 (459)	≈ 4.19 (6.23)	≈ 3.11 (4.63)	–
E4-56-43-	H4-56-43-		-0	17.20 (437)	18.58 (472)	≈ 4.09 (6.09)	≈ 3.06 (4.55)	–
E4-56-45-	H4-56-45-		-0	17.72 (450)	19.06 (484)	≈ 4.31 (6.42)	≈ 3.17 (4.72)	–
E4-56-46-	H4-56-46-	R4-56-46-	-0	18.19 (462)	19.57 (497)	≈ 4.28 (6.37)	≈ 3.15 (4.69)	≈ 6.13 (9.12)
E4-56-47-	H4-56-47-		-0	18.70 (475)	20.04 (509)	≈ 4.31 (6.41)	≈ 3.16 (4.71)	–
E4-56-48-	H4-56-48-		-0	19.17 (487)	20.55 (522)	≈ 4.48 (6.66)	≈ 3.25 (4.84)	–
E4-56-50-	H4-56-50-		-0	19.69 (500)	21.02 (534)	≈ 4.54 (6.76)	≈ 3.29 (4.89)	–
E4-56-51-	H4-56-51-		-0	20.16 (512)	21.54 (547)	≈ 4.48 (6.67)	≈ 3.25 (4.84)	–
E4-56-52-	H4-56-52-		-0	20.67 (525)	22.01 (559)	≈ 4.60 (6.84)	≈ 3.31 (4.93)	–
E4-56-53-	H4-56-53-		-0	21.14 (537)	22.52 (572)	≈ 4.66 (6.93)	≈ 3.34 (4.97)	–
E4-56-55-	H4-56-55-		-0	21.65 (550)	22.99 (584)	≈ 4.95 (7.36)	≈ 3.48 (5.18)	–
E4-56-60-	H4-56-60-		-0	23.62 (600)	24.96 (634)	≈ 5.09 (7.58)	≈ 3.56 (5.30)	–

Choose from the radii below for all of the above sizes

Radius (mm) Example: E4-56-30- -0

	135**	150	175	200	240	250	300	350	400	450	500
R	5.31 (135)	5.91 (150)	6.89 (175)	7.87 (200)	9.45 (240)	9.84 (250)	11.81 (300)	13.78 (350)	15.75 (400)	17.72 (450)	19.68 (500)
H ^o _{±25}	13.94 (354)	15.12 (384)	17.09 (434)	19.06 (484)	22.20 (564)	22.99 (584)	26.93 (684)	30.87 (784)	34.80 (884)	38.74 (984)	42.68 (1084)
D	10.55 (268)	11.14 (283)	12.13 (308)	13.11 (333)	14.69 (373)	15.08 (383)	17.05 (433)	19.02 (483)	20.98 (533)	22.95 (583)	24.92 (633)
K	24.02 (610)	25.79 (655)	28.94 (735)	32.09 (815)	37.01 (940)	38.19 (970)	44.29 (1125)	50.59 (1285)	56.69 (1440)	62.99 (1600)	69.09 (1755)

** This radius is not available for the R4-56 Series

*Removable lid only, no hinged option

0 = Standard color black. For other colors see Chapter 1, main catalog
For wider chains see page 56. For large diameter hoses see page 56

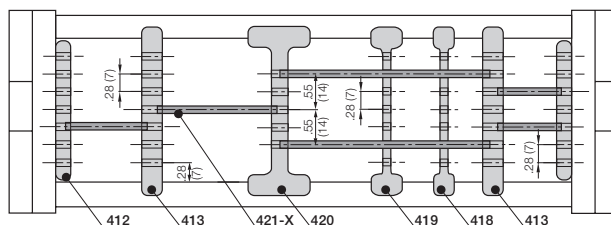
PDF: www.igus.com/e-chain-pdfs
Specs/CAD/RFQ: www.igus.com/e-chains
RoHS info: www.igus.com/RoHS



**Shelves and separators**

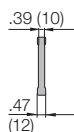
Energy Chains® and Energy Tubes can be subdivided both vertically and horizontally using the various interior separation elements.

► **Design, Chapter 1, main catalog** for layout recommendations.



- Split separator T563 for Energy Chains®**

This separator is ideal for subsequent shelving or the initial assembly of the Energy Chain. Fast assembly and disassembly using a hinge/push mechanism. Enhances flexibility


**Split separator
(chain only)**

Unassembled **Part No. T563**

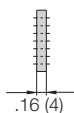
Assembled **Part No. T563M**

**Split separator
T563, to be split
for shelf 420-X**



- Side plates 402**

This component is used to form the basic pattern of a shelf system.


Side plate

Unassembled **Part No. 402**

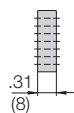
Assembled **Part No. 412**

**Side plate
402**



- Vertical separator 403**

This component is used to form the basic pattern of a shelf system.


Vertical separator

Unassembled **Part No. 403**

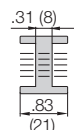
Assembled **Part No. 413**

**Vertical
separator
403**



- Locking vertical separator 410**

This separator is slotted and able to be combined with shelves. For Energy Chains® only


Locking vertical separator

Unassembled **Part No. 410**

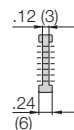
Assembled **Part No. 420**

**Locking vertical
separator
410**



- Slotted separators 408**

These are used for very complex subdivisions. However, they cannot be retrofitted into an existing separation system without removing the shelves first.


Slotted separators, closed

Unassembled **Part No. 408**

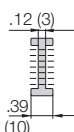
Assembled **Part No. 418**

**Closed slotted
separator
408**



- Slotted separator 409**

This separator can be retrofitted into an existing interior separation system without removing the shelves, as long as these shelves fit into any of the 3 middle slots


Slotted separators, open

Unassembled **Part No. 409**

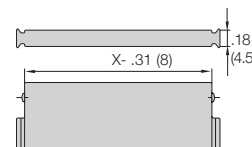
Assembled **Part No. 419**

**Open slotted
separator
409**


Shelves 420-XX

These components form the basic pattern of a shelf system. Shelves of various widths can be arranged at 7 different heights in .28" (7mm) increments

Width X in. (mm)	Usable Width in. (mm)	Part No. Unassembled	Part No. Assembled	Width X in. (mm)	Usable Width in. (mm)	Part No. Unassembled	Part No. Assembled
.71 (18)	.39 (10)	420-18	421-18	2.95 (75)	2.64 (67)	420-75	421-75
.91 (23)	.59 (15)	420-23	421-23	3.46 (88)	3.15 (80)	420-88	421-88
.98 (25)	.67 (17)	420-25	421-25	3.94 (100)	3.62 (92)	420-100	421-100
1.10 (28)	.79 (20)	420-28	421-28	4.92 (125)	4.61 (117)	420-125	421-125
1.30 (33)	.98 (25)	420-33	421-33	5.91 (150)	5.59 (142)	420-150	421-150
1.69 (43)	1.38 (35)	420-43	421-43	6.89 (175)	6.57 (167)	420-175	421-175
1.97 (50)	1.65 (42)	420-50	421-50	7.36 (187)	7.05 (179)	420-187	421-187
2.44 (62)	2.13 (54)	420-62	421-62	7.87 (200)	7.56 (192)	420-200	421-200



Energy Chain system® E4-1

Series E4-56/H4-56/R4-56

Interior Separation

energy chain® configurator

igus®

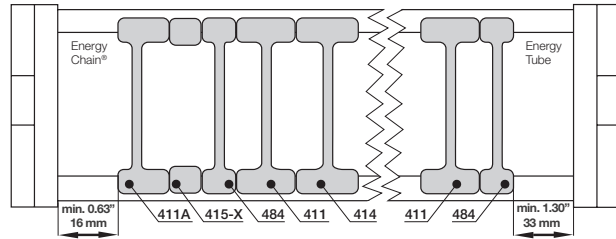
E4-56
H4-56
R4-56



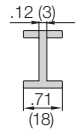
Vertical separators and spacers

Vertical separators are used if a vertical subdivision of the Energy Chain® interior is required. In standard configuration, a separator is installed every second chain link.

NOTE: Observe a lateral spacing of at least 1.26 in. (32mm) for Energy Tubes and .63 in. (16mm) for Energy Chain®. There is no minimum spacing needed for side plates



Vertical separator
401



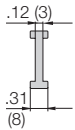
Vertical separator

Unassembled Part No. 401

Assembled Part No. 411



Vertical separator
483



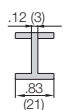
Vertical separator

Unassembled Part No. 483

Assembled Part No. 484



Locking separator
404



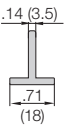
Locking separator (chain only)

Unassembled Part No. 404

Assembled Part No. 414



Locking separator
406



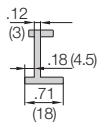
Locking separator (tube only)

Unassembled Part No. 406

Assembled Part No. 416



Asymmetric separator
401A



Asymmetrical separator (chain only)

Unassembled Part No. 401A

Assembled Part No. 411A



Spacers
405-XX



XX = width of the spacer

Spacer

(chain only)

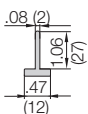
Unassembled Part No. 405-XX

Assembled Part No. 415-XX

Spacers available in the following sizes:

Part No. Unassembled	Part No. Assembled	in.	(mm)
405 -10	415 -10	.39"	(10)
405 -15	415 -15	.59"	(15)
405 -20	415 -20	.79"	(20)
405 -30	415 -30	1.18"	(30)
405 -40	415 -40	1.57"	(40)

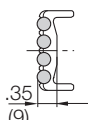
Center crossbar - for applications involving a very large number of thin cables This offers the option of subdividing the Energy Chain® into upper and lower halves



Center crossbar

Unassembled Part No. 405

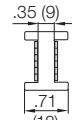
Assembled Part No. 415



Rollclip

Unassembled Part No. 489-27

Assembled Part No. 490-27



Center crossbar

Unassembled Part No. 429

Assembled Part No. 430

Standard separator 401 for Energy Chains® and Energy Tubes

This separator offers safe stability due to its wide base design.

Vertical separator 483 for Energy Chains® and Energy Tubes

This separator offers a narrow base for applications where a large number of small cables need to be individually separated.

Locking separator 404 for Energy Chains®

This separator features increased retention force for applications exposed to very high humidity and extreme loads. The extra retention force is achieved by asymmetric claws for the crossbar. Take care to ensure proper alignment.

Locking separator 406 for Energy Tubes

It features a single sided, secure fit, and can be placed on the lid or the bottom of the Energy Tube. The single side locking design helps to eliminate difficulties in assembling the opposite cover or crossbar

Asymmetrical separator 401A for Energy Chains®

This separator features an .71" (18mm) base. It can be used in combinations between spacers of different widths and vertical separators in side mounted applications.

NOTE ON SPACERS

Vertical separators are adjustable, but can be fixed in position by means of a spacer. Spacers are most often necessary for side mounted applications. The available inner height is reduced by .08" (2mm) **per spacer** (for example if one spacer is placed on either side of the separator, the overall inner height is reduced by .16" (4mm). To avoid this, place the spacers on the **outside** of the opening crossbar (**not for long travels**).

Roller separator - performs a similar function to the Rollclip, but doubles as a separator.

PDF: www.igus.com/e-chain-pdfs
Specs/CAD/RFQ: www.igus.com/e-chains
RoHS info: www.igus.com/RoHS



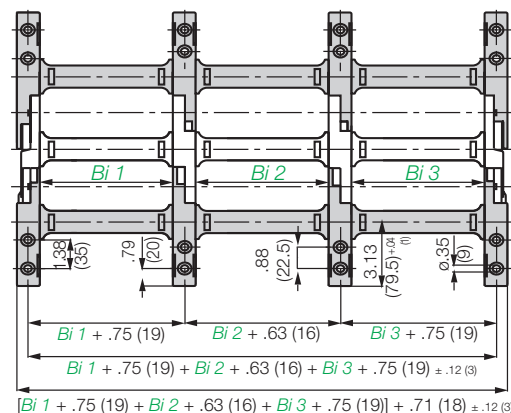


Part number example for
Energy Chain®

E4-56-10/20/10- 200 -0

E4-56-*Bi1/Bi2/Bi3*- R -0

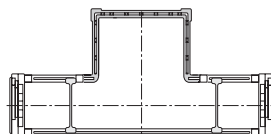
We **strongly** recommend
on-site consultation with an
igus® technician for individual
advice regarding mounting
brackets, guide troughs and
other design details.



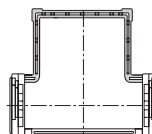
Consult igus® for your
extender crossbar
applications. We will be
happy to assist you with
your design layout.

Extender crossbars - For careful guiding of large diameter cables and hoses

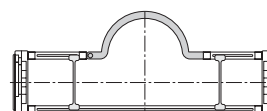
- Intended for cables and hoses with a maximum outer diameter of 9.65 in. (245 mm).
- Can be attached along either the inner or outer radius, inner radius preferred
- Gliding operation with crossbars assembled along the outer radius in conjunction with a special guide trough
- Gliding operation not guaranteed with crossbars assembled along the inner radius
- The extender crossbar can either be attached to the side links directly or can be used in combination with two standard snap-open crossbars.



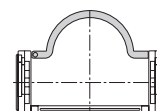
Square extender crossbar
combined with standard snap-
open crossbars.



Attached directly to
the side link.



Round extender crossbar
combined with standard snap-
open crossbars.



Attached directly to
the side link.

Part No.	Max Ø Hose	Style	Installation Side Link	Combined with Snap-Open Crossbars
450-15-RHD115	4.52 (115)	Round	No	Yes
450-17-RD115	4.52 (115)	Round	Yes	No
450-25-D150	5.91 (150)	Square	Yes	No
450-30-D200	7.09 (180)	Square	Yes	No
450-35-D250	7.68 (195)	Square	Yes	No
450-40-D300	9.65 (245)	Square	Yes	No
450-20-HD150	5.91 (150)	Square	No	Yes
450-25-HD200	7.09 (180)	Square	No	Yes
450-30-HD250	7.68 (195)	Square	No	Yes



E4 clip on cable binder

- For side mounted applications
- Serves as a clip-on, lateral guide for hoses and cables on Energy Chains®
- The loops can be adjusted as needed

- Compatible with many E4 Energy Chains®
- Economical
- One clip and one locking band are needed for each chain link



Part No.	Form
450-B12	Locking clip, comprised of a locking element
450-B12-200	Locking band, comprised of a locking element and band; 12 x 1.5 x 200 mm

Energy Chain system® E4-1

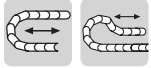
Series E4-56/H4-56/R4-56

Mounting Brackets

energy chain® configurator

igus®

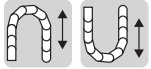
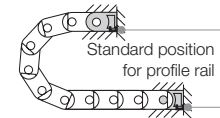
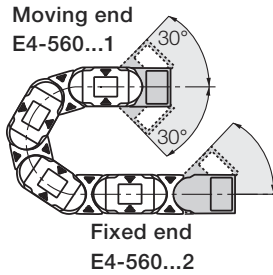
E4-56
H4-56
R4-56



Option 1: pivoting

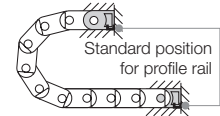
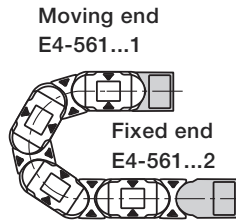


- Recommended for unsupported and gliding applications
- Attachment capability on all sides
- Bolted connection outside of chain cross-section
- Space restricted conditions
- Corrosion resistant



Option 2: locking

- Profile rail option
- Universal use
- Corrosion resistant
- Vertical hanging/standing travels
- Extreme accelerations



Part Number Structure

E4-560-07-12 P

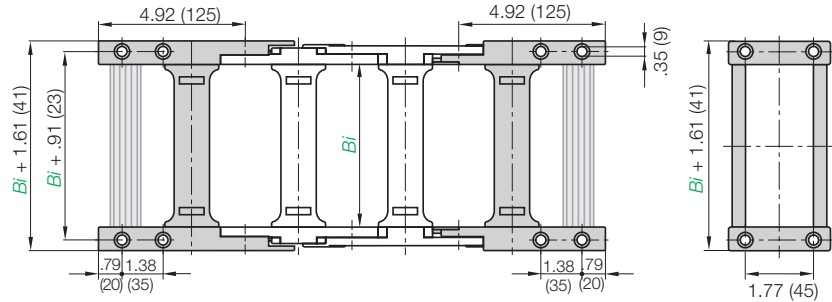
With Profile Rail

Complete Set

Width

E4-560 = Pivoting for chain
R4-560 = Pivoting for tube

E4-561 = Locking for chain
R4-561 = Locking for tube



Due to the design of the E4-56 series chains, please note the following when ordering brackets:

Even number of links = full set, part number ending in -12
Odd number of links = 2 pieces, part number ending in -2

Part number examples are shown for pivoting brackets for Energy Chain. For locking brackets change part number to 561

Part No. Full Set (pivoting)
Series E4-56 or H4-56
E4-560-Width-12

Part No. Full Set (pivoting)
with profile rail
Series E4-56 or H4-56
E4-560-Width-12P

Part No. Full Set (pivoting)
Tube Series R4-56
R4-560-Width-12

Part No. Full Set (pivoting)
with Profile Rail
Tube Series R4-56
R4-560-Width-12P

Width	Part No. Full Set chain/tube		With Profile Rail	Bi in. (mm)
	Pivoting	Locking		
-05*	E4-560/R4-560	E4-561/R4-561	-05-12 P	1.97 (50)
-06	E4-560	E4-561	-06-12 P	2.56 (65)
-07	E4-560/R4-560	E4-561/R4-561	-07-12 P	2.95 (75)
-08	E4-560	E4-561	-08-12 P	3.43 (87)
-10	E4-560/R4-560	E4-561/R4-561	-10-12 P	3.94 (100)
-11	E4-560	E4-561	-11-12 P	4.41 (112)
-12	E4-560/R4-560	E4-561/R4-561	-12-12 P	4.92 (125)
-13	E4-560	E4-561	-13-12 P	5.39 (137)
-15	E4-560/R4-560	E4-561/R4-561	-15-12 P	5.91 (150)
-16	E4-560	E4-561	-16-12 P	6.38 (162)
-17	E4-560	E4-561	-17-12 P	6.89 (175)
-18	E4-560	E4-561	-18-12 P	7.36 (187)
-20	E4-560/R4-560	E4-561/R4-561	-20-12 P	7.87 (200)
-21	E4-560	E4-561	-21-12 P	8.35 (212)
-22	E4-560	E4-561	-22-12 P	8.86 (225)
-23	E4-560	E4-561	-23-12 P	9.33 (237)
-25	E4-560/R4-560	E4-561/R4-561	-25-12 P	9.84 (250)
-26	E4-560	E4-561	-26-12 P	10.31 (262)
-27	E4-560	E4-561	-27-12 P	10.83 (275)
-28	E4-560	E4-561	-28-12 P	11.30 (287)
-30	E4-560/R4-560	E4-561/R4-561	-30-12 P	11.81 (300)

Width	Part No. Full Set chain/tube		With Profile Rail	Bi in. (mm)
	Pivoting	Locking		
-31	E4-560	E4-561	-31-12 P	12.28 (312)
-32	E4-560	E4-561	-32-12 P	12.79 (325)
-33	E4-560	E4-561	-33-12 P	13.27 (337)
-35	E4-560/R4-560	E4-561/R4-561	-35-12 P	13.78 (350)
-36	E4-560	E4-561	-36-12 P	14.25 (362)
-37	E4-560	E4-561	-37-12 P	14.76 (375)
-38	E4-560	E4-561	-38-12 P	15.24 (387)
-40	E4-560/R4-560	E4-561/R4-561	-40-12 P	15.75 (400)
-41	E4-560	E4-561	-41-12 P	16.22 (412)
-42	E4-560	E4-561	-42-12 P	16.73 (425)
-43	E4-560	E4-561	-43-12 P	17.20 (437)
-45	E4-560	E4-561	-45-12 P	17.72 (450)
-46	E4-560/R4-560	E4-561/R4-561	-46-12 P	18.19 (462)
-47	E4-560	E4-561	-47-12 P	18.70 (475)
-48	E4-560	E4-561	-48-12 P	19.17 (487)
-50	E4-560	E4-561	-50-12 P	19.69 (500)
-51	E4-560	E4-561	-51-12 P	20.16 (512)
-52	E4-560	E4-561	-52-12 P	20.67 (525)
-53	E4-560	E4-561	-53-12 P	21.14 (537)
-55	E4-560	E4-561	-55-12 P	21.65 (550)
-60	E4-560	E4-561	-60-12 P	23.62 (600)

PDF: www.igus.com/e-chain-pdfs
Specs/CAD/RFQ: www.igus.com/e-chains
RoHS info: www.igus.com/RoHS



Chainfix clamps for
the profile rail

igus® Chainfix strain relief elements are available in either steel or stainless steel. They can be adjusted with a hexagon socket and are available in single, double and triple configurations.

Part No. Single Clamp		Part No. Double Clamp		Part No. Triple Clamp		Cable ø	
Steel	Stainless	Steel	Stainless	Steel	Stainless	in.	(mm)
CFX12-1	CFX12-1E	CFX12-2	CFX12-2E	CFX12-3	–	.24 - .47	(06 - 12)
CFX14-1	CFX14-1E	CFX14-2	CFX14-2E	CFX14-3	–	.47 - .55	(12 - 14)
CFX16-1	CFX16-1E	CFX16-2	CFX16-2E	CFX16-3	–	.55 - .63	(14 - 16)
CFX18-1	CFX18-1E	CFX18-2	CFX18-2E	CFX18-3	–	.63 - .71	(16 - 18)
CFX20-1	CFX20-1E	CFX20-2	CFX20-2E	CFX20-3	–	.71 - .79	(18 - 20)
CFX22-1	CFX22-1E	CFX22-2	CFX22-2E	CFX22-3	–	.79 - .87	(20 - 22)
CFX26-1	CFX26-1E	CFX26-2	CFX26-2E	–	–	.87 - 1.02	(22 - 26)
CFX30-1	CFX30-1E	CFX30-2	CFX30-2E	–	–	1.02 - 1.18	(26 - 30)
CFX34-1	CFX34-1E	CFX34-2	CFX34-2E	–	–	1.18 - 1.34	(30 - 34)
CFX38-1	CFX38-1E	–	–	–	–	1.34 - 1.50	(34 - 38)
CFX42-1	CFX42-1E	–	–	–	–	1.50 - 1.65	(38 - 42)

For more information please refer to strain relief section of Chapter 10 in main catalog.

Chainfix Clip



Modular snap-on strain relief device

Chainfix clips are available for cable diameters ranging from .16" (4mm) to .94" (24 mm). They are for assembly on KMA mounting brackets, clip-on strain relief for crossbars as well as profile rails. Quick assembly without the use of tools. **For more information please refer to strain relief section of Chapter 10 in main catalog.**

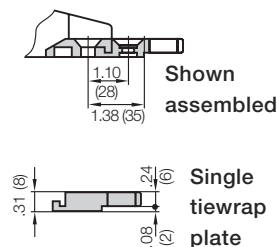
Cable ø	Part No.	Part No.
in. (mm)	Clamp	Bottom
.16-.31 (04-08)	CFC-08-M	CFC-08-C
.31-.47 (08-12)	CFC-12-M	CFC-12-C
.47-.63 (12-16)	CFC-16-M	CFC-16-C
.63-.79 (16-20)	CFC-20-M	CFC-20-C
.79-.94 (20-24)	CFC-24-M	CFC-24-C

Tiewrap Plates

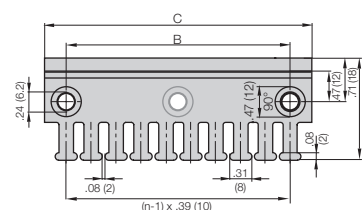
Option 1:

Tiewrap plates as an individual part

Available as an individual component, can be fixed onto a mounting bracket with the use of a profile rail.



Tiewrap Plate	n Number of Teeth	C Overall Width in. (mm)	B Bore Width in. (mm)	Center Bore
3050-ZB	5	1.97 (50)	1.18 (30)	no
3075-ZB	7	2.95 (75)	2.16 (55)	no
3100-ZB	10	3.94 (100)	3.15 (80)	no
3115-ZB	11	4.53 (115)	3.74 (95)	no
3125-ZB	12	4.92 (125)	4.13 (105)	no
3150-ZB	15	5.91 (150)	5.12 (130)	no
3175-ZB	17	6.89 (175)	6.10 (155)	no
3200-ZB	20	7.87 (200)	7.09 (180)	yes
3225-ZB	22	8.86 (225)	8.07 (205)	yes
3250-ZB	25	9.84 (250)	9.06 (230)	yes



If used with KMA brackets with profile rail please add "KMA" to the end of the part number.

Example: 3050-ZBKMA

For more information please refer to strain relief section of Chapter 10 in main catalog.



Option 2:

Clip-on Tiewrap plates

Available as a clip-on tiewrap plate without the use of bolts. They are inserted and removed with a screwdriver used as a lever. Clip-on tiewrap plates are also available as an attachment to the opening crossbars.

Part No.	Number of Teeth	Width of Strain Relief in. (mm)
3050-ZC	5	1.97 (50)
3075-ZC	7	2.95 (75)

For more information please refer to strain relief section of Chapter 10 in main catalog.

Energy Chain system® E4-1

Series E4-56/H4-56/R4-56

Guide Trough

energy chain® configurator

igus®

E4-56
H4-56
R4-56

Width of Crossbar
E4-56-05-200-0

	B_{Ri}	Installation Part No.
-05	3.50 (89)	*
-06	4.09 (104)	94-50-225
-07	4.49 (114)	94-50-225
-08	5.04 (128)	94-50-250
-10	5.47 (139)	94-50-250
-11	5.98 (152)	94-50-275
-12	6.46 (164)	94-50-275
-13	6.97 (177)	94-50-300
-15	7.44 (189)	94-50-300
-16	7.95 (202)	94-50-325
-17	8.42 (214)	94-50-325
-18	8.94 (227)	94-50-350
-20	9.41 (239)	94-50-350
-21	9.92 (252)	94-50-375
-22	10.39 (264)	94-50-375
-23	10.91 (277)	94-50-400
-25	11.38 (289)	94-50-400
-26	11.89 (302)	94-50-425
-27	12.36 (314)	94-50-425
-28	12.87 (327)	94-50-450
-30	13.35 (339)	94-50-450
-31	13.86 (352)	94-50-475
-32	14.33 (364)	94-50-475
-33	14.84 (377)	94-50-500
-35	15.31 (389)	94-50-500
-36	15.82 (402)	94-50-525
-37	16.30 (414)	94-50-525
-38	16.81 (427)	94-50-550
-40	17.28 (439)	94-50-550
-41	17.79 (452)	94-50-575
-42	18.27 (464)	94-50-575
-43	18.78 (477)	94-50-600
-45	19.25 (489)	94-50-600
-46	19.76 (502)	94-50-625
-47	20.24 (514)	94-50-625
-48	20.75 (527)	94-50-650
-50	21.22 (539)	94-50-650
-51	21.73 (552)	94-50-675
-52	22.20 (564)	94-50-675
-53	22.72 (577)	94-50-700
-55	23.19 (589)	94-50-700
-60	25.16 (639)	94-50-750

Guide troughs are used with applications where the upper run of the Energy Chain® glides on the lower run. If using igus® steel guide troughs, the following components are required.

- Full travel length of guide trough
Part No. 94-30
- 1/2 travel length glide bars
Part No. 93-01
- Installation sets as end connectors
Part No. 94-50-XX

.XX indicates the length of the profile rails on which the guide trough is mounted. The values and part numbers are specified in the table on the left. The standard length of the trough components and glide bars is 6.56 ft (2m). The required overall length of the guide trough directly correlates to the length of travel.

Example:

Length of travel 164 ft (50 m)
Center mounted

Required guide troughs:

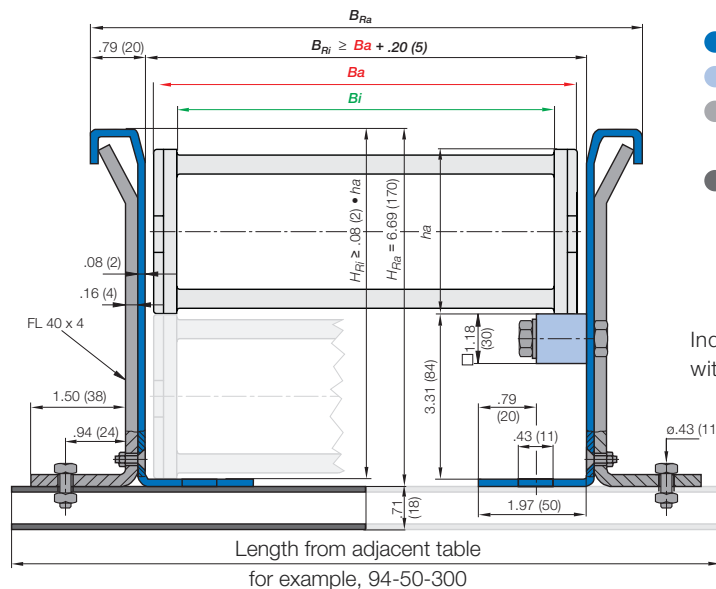
164 ft (50 m) guide trough
82 ft (25 m) glide bars
= 25 sections of 6.56 ft (2 m) guide trough
Part No. 94-30
= 13 sections of 6.56 ft (2 m) glide bars
Part No. 93-01

Required number of installation sets:

= Number of guide trough components + 1
= 25 + 1 = 26
Part number of the installation sets
94-50-XXX

Example:

94-50-400 for 15.75 (400 mm) long profile rail



- Guide trough
- Glide bars
- Installation set "Basic"
- Profile rail

Individual attachment without profile rail

* Specialized guide trough available upon request



Left: Guide trough with glide bars
Right: Guide troughs without glide bars



Installation sets as section connectors

PDF: www.igus.com/e-chain-pdfs
Specs/CAD/RFQ: www.igus.com/e-chains
RoHS info: www.igus.com/RoHS



E4-80
H4-80
R4-80



Energy Chain system® E4-1 Series E4-80/H4-80/R4-80

Price Index



Series E4-80



Series H4-80



Series R4-80

Special Options Available



Low noise version available
with special rubber pads



Cleanroom test upon request



ESD classification:
Electrically conductive
ESD/ATEX version upon request

Assembly Tips



Opening Energy Chains®: Remove crossbars and clips - Insert screwdriver into the slot, push down, release by lever action



Remove lids/bottoms (Energy Tubes) - Insert screwdriver into the slot, release by lever action

Other Installation Methods

Vertical, hanging ≤ 394 ft (120 m)

Vertical, standing ≤ 19.69 ft (6 m)

Side-mounted, unsupp. ≤ 9.84 ft (3 m)

Rotary requires further calculation

Usage Guidelines



- If quiet operation is required
- If very high speeds and/or accelerations are required
- Long travels
- High additional loads



- When an extremely low vibration Energy Chain®/Energy Tube is required
➤ **Series E6-80**
- When an economic one-sided snap-open Energy Chain®/Energy Tube is required
➤ **Series 15050/15150/R19850**

Features & Benefits

- 1 Wide, rounded plastic crossbars - cable friendly
- 2 Low-noise operation through integrated brake in the radial stop dog system
- 3 Hinged snap-open removable lids along the outer radius of the Energy Tube
- 4 Straight run through inner-/outer-link design
- 5 The tongue and groove design provides greater lateral stability
- 6 QuickLock Crossbar, 450-X-Q, available for faster assembly/disassembly
- 7 New Interior separation kit available
- 8 Crossbars are removable along both radii
- 9 15% more tensile strength (compared to the older E4 series), better unsupported length through improved stop dog system and vertical radial stops
- 10 Version NCST "without camber" simply by turning outer links without unnecessary rework



Also available without camber.
Add NCST to the end of the
part number.
Ex: E4-80-30-300NCST

Order Example: Complete Energy Chain®

Please indicate chain length or number of links. Example:

16.4 ft (5 m) **E4-80-30-300-0**

With 2 separators **511** assembled every 2nd link

1 Set **E4-800-30-12P**



Energy Chain®



Interior Separation



Mounting Bracket

Energy Chain system® E4-1 Series E4-80/H4-80/R4-80 Installation Dimensions

energy chain® configurator

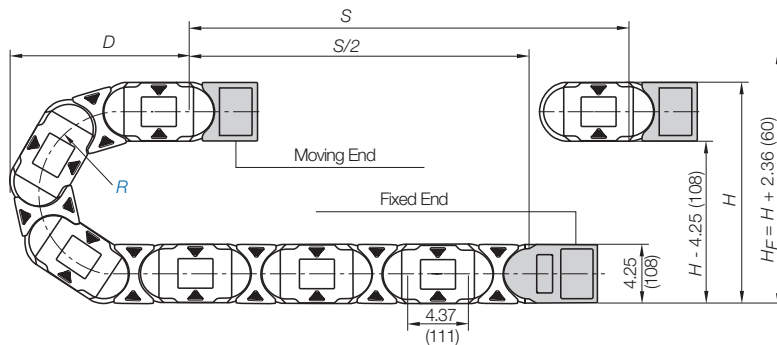
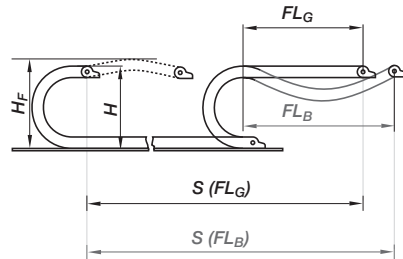


E4-80
H4-80
R4-80

Short travel, unsupported length

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

Further information ► Design, Chapter 1, main catalog

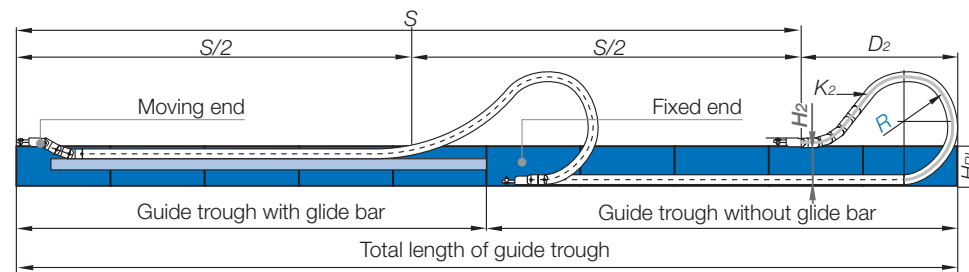


The required clearance height: $H_F = H + 2.36$ in. (60 mm) (with 2.02 lbs/ft (3 kg/m) fill weight).
Please consult igus® if space is particularly restricted.

R	5.91 (150)	7.87 (200)	9.84 (250)	11.81 (300)	13.78 (350)	15.75 (400)	19.68 (500)	21.65 (550)	23.62 (600)	39.37 (1000)
H_{25}^0	16.06 (408)	20.00 (508)	23.94 (608)	27.87 (708)	31.81 (808)	35.75 (908)	43.62 (1108)	47.56 (1208)	51.50 (1308)	82.99 (2108)
D	12.40 (315)	14.37 (365)	16.34 (415)	18.31 (465)	20.28 (515)	22.24 (565)	26.18 (665)	28.15 (715)	30.12 (765)	45.87 (1165)
K	27.36 (695)	33.66 (855)	39.76 (1010)	45.87 (1165)	52.17 (1325)	58.27 (1480)	70.67 (1795)	76.77 (1950)	83.07 (2110)	132.48 (3365)

For long travels with lowered mounting height

Long travel lengths from 32.8 ft.(10m) to max. 1,312 ft. (400m)



For center mount applications:

$$\text{Chain length} = \frac{S}{2} + K_2$$

In case of travels between 13 and 32.8 ft (4 and 10 m) we recommend a longer unsupported length.

R	5.91 (150)	7.87 (200)	9.84 (250)	11.81 (300)	13.78 (350)	15.75 (400)	19.68 (500)	21.65 (550)	23.62 (600)	39.37 (1000)
H_2	9.53 (242)	9.53 (242)	9.53 (242)	9.53 (242)	9.53 (242)	9.53 (242)	9.53 (242)	-	-	-
D_{2+25}	21.65 (550)	31.50 (800)	39.37 (1000)	47.24 (1200)	57.09 (1450)	62.99 (1600)	82.68 (2100)	-	-	-
K_2	35.04 (890)	52.36 (1330)	65.55 (1665)	78.74 (2000)	91.73 (2330)	104.72 (2660)	135.43 (3440)	-	-	-



For support of the lower run, see Chapter 9 of the main catalog for the Support Tray tool kit

Short Travels - Unsupported

Unsupported Energy Chains® feature positive camber over short travels. This must be accounted for when specifying the clearance height. Please refer to Installation dimensions for further details.

Legend

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

Pitch per link = 4.37" (111 mm)

Links per ft (m) = 2.75 (9)

For center mount applications:

$$\text{Chain length} = \frac{S}{2} + K$$

Long Travels - Gliding



If the unsupported length is exceeded, the Energy Chain®/Tube must glide on itself. This requires a guide trough.

Design, Chapter 1, main catalog

Technical Data



Details of material properties

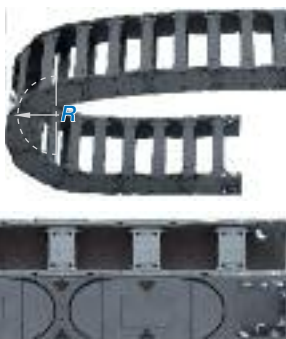
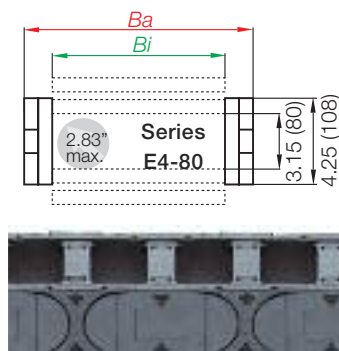
► Chapter 1

Speed / acceleration FL_G	max. 65.6 ft/s (20 m/s) / max. 656 ft/s² (200 m/s²)
Speed / acceleration FL_B	max. 9.84 ft/s (3 m/s) / max. 19.69 ft/s² (6 m/s²)
Gliding speed / acceleration (maximum)	max. 32.8 ft/s (10 m/s) / max. 164 ft/s² (50 m/s²)
Material - permitted temperature	igumid G / -40°F (-40°C) up to +248°F (+120°C)
Flammability Class, igumid G	VDE 0304 IIC UL94 HB

PDF: www.igus.com/e-chain-pdfs
Specs/CAD/RFO: www.igus.com/e-chains
RoHS info: www.igus.com/RoHS



Series E4-80 - Energy Chain® with crossbars every link



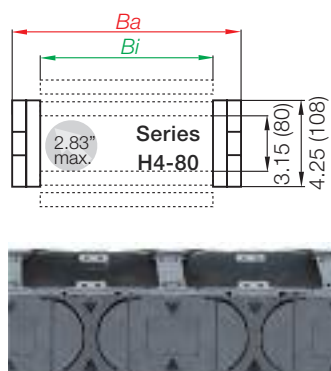
- Crossbars every link
- For use with rigid hydraulic hoses
- For particularly demanding applications
- Can be opened from both sides

Part Number Structure

E4-80- 30- 300- 0

Color - Black
Bending radius
Width
Series

Series H4-80 - Energy Chain® with crossbars every other link



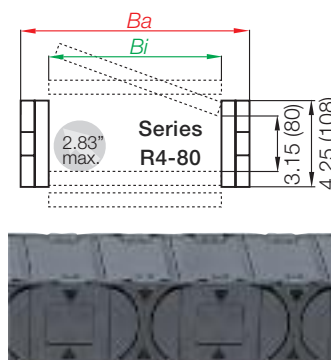
- Crossbars every other link - Standard configuration
- For nearly every situation
- Can be opened from both sides
- Easy assembly
- Stable
- Cost-effective

Part Number Structure

H4-80- 30- 300- 0

Color - Black
Bending radius
Width
Series

Series R4-80 - fully enclosed Energy Tube



- Fully enclosed
- Excellent cable and hose protection against dirt
- Protection against hot chips up to 1652°F (900°C)
- Lids along inner radius are completely removable
- Lids along the outer radius are single-sided, snap open, hinged on one side as well as completely removable

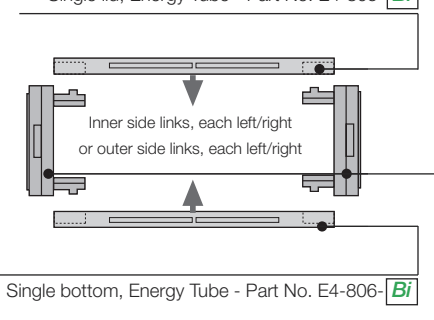
Part Number Structure

R4-80- 30- 300- 0

Color - Black
Bending radius
Width
Series

Energy Chain® as separate parts, links and side plates

Single crossbar, Energy Chain® - Part No. 450- **Bi**
Single lid, Energy Tube - Part No. E4-805- **Bi**

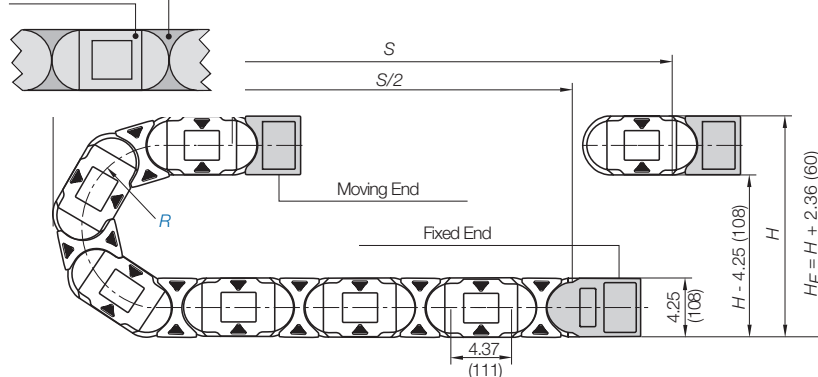


Single bottom, Energy Tube - Part No. E4-806- **Bi**
Outer side link, single part - Part No. E4-80-01 (Suitable for all radii)

Inner side link, single part - Part No. E4-80-02- **R**

Inner side link

Outer side link



Energy Chain system® E4-1

Series E4-80/H4-80/R4-80

energy chain® configurator



E4-80
H4-80
R4-80

Supplement part number with required radius. Example: E4-80-30-300-0

Pitch: 4.37 in. (91mm) per link links/ft(m) = 2.75 (9)

Part Number

Crossbars Every link	Crossbars Every other	Tube Version		<i>Bi</i> in. (mm)	<i>Ba</i> in. (mm)	Weight		
						E4-80 lbs/ft (kg/m)	H4-80 lbs/ft (kg/m)	R4-80 lbs/ft (kg/m)
E4-80-05-	H4-80-05-		-0	1.97 (50)	3.94 (100)	≈ 3.59 (5.34)	≈ 3.51 (5.22)	–
E4-80-06-	H4-80-06-		-0	2.56 (65)	4.53 (115)	≈ 3.64 (5.41)	≈ 3.53 (5.26)	–
E4-80-07-	H4-80-07-		-0*	2.95 (75)	4.92 (125)	≈ 3.68 (5.47)	≈ 3.55 (5.29)	–
E4-80-08-	H4-80-08-		-0	3.43 (87)	5.39 (137)	≈ 3.74 (5.56)	≈ 3.57 (5.32)	–
E4-80-10-	H4-80-10-		-0	3.94 (100)	5.91 (150)	≈ 3.77 (5.61)	≈ 3.60 (5.36)	–
E4-80-11-	H4-80-11-		-0	4.41 (112)	6.42 (163)	≈ 3.84 (5.71)	≈ 3.63 (5.40)	–
E4-80-12-	H4-80-12-		-0	4.92 (125)	6.89 (175)	≈ 3.88 (5.77)	≈ 3.66 (5.44)	–
E4-80-13-	H4-80-13-		-0	5.39 (137)	7.40 (188)	≈ 3.95 (5.88)	≈ 3.69 (5.49)	–
E4-80-15-	H4-80-15-		-0	5.91 (150)	7.87 (200)	≈ 3.97 (5.91)	≈ 3.70 (5.51)	–
E4-80-16-	H4-80-16-		-0	6.38 (162)	8.39 (213)	≈ 4.03 (6.00)	≈ 3.73 (5.55)	–
E4-80-17-	H4-80-17-		-0	6.89 (175)	8.86 (225)	≈ 2.76 (6.11)	≈ 3.77 (5.61)	–
E4-80-18-	H4-80-18-		-0	7.36 (187)	9.37 (238)	≈ 4.17 (6.20)	≈ 3.80 (5.65)	–
E4-80-20-	H4-80-20-	R4-80-20-	-0	7.87 (200)	9.84 (250)	≈ 4.20 (6.25)	≈ 3.82 (5.68)	≈ 6.86 (7.23)
E4-80-21-	H4-80-21-		-0	8.35 (212)	10.35 (263)	≈ 4.23 (6.31)	≈ 3.84 (5.71)	–
E4-80-22-	H4-80-22-		-0	8.86 (225)	10.83 (275)	≈ 4.27 (6.36)	≈ 3.85 (5.73)	–
E4-80-23-	H4-80-23-		-0	9.33 (237)	11.34 (288)	≈ 4.33 (6.45)	≈ 3.88 (5.78)	–
E4-80-25-	H4-80-25-	R4-80-25-	-0	9.84 (250)	11.81 (300)	≈ 4.39 (6.54)	≈ 3.91 (5.82)	≈ 5.42 (8.06)
E4-80-26-	H4-80-26-		-0	10.31 (262)	12.32 (313)	≈ 4.45 (6.62)	≈ 3.94 (5.86)	–
E4-80-27-	H4-80-27-		-0	10.83 (275)	12.80 (325)	≈ 4.50 (6.70)	≈ 3.96 (5.90)	–
E4-80-28-	H4-80-28-		-0	11.30 (287)	13.31 (338)	≈ 4.54 (6.75)	≈ 3.98 (5.93)	–
E4-80-30-	H4-80-30-	R4-80-30-	-0	11.81 (300)	13.78 (350)	≈ 4.62 (6.87)	≈ 4.03 (5.99)	≈ 5.87 (8.73)
E4-80-31-	H4-80-31-		-0	12.28 (312)	14.29 (363)	≈ 4.64 (6.90)	≈ 4.03 (6.00)	–
E4-80-32-	H4-80-32-		-0	12.79 (325)	14.76 (375)	≈ 4.70 (6.99)	≈ 4.07 (6.05)	–
E4-80-33-	H4-80-33-		-0	13.27 (337)	15.28 (388)	≈ 4.76 (7.09)	≈ 4.10 (6.10)	–
E4-80-35-	H4-80-35-		-0	13.78 (350)	15.75 (400)	≈ 4.87 (7.25)	≈ 4.15 (6.18)	–
E4-80-36-	H4-80-36-		-0	14.25 (362)	16.26 (413)	≈ 4.82 (7.18)	≈ 2.53 (6.14)	–
E4-80-37-	H4-80-37-		-0	14.76 (375)	16.73 (425)	≈ 4.88 (7.26)	≈ 4.15 (6.18)	–
E4-80-38-	H4-80-38-		-0	15.24 (387)	17.24 (438)	≈ 4.94 (7.35)	≈ 4.19 (6.23)	–
E4-80-40-	H4-80-40-	R4-80-40-	-0	15.75 (400)	17.72 (450)	≈ 5.09 (7.57)	≈ 4.26 (6.34)	≈ 6.86 (10.21)
E4-80-41-	H4-80-41-		-0	16.22 (412)	18.23 (463)	≈ 5.05 (7.51)	≈ 4.24 (6.31)	–
E4-80-42-	H4-80-42-		-0	16.73 (425)	18.70 (475)	≈ 5.21 (7.75)	≈ 4.32 (6.43)	–
E4-80-43-	H4-80-43-		-0	17.20 (437)	19.21 (488)	≈ 5.12 (7.62)	≈ 4.27 (6.36)	–
E4-80-45-	H4-80-45-		-0	17.72 (450)	19.69 (500)	≈ 5.30 (7.89)	≈ 4.37 (6.50)	–
E4-80-46-	H4-80-46-		-0	18.19 (462)	20.20 (513)	≈ 5.27 (7.85)	≈ 4.35 (6.48)	–
E4-80-47-	H4-80-47-		-0	18.70 (475)	20.67 (525)	≈ 5.29 (7.88)	≈ 4.366 (6.49)	–
E4-80-48-	H4-80-48-		-0	19.17 (487)	21.19 (538)	≈ 5.44 (8.09)	≈ 4.43 (6.60)	–
E4-80-50-	H4-80-50-		-0	19.69 (500)	21.65 (550)	≈ 5.44 (8.09)	≈ 4.43 (6.60)	–
E4-80-51-	H4-80-51-		-0	20.16 (512)	22.16 (563)	≈ 5.49 (8.17)	≈ 4.46 (6.63)	–
E4-80-52-	H4-80-52-		-0	20.67 (525)	22.64 (575)	≈ 5.54 (8.24)	≈ 4.48 (6.67)	–
E4-80-53-	H4-80-53-		-0	21.14 (537)	23.15 (588)	≈ 5.58 (8.31)	≈ 4.51 (6.71)	–
E4-80-55-	H4-80-55-		-0	21.65 (550)	23.62 (600)	≈ 5.82 (8.66)	≈ 4.62 (6.88)	–
E4-80-60-	H4-80-60-		-0	23.62 (600)	25.59 (650)	≈ 5.94 (8.84)	≈ 4.68 (6.97)	–

Choose from the radii below for all of the above sizes

Radius (mm)

Example: E4-80-30300-0

	150	200	250	300	350	400	500	550	600	1000
R	5.91 (150)	7.87 (200)	9.84 (250)	11.81 (300)	13.78 (350)	15.75 (400)	19.68 (500)	21.65 (550)	23.62 (600)	39.37 (1000)
H _{±25} ⁰	16.06 (408)	20.00 (508)	23.94 (608)	27.87 (708)	31.81 (808)	35.75 (908)	43.62 (1108)	47.56 (1208)	51.50 (1308)	82.99 (2108)
D	12.40 (315)	14.37 (365)	16.34 (415)	18.31 (465)	20.28 (515)	22.24 (565)	26.18 (665)	28.15 (715)	30.12 (765)	45.87 (1165)
K	27.36 (695)	33.66 (855)	39.76 (1010)	45.87 (1165)	52.17 (1325)	58.27 (1480)	70.67 (1795)	76.77 (1950)	83.07 (2110)	132.48 (3365)

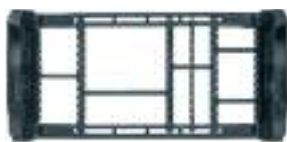
** This radius is not available for the R9850 Series

*Removable lid only, no hinged option

0 = Standard color black. For other colors see Chapter 1, main catalog
For wider chains see page 68. For large diameter hoses see page 68

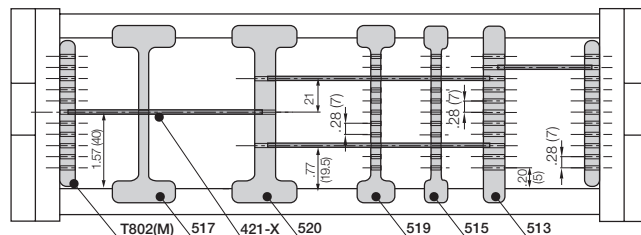
PDF: www.igus.com/e-chain-pdfs
Specs/CAD/RFO: www.igus.com/e-chains
RoHS info: www.igus.com/RoHS



**Shelves and separators**

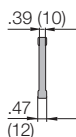
Energy Chains® and Energy Tubes can be subdivided both vertically and horizontally using the various interior separation elements.

► **Design, Chapter 1, main catalog** for layout recommendations.



- **Split separator T803**

This component is used to form the basic pattern of a shelf system.

**Side plate (for Energy Chains®)**

Unassembled **Part No. T803**

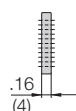
Assembled **Part No. T803M**

**Split separator
T803
for shelf 420-X**



- **Side plates 802**

This component is used to form the basic pattern of a shelf system.

**Side plate (for Energy Chains®)**

Unassembled **Part No. T802**

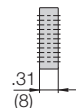
Assembled **Part No. T802 (M)**

**Side plate
T802**



- **Vertical separator 503**

This component is used to form the basic pattern of a shelf system.

**Vertical separator
(for Energy Chains®)**

Unassembled **Part No. 503**

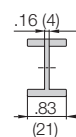
Assembled **Part No. 513**

**Vertical separator
503**



- **Locking vertical separator 507**

This separator features increased retention force for applications exposed to very high humidity and extreme loads. The extra retention force is achieved by asymmetric claws for the crossbar. Take care to ensure proper alignment.

**Locking vertical separator
(for Energy Chains®)**

Unassembled **Part No. 507**

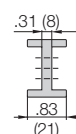
Assembled **Part No. 517**

**Locking vertical
separator
507**



- **Locking vertical separator 510**

This separator is slotted and able to be combined with shelves. For Energy Chains® only.

**Locking vertical separator
(for Energy Chains®)**

Unassembled **Part No. 510**

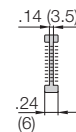
Assembled **Part No. 520**

**Locking vertical
separator
510**



- **Slotted separators 505**

These are used for very complex subdivisions. However, they cannot be retrofitted into an existing separation system without removing the shelves first.

**Slotted separators, closed
(for Energy Chains®)**

Unassembled **Part No. 505**

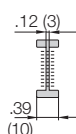
Assembled **Part No. 515**

**Closed slotted
separator
505**



- **Slotted separator 509**

This separator can be retrofitted into an existing interior separation system without removing the shelves, as long as these shelves fit into any of the 7 middle slots

**Slotted separators, open
(for Energy Chains®)**

Unassembled **Part No. 509**

Assembled **Part No. 519**

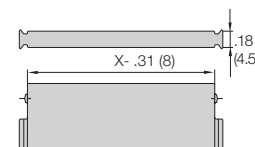
**Open slotted
separator
509**

**Shelves 420-XX**

These components form the basic pattern of a shelf system. Shelves of various widths can be arranged at 11 different heights in .28" (7mm) increments

Width X in. (mm)	Usable Width in. (mm)	Part No. Unassembled	Part No. Assembled
.71 (18)	.39 (10)	420-18	421-18
.91 (23)	.59 (15)	420-23	421-23
.98 (25)	.67 (17)	420-25	421-25
1.10 (28)	.79 (20)	420-28	421-28
1.30 (33)	.98 (25)	420-33	421-33
1.69 (43)	1.38 (35)	420-43	421-43
1.97 (50)	1.65 (42)	420-50	421-50
2.44 (62)	2.13 (54)	420-62	421-62

Width X in. (mm)	Usable Width in. (mm)	Part No. Unassembled	Part No. Assembled
2.95 (75)	2.64 (67)	420-75	421-75
3.46 (88)	3.15 (80)	420-88	421-88
3.94 (100)	3.62 (92)	420-100	421-100
4.92 (125)	4.61 (117)	420-125	421-125
5.91 (150)	5.59 (142)	420-150	421-150
6.89 (175)	6.57 (167)	420-175	421-175
7.36 (187)	7.05 (179)	420-187	421-187
7.87 (200)	7.56 (192)	420-200	421-200



Energy Chain system® E4-1

Series E4-80/H4-80/R4-80

Interior separation

energy chain® configurator



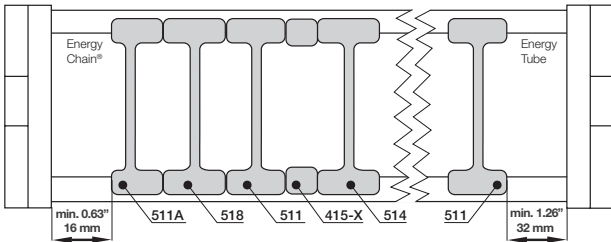
E4-80
H4-80
R4-80



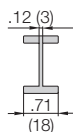
Vertical separators and spacers

Vertical separators are used if a vertical subdivision of the Energy Chain® interior is required. By standard, vertical separators are assembled every other Energy Chain® link.

NOTE: Observe a lateral spacing of at least 1.30 in. (33mm) for Energy Tubes and .63 in. (16mm) for Energy Chain®. There is no minimum spacing needed for side plates



Vertical separator
501



Vertical separator

Unassembled Part No. 501

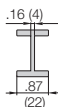
Assembled Part No. 511

- **Standard separator 501 for Energy Chains® and Energy Tubes**

This separator offers safe stability due to its wide base design, also when used with thick cables or hoses.



Locking separator
504



Locking separator (for Energy Chains®)

Unassembled Part No. 504

Assembled Part No. 514

- **Locking separator 504 for Energy Chains®**

This separator features increased retention force for applications exposed to very high humidity and extreme loads. If locking separators are used, the Energy Chain® is more difficult to open.



Locking separator
508



Locking separator (for Energy Chains®)

Unassembled Part No. 508

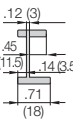
Assembled Part No. 518

- **Locking separator 508 for Energy Tubes**

This separator is used for applications that are exposed to extremely high humidity. The clamp at the side serves to uniformly align the separators. In order to avoid destroying the separators when opening the Energy Chain®, make sure all separators are identically aligned.



Asymmetrical separator
501A



Asymmetrical separator (for Energy Chains®)

Unassembled Part No. 501A

Assembled Part No. 511A

- **Asymmetrical separator 501A for Energy Chains®**

This separator is NOT for Energy Tubes. It features an (18mm) base and can be used in combinations between spacers of different widths and vertical separators in side mounted applications.



Spacers
405-XX



Spacer

(for Energy Chains®)

Unassembled Part No. 405-XX

Assembled Part No. 415-XX

XX = width of the spacer

- **NOTE ON SPACERS**

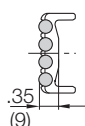
Vertical separators are adjustable, but can be fixed in position by means of a spacer. Spacers are most often necessary for side mounted applications. The available inner height is reduced by .08" (2mm) **per spacer** (for example if one spacer is placed on either side of the separator, the overall inner height is reduced by .16" (4mm). To avoid this, place the spacers on the **outside** of the opening crossbar (not for long travels).

Spacers available in the following sizes:

Part No. Unassembled	Part No. Assembled	in.	(mm)
405 -10	415 -10	.39"	(10)
405 -15	415 -15	.59"	(15)
405 -20	415 -20	.79"	(20)
405 -30	415 -30	1.18"	(30)
405 -40	415 -40	1.57"	(40)



Rollclip - minimizes abrasion of particularly sensitive hoses or cables in an Energy Chain®. The integrated rollers compensate for relative movement between the chain and the hose or cable. This reduces the abrasion of the hoses or cables



Rollclip

Unassembled Part No. 489-27

Assembled Part No. 490-27



PDF: www.igus.com/e-chain-pdfs
Specs/CAD/RFO: www.igus.com/e-chains
RoHS info: www.igus.com/RoHS



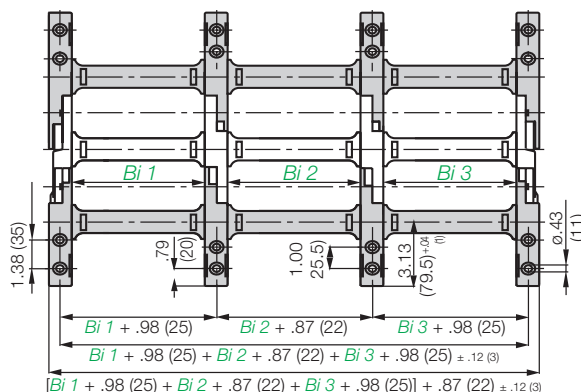


Part number example for
Energy Chain®

E4-80-10/20/10-200-0

E4-80-Bi1/Bi2/Bi3-R-0

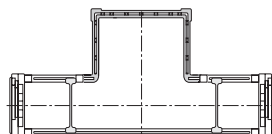
We **strongly recommend** on-site consultation with an igus® technician for individual advice regarding mounting brackets, guide troughs and other design details.



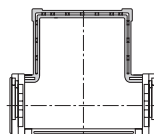
Consult igus® for your
extender crossbar
applications. We will be
happy to assist you with
your design layout.

Extender crossbars - For careful guiding of large diameter cables and hoses

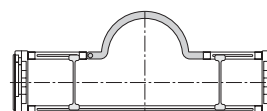
- Intended for cables and hoses with a maximum outer diameter of 10.63 in. (270 mm).
- Can be attached along either the inner or outer radius, inner radius preferred
- Gliding operation with crossbars assembled along the outer radius in conjunction with a special guide trough
- Gliding operation not guaranteed with crossbars assembled along the inner radius
- The extender crossbar can either be attached to the side links directly or can be used in combination with two standard snap-open crossbars.



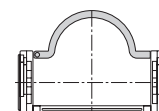
Square extender crossbar
combined with standard snap-
open crossbars.



Attached directly to
the side link.



Round extender crossbar
combined with standard snap-
open crossbars.



Attached directly to
the side link.

Part No.	Max Ø Hose	Style	Installation Side Link	Combined with Snap-Open Crossbars
450-15-RHD115	4.52 (115)	Round	No	Yes
450-17-RD115	4.52 (115)	Round	Yes	No
450-25-D150	5.91 (150)	Square	Yes	No
450-30-D200	7.87 (200)	Square	Yes	No
450-35-D250	8.66 (220)	Square	Yes	No
450-40-D300	10.63 (270)	Square	Yes	No
450-20-HD150	5.91 (150)	Square	No	Yes
450-25-HD200	7.87 (200)	Square	No	Yes
450-30-HD250	8.66 (220)	Square	No	Yes

E4 clip on cable binder

- For side mounted applications
- Serves as a clip-on, lateral guide for hoses and cables on Energy Chains®
- The loops can be adjusted as needed

- Compatible with many E4 Energy Chains®
- Economical
- One clip and one locking band are needed for each chain link



Part No.	Form
450-B12	Locking clip, comprised of a locking element
450-B12-200	Locking band, comprised of a locking element and band; 12 x 1.5 x 200 mm



Energy Chain system® E4-1

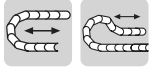
Series E4-80/H4-80/R4-80

Mounting Brackets KMA

energy chain® configurator

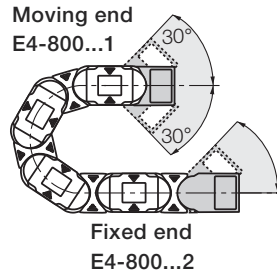
igus®

E4-80
H4-80
R4-80

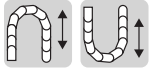
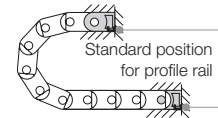


Option 1: pivoting

- Recommended for unsupported and gliding applications
- Attachment capability on all sides
- Bolted connection outside of chain cross-section
- Space restricted conditions
- Corrosion resistant

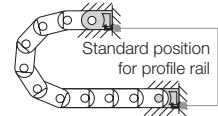
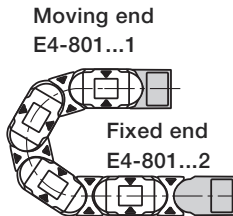


Standard



Option 2: locking

- Profile rail option
- Universal use
- Corrosion resistant
- Vertical hanging/standing travels
- Extreme accelerations



Part Number Structure

E4-800-07-12 P

With Profile Rail

Complete Set

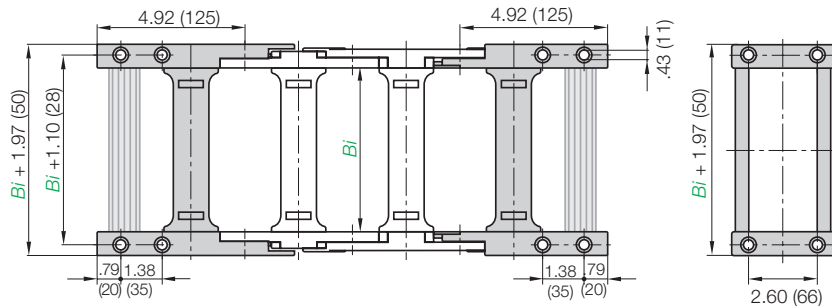
Width

E4-800 = Pivoting for chain

R4-800 = Pivoting for tube

E4-801 = Locking for chain

R4-801 = Locking for tube



Due to the design of the E4-80 series chains, please note the following when ordering brackets:

Even number of links = full set, part number ending in -12

Odd number of links = 2 pieces, part number ending in -2

Part number examples are shown for pivoting brackets for Energy Chain. For locking brackets change part number to 801

Part No. Full Set (pivoting)

Series E4-80 or H4-80

E4-800-Width-12

Part No. Full Set (pivoting)

with profile rail

Series E4-80 or H4-80

E4-800-Width-12P

Part No. Full Set (pivoting)

Tube Series R4-80

R4-800-Width-12

Part No. Full Set (pivoting)

with Profile Rail

Tube Series R4-80

R4-800-Width-12P

Width	Part No. Full Set chain/tube		With Profile Rail		Bi in. (mm)
	Pivoting	Locking			
-05*	E4-800	E4-801	-05-12	P	1.97 (50)
-06	E4-800	E4-801	-06-12	P	2.56 (65)
-07	E4-800	E4-801	-07-12	P	2.95 (75)
-08	E4-800	E4-801	-08-12	P	3.43 (87)
-10	E4-800	E4-801	-10-12	P	3.94 (100)
-11	E4-800	E4-801	-11-12	P	4.41 (112)
-12	E4-800	E4-801	-12-12	P	4.92 (125)
-13	E4-800	E4-801	-13-12	P	5.39 (137)
-15	E4-800	E4-801	-15-12	P	5.91 (150)
-16	E4-800	E4-801	-16-12	P	6.38 (162)
-17	E4-800	E4-801	-17-12	P	6.89 (175)
-18	E4-800	E4-801	-18-12	P	7.36 (187)
-20	E4-800/R4-800	E4-801/R4-801	-20-12	P	7.87 (200)
-21	E4-800	E4-801	-21-12	P	8.35 (212)
-22	E4-800	E4-801	-22-12	P	8.86 (225)
-23	E4-800	E4-801	-23-12	P	9.33 (237)
-25	E4-800/R4-800	E4-801/R4-801	-25-12	P	9.84 (250)
-26	E4-800	E4-801	-26-12	P	10.31 (262)
-27	E4-800	E4-801	-27-12	P	10.83 (275)
-28	E4-800	E4-801	-28-12	P	11.30 (287)
-30	E4-800/R4-800	E4-801/R4-801	-30-12	P	11.81 (300)

Width	Part No. Full Set chain/tube		With Profile Rail		Bi in. (mm)
	Pivoting	Locking			
-31	E4-800	E4-801	-31-12	P	12.28 (312)
-32	E4-800	E4-801	-32-12	P	12.79 (325)
-33	E4-800	E4-801	-33-12	P	13.27 (337)
-35	E4-800	E4-801	-35-12	P	13.78 (350)
-36	E4-800	E4-801	-36-12	P	14.25 (362)
-37	E4-800	E4-801	-37-12	P	14.76 (375)
-38	E4-800	E4-801	-38-12	P	15.24 (387)
-40	E4-800/R4-800	E4-801/R4-801	-40-12	P	15.75 (400)
-41	E4-800	E4-801	-41-12	P	16.22 (412)
-42	E4-800	E4-801	-42-12	P	16.73 (425)
-43	E4-800	E4-801	-43-12	P	17.20 (437)
-45	E4-800	E4-801	-45-12	P	17.72 (450)
-46	E4-800	E4-801	-46-12	P	18.19 (462)
-47	E4-800	E4-801	-47-12	P	18.70 (475)
-48	E4-800	E4-801	-48-12	P	19.17 (487)
-50	E4-800	E4-801	-50-12	P	19.69 (500)
-51	E4-800	E4-801	-51-12	P	20.16 (512)
-52	E4-800	E4-801	-52-12	P	20.67 (525)
-53	E4-800	E4-801	-53-12	P	21.14 (537)
-55	E4-800	E4-801	-55-12	P	21.65 (550)
-60	E4-800	E4-801	-60-12	P	23.62 (600)

PDF: www.igus.com/e-chain-pdfs
Specs/CAD/Rfq: www.igus.com/e-chains
RoHS info: www.igus.com/RoHS



Chainfix clamps for
the profile rail

igus® Chainfix strain relief elements are available in either steel or stainless steel. They can be adjusted with a hexagon socket and are available in single, double and triple configurations.

Part No. Single Clamp		Part No. Double Clamp		Part No. Triple Clamp		Cable ø	
Steel	Stainless	Steel	Stainless	Steel	Stainless	in.	(mm)
CFX12-1	CFX12-1E	CFX12-2	CFX12-2E	CFX12-3	–	.24 - .47	(06 - 12)
CFX14-1	CFX14-1E	CFX14-2	CFX14-2E	CFX14-3	–	.47 - .55	(12 - 14)
CFX16-1	CFX16-1E	CFX16-2	CFX16-2E	CFX16-3	–	.55 - .63	(14 - 16)
CFX18-1	CFX18-1E	CFX18-2	CFX18-2E	CFX18-3	–	.63 - .71	(16 - 18)
CFX20-1	CFX20-1E	CFX20-2	CFX20-2E	CFX20-3	–	.71 - .79	(18 - 20)
CFX22-1	CFX22-1E	CFX22-2	CFX22-2E	CFX22-3	–	.79 - .87	(20 - 22)
CFX26-1	CFX26-1E	CFX26-2	CFX26-2E	–	–	.87 - 1.02	(22 - 26)
CFX30-1	CFX30-1E	CFX30-2	CFX30-2E	–	–	1.02 - 1.18	(26 - 30)
CFX34-1	CFX34-1E	CFX34-2	CFX34-2E	–	–	1.18 - 1.34	(30 - 34)
CFX38-1	CFX38-1E	–	–	–	–	1.34 - 1.50	(34 - 38)
CFX42-1	CFX42-1E	–	–	–	–	1.50 - 1.65	(38 - 42)

For more information please refer to strain relief section of Chapter 10 in main catalog

Chainfix Clip

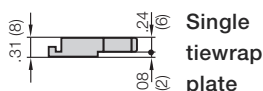
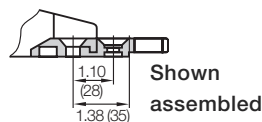


Modular snap-on strain relief device

Chainfix clips are available for cable diameters ranging from .16" (4mm) to .94" (24 mm). They are for assembly on KMA mounting brackets, clip-on strain relief for crossbars as well as profile rails. Quick assembly without the use of tools. **For more information please refer to strain relief section of Chapter 10 in main catalog**

Cable ø	Part No.	Part No.
in.	Clamp	Bottom
(mm)		
.16-.31	CFC-08-M	CFC-08-C
.31-.47	CFC-12-M	CFC-12-C
.47-.63	CFC-16-M	CFC-16-C
.63-.79	CFC-20-M	CFC-20-C
.79-.94	CFC-24-M	CFC-24-C

Tiewrap Plates

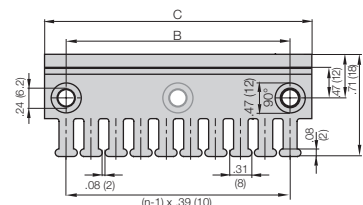


Option 1:

Tiewrap plates as an individual part

Available as an individual component, can be fixed onto a mounting bracket with the use of a profile rail.

Tiewrap Plate	n Number of Teeth	C Overall Width in. (mm)	B Bore Width in. (mm)	Center Bore
3050-ZB	5	1.97 (50)	1.18 (30)	no
3075-ZB	7	2.95 (75)	2.16 (55)	no
3100-ZB	10	3.94 (100)	3.15 (80)	no
3115-ZB	11	4.53 (115)	3.74 (95)	no
3125-ZB	12	4.92 (125)	4.13 (105)	no
3150-ZB	15	5.91 (150)	5.12 (130)	no
3175-ZB	17	6.89 (175)	6.10 (155)	no
3200-ZB	20	7.87 (200)	7.09 (180)	yes
3225-ZB	22	8.86 (225)	8.07 (205)	yes
3250-ZB	25	9.84 (250)	9.06 (230)	yes



If used with KMA brackets with profile rail please add "KMA" to the end of the part number.

Example: 3050-ZBKMA

For more information please refer to strain relief section of Chapter 10 in main catalog

Option 2:

Clip-on Tiewrap plates

Available as a clip-on tiewrap plate without the use of bolts. They are inserted and removed with a screwdriver used as a lever. Clip-on tiewrap plates are also available as an attachment to the opening crossbars.



Part No.	Number of Teeth	Width of Strain Relief in. (mm)
3050-ZC	5	1.97 (50)
3075-ZC	7	2.95 (75)

For more information please refer to strain relief section of Chapter 10 in main catalog

Energy Chain system® E4-1

Series E4-80/H4-80/R4-80

Guide Trough

energy chain® configurator

igus®

E4-80
H4-80
R4-80

Width of Crossbar
E4-80-05-200-0

	B_{Ri}	Installation Part No.
-05	4.13 (105)	96-50-225
-06	4.72 (120)	96-50-250
-07	5.12 (130)	96-50-250
-08	5.59 (142)	96-50-275
-10	6.10 (155)	96-50-275
-11	6.61 (168)	96-50-300
-12	7.09 (180)	96-50-300
-13	7.60 (193)	96-50-325
-15	8.07 (205)	96-50-325
-16	8.58 (218)	96-50-350
-17	9.06 (230)	96-50-350
-18	9.57 (243)	96-50-375
-20	10.04 (255)	96-50-375
-21	10.55 (268)	96-50-400
-22	11.02 (280)	96-50-400
-23	11.54 (293)	96-50-425
-25	12.01 (305)	96-50-425
-26	12.52 (318)	96-50-450
-27	12.99 (330)	96-50-450
-28	13.50 (343)	96-50-475
-30	13.98 (355)	96-50-475
-31	14.49 (368)	96-50-500
-32	14.96 (380)	96-50-500
-33	15.47 (393)	96-50-525
-35	15.94 (405)	96-50-525
-36	16.46 (418)	96-50-550
-37	16.93 (430)	96-50-550
-38	17.44 (443)	96-50-575
-40	17.91 (455)	96-50-575
-41	18.43 (468)	96-50-600
-42	18.90 (480)	96-50-600
-43	19.41 (493)	96-50-625
-45	19.88 (505)	96-50-625
-46	20.39 (518)	96-50-650
-47	20.87 (530)	96-50-650
-48	21.38 (543)	96-50-675
-50	21.85 (555)	96-50-675
-51	22.36 (568)	96-50-700
-52	22.83 (580)	96-50-700
-53	23.35 (593)	96-50-725
-55	23.82 (605)	96-50-725
-60	25.79 (655)	96-50-775

Guide troughs are used with applications where the upper run of the Energy Chain® glides on the lower run. If using igus® steel guide troughs, the following components are required:

- Full travel length of guide trough
Part No. 99-30
- 1/2 travel length glide bars
Part No. 93-01
- Installation sets as end connectors
Part No. 96-50-XX

-XX indicates the length of the profile rails on which the guide trough is mounted. The values and part numbers are specified in the table on the right. The standard length of the trough components and glide bars is 6.56 ft (2 m). The overall length of the guide trough directly correlates to the length of travel.

Example:

Length of travel 164 ft (50 m)
Center-mounted

Required guide troughs:

164 ft (50 m) guide trough, 82 ft. (25 m) glide bar

= 25 sections of 6.56 ft (2 m) guide trough

Part No. 99-30

= 13 sections of 6.56 ft (2 m) glide bar

Part No. 93-01

Required number of installation set:

= Number of guide trough components + 1

= 25 + 1 = 26

Part No. of the installation sets **96-50-XXX**

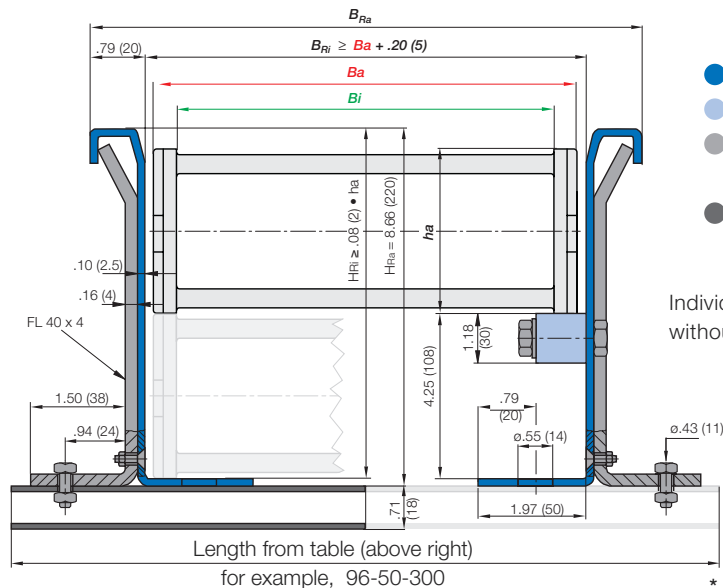
Example: 96-50-400 for 15.75 (400 mm) long profile rail



Left: Guide trough with glide bars
Right: Guide troughs without glide bars



Installation sets as section connectors



* Specialized guide trough available upon request

Standard length profile rail

For further technical
information on guide troughs
► Chapter 9

PDF: www.igus.com/e-chain-pdfs
Specs/CAD/RFQ: www.igus.com/e-chains
RoHS info: www.igus.com/RoHS



Price Index



Series 840

Special Options Available



ESD classification:
Electrically conductive
ESD/ATEX version upon request

Assembly Tips



Opening Energy Chains®: Remove cross-bars and clips - Insert screwdriver into the slot, push down, release by lever action

Other Installation Methods

Vertical, hanging ≤ 394 ft (120 m)

Vertical, standing ≤ 19.69 ft (6 m)

Side-mounted, unsupp. ≤ 19.69 ft (6 m)

Rotary requires further calculation

Usage Guidelines



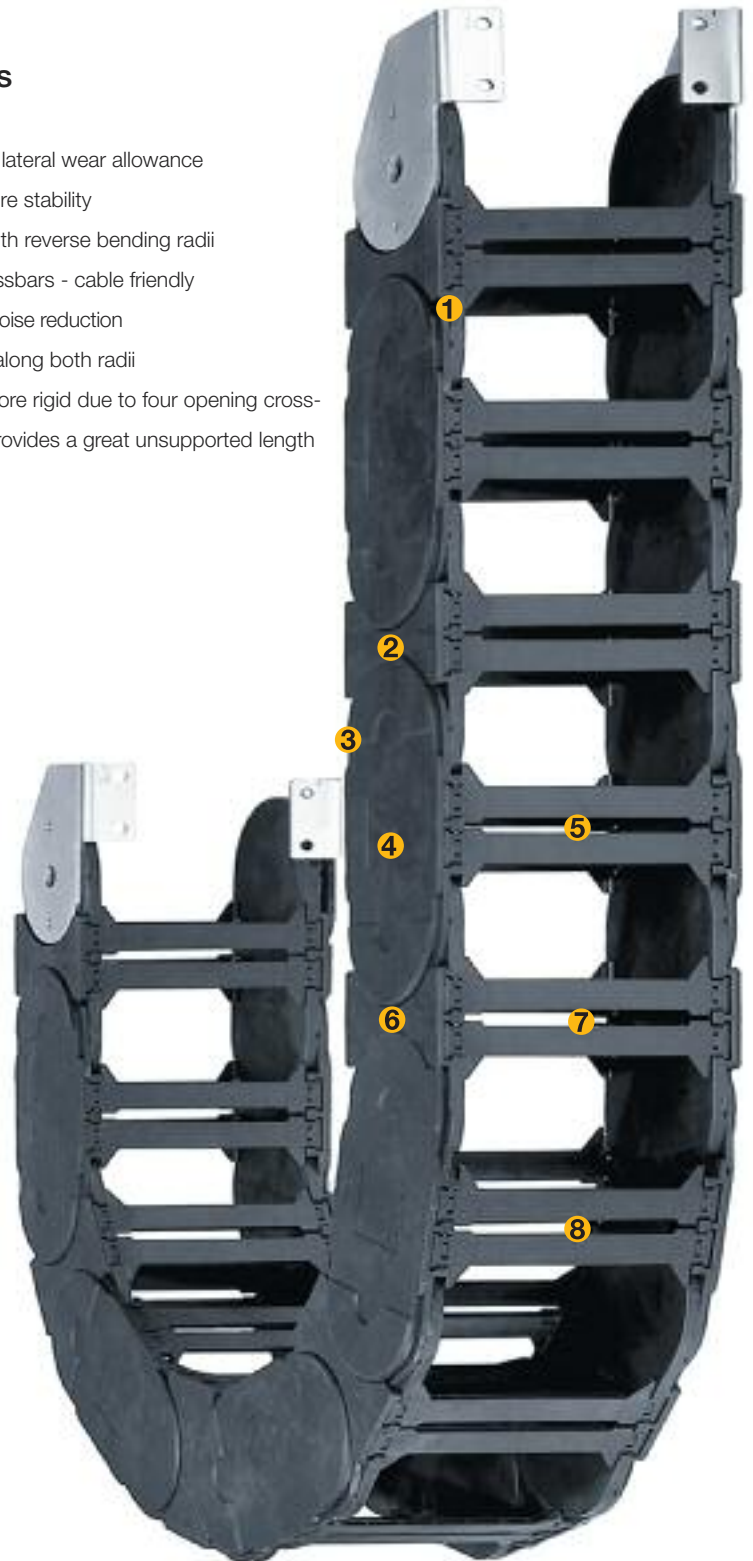
- If a particularly big and stable Energy Chain® is required
- At very high speeds and/or accelerations
- For long travels
- For high additional loads
- Large cable/hose diameters



- If a more stable Energy Chain® with identical inner height is required
➤ Series 800

Features & Benefits

- 1 Dirt-repellent exterior
- 2 Optimized glide pads with lateral wear allowance
- 3 Tongue and groove for more stability
- 4 Energy Chain® available with reverse bending radii
- 5 Wide, rounded plastic crossbars - cable friendly
- 6 Stop dog with "brake" for noise reduction
- 7 Crossbars are removable along both radii
- 8 Each chain link is made more rigid due to four opening cross-bars, and consequently provides a great unsupported length



Order Example: Complete Energy Chain®

Please indicate chain length or number of links. Example:

23 ft (7 m) **840-30-350-0**



Energy Chain®

With 2 separators **8411** assembled every 2nd link



Interior Separation

1 Set **8000-12**



Mounting Bracket

Energy Chain system® Series 840 Installation Dimensions

energy chain® configurator ►

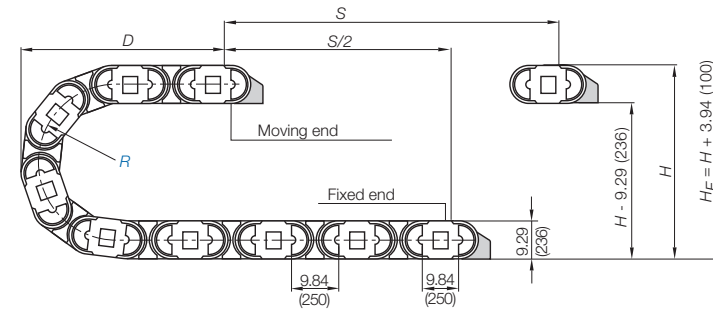
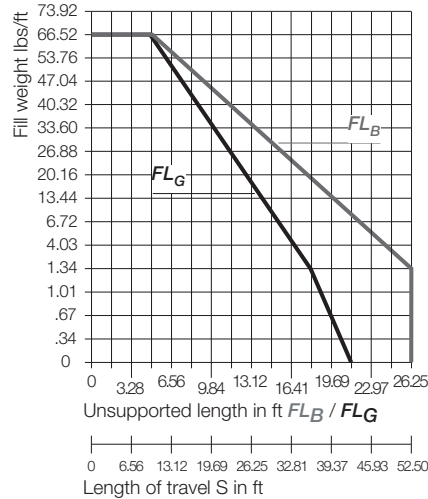
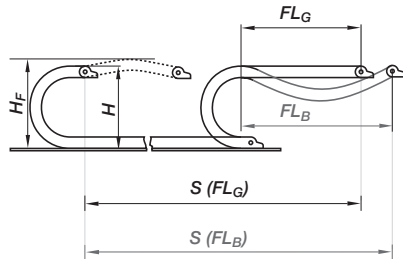
igus®

840

Short travel, unsupported length

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

Further information ► Design, Chapter 1, main catalog



Pitch per link = 9.84" (250 mm)
Links per ft (m) = 1.22 (4)
For center mount applications:
Chain length = $\frac{S}{2} + K$

The required clearance height: $H_F = H + 3.94$ in. (100 mm) (with 3.36 lbs/ft (5 kg/m) fill weight. Please consult igus® if space is particularly restricted.

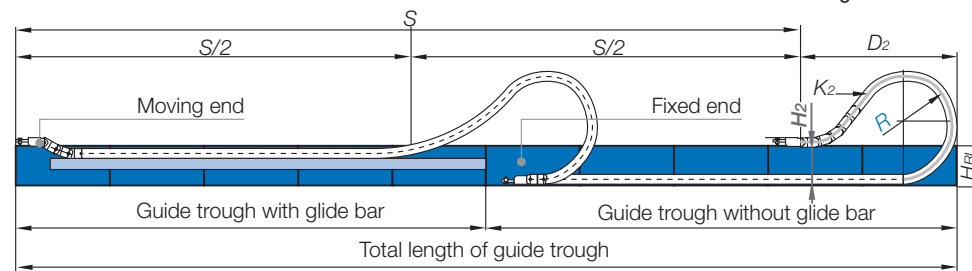
R	12.80 (325)	13.78 (350)	15.75 (400)	17.72 (450)	19.69 (500)	23.62 (600)	29.53 (750)	39.37 (1000)
H*	34.88 (886)	36.85 (936)	40.79 (1036)	44.72 (1136)	48.66 (1236)	56.53 (1436)	68.34 (1736)	88.03 (2236)
D	28.54 (725)	29.53 (750)	31.50 (800)	33.46 (850)	35.43 (900)	39.37 (1000)	45.27 (1150)	55.12 (1400)
K	60.04 (1525)	62.99 (1600)	69.29 (1760)	75.39 (1915)	81.69 (2075)	93.90 (2385)	112.60 (2860)	143.50 (3645)

For long travels with lowered mounting height

Please consult igus® when choosing to use a lowered mounting height with this series

Long travel lengths from 32.8 ft. (10 m) to max. 1,476 ft. (450 m)

For center mount applications:
Chain length = $\frac{S}{2} + K_2$



Long Travels - Gliding



If the unsupported length is exceeded, the Energy Chain®/Tube must glide on itself. This requires a guide trough.

Design, Chapter 1, main catalog

Technical Data



Details of material properties

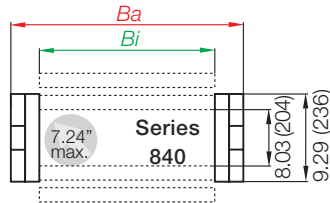
► Chapter 1, main catalog

Speed / acceleration FL_G	max. 65.6 ft/s (20 m/s) / max. 656 ft/s² (200 m/s²)
Speed / acceleration FL_B	max. 9.84 ft/s (3 m/s) / max. 19.69 ft/s² (6 m/s²)
Gliding speed / acceleration (maximum)	max. 32.8 ft/s (10 m/s) / max. 164 ft/s² (50 m/s²)
Material - permitted temperature	igumid G / -40°F (-40°C) up to +248°F (+120°C)
Flammability Class, igumid G	VDE 0304 IIC UL94 HB

PDF: www.igus.com/e-chain-pdfs
Specs/CAD/RFQ: www.igus.com/e-chains
RoHS info: www.igus.com/RoHS

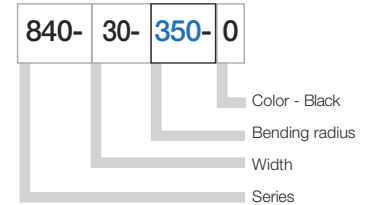


Series 840 - Energy Chain® with crossbars every link



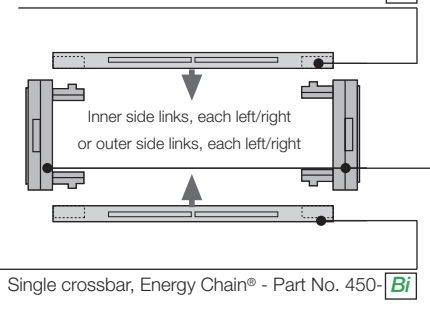
- Crossbars every link
- For use with rigid hydraulic hoses
- For particularly demanding applications
- Can be opened from both sides

Part Number Structure



Energy Chain® as separate parts, links and side plates

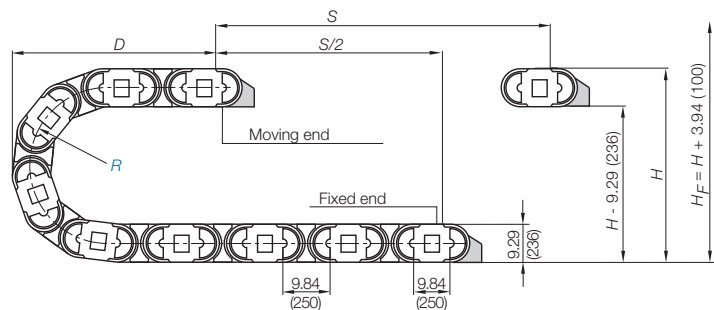
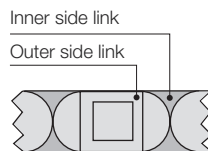
Single crossbar, Energy Chain® - Part No. 450-**Bi**



Single crossbar, Energy Chain® - Part No. 450-**Bi**

Outer side link, single part - Part No. 800-01
(Suitable for all radii)

Inner side link, single part - Part No. 800-02-**R**



Supplement part number with required radius. Example: 840-30-350-0

Pitch: 9.84 in. (250 mm) per link links/ft(m) = 1.22 (4)

Part Number.				
Crossbars		<i>Bi</i>	<i>Ba</i>	840
Every link		in. (mm)	in. (mm)	lbs/ft (kg/m)
840-13-	-0	3.94 (100)	6.30 (160)	≈ 9.30 (13.84)
840-15-	-0	4.45 (113)	6.81 (173)	≈ 9.32 (13.87)
840-16-	-0	4.92 (125)	7.28 (185)	≈ 9.37 (13.95)
840-17-	-0	5.43 (138)	7.80 (198)	≈ 9.43 (14.04)
840-18-	-0	5.91 (150)	8.27 (210)	≈ 9.49 (14.13)
840-20-	-0	6.42 (163)	8.78 (223)	≈ 9.52 (14.17)
840-21-	-0	6.89 (175)	9.25 (235)	≈ 9.56 (14.22)
840-22-	-0	7.40 (188)	9.76 (248)	≈ 9.59 (14.27)
840-23-	-0	7.87 (200)	10.24 (260)	≈ 9.64 (14.35)
840-25-	-0	8.38 (213)	10.75 (273)	≈ 9.70 (14.43)
840-26-	-0	8.86 (225)	11.22 (285)	≈ 9.74 (14.49)
840-27-	-0	9.37 (238)	11.73 (298)	≈ 9.79 (14.57)
840-28-	-0	9.84 (250)	12.20 (310)	≈ 9.82 (14.61)
840-30-	-0	10.35 (263)	12.72 (323)	≈ 9.89 (14.72)
840-31-	-0	10.83 (275)	13.19 (335)	≈ 9.91 (14.75)
840-32-	-0	11.34 (288)	13.70 (348)	≈ 9.96 (14.82)
840-33-	-0	11.81 (300)	14.17 (360)	≈ 10.02 (14.91)
840-35-	-0	12.32 (313)	14.69 (373)	≈ 10.12 (15.06)
840-36-	-0	12.80 (325)	15.16 (385)	≈ 10.14 (15.09)
840-37-	-0	13.31 (338)	15.67 (398)	≈ 10.15 (15.11)
840-38-	-0	13.78 (350)	16.14 (410)	≈ 10.18 (15.15)
840-40-	-0	14.29 (363)	16.65 (423)	≈ 10.31 (15.34)
840-41-	-0	14.76 (375)	17.13 (435)	≈ 10.34 (15.39)
840-42-	-0	15.28 (388)	17.64 (448)	≈ 10.42 (15.50)
840-43-	-0	15.75 (400)	18.11 (460)	≈ 10.46 (15.57)
840-45-	-0	16.26 (413)	18.62 (473)	≈ 10.50 (15.63)
840-46-	-0	16.73 (425)	19.09 (485)	≈ 10.54 (15.69)
840-47-	-0	17.24 (438)	19.61 (498)	≈ 10.56 (15.72)
840-48-	-0	17.72 (450)	20.08 (510)	≈ 10.62 (15.80)
840-50-	-0	18.23 (463)	20.59 (523)	≈ 10.66 (15.87)
840-51-	-0	18.70 (475)	21.06 (535)	≈ 10.69 (15.91)
840-52-	-0	19.21 (488)	21.57 (548)	≈ 10.70 (15.93)
840-53-	-0	19.69 (500)	22.05 (560)	≈ 10.75 (16.00)
840-55-	-0	20.20 (513)	22.56 (573)	≈ 10.96 (16.31)
840-60-	-0	22.17 (563)	24.53 (623)	≈ (11.07 16.47)

Choose from the radii below for all of the above sizes

Radius (mm) Example: 840-30-350-0

	325	350	400	450	500	600	750	1000
R	12.80 (325)	13.78 (350)	15.75 (400)	17.72 (450)	19.69 (500)	23.62 (600)	29.53 (750)	39.37 (1000)
H*	34.88 (886)	36.85 (936)	40.79 (1036)	44.72 (1136)	48.66 (1236)	56.53 (1436)	68.34 (1736)	88.03 (2236)
D	28.54 (725)	29.53 (750)	31.50 (800)	33.46 (850)	35.43 (900)	39.37 (1000)	45.27 (1150)	55.12 (1400)
K	60.04 (1525)	62.99 (1600)	69.29 (1760)	75.39 (1915)	81.69 (2075)	93.90 (2385)	112.60 (2860)	143.50 (3645)

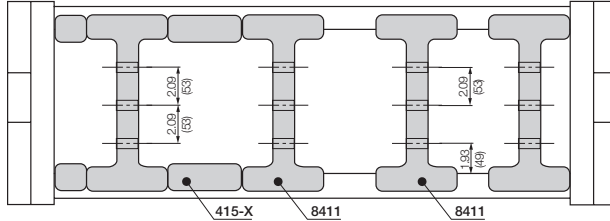
0 = Standard color black. For other colors see Chapter 1, main catalog



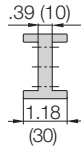


Vertical separators and spacers

Vertical separators are used if a vertical subdivision of the Energy Chain® interior is required. By standard, vertical separators are assembled every other Energy Chain® link.



Vertical separator
8401



Vertical separator

Unassembled	Part No. 8401
Assembled	Part No. 8411



Spacers
405-XX



Spacer (chain only)

Unassembled	Part No. 405.XX
Assembled	Part No. 415.XX

Spacers available in the following sizes:

Part No. Unassembled	Part No. Assembled	in.	(mm)
405 -10	415 -10	.39"	(10)
405 -15	415 -15	.59"	(15)
405 -20	415 -20	.79"	(20)
405 -30	415 -30	1.18"	(30)
405 -40	415 -40	1.57"	(40)

- **Standard separator 8401 for Energy Chains®**

This separator offers safe stability due to its wide base design, also when used with thick cables or hoses.

- **NOTE ON SPACERS**

Vertical separators are adjustable, but can be fixed in position by means of a spacer. Spacers are most often necessary for side mounted applications. The available inner height is reduced by .08" (2mm) **per spacer** (for example if one spacer is placed on either side of the separator, the overall inner height is reduced by .16" (4mm)). To avoid this, place the spacers on the **outside** of the opening crossbar (**not for long travels**).

Energy Chain system® E4

Series 840

Mounting Brackets

energy chain® configurator

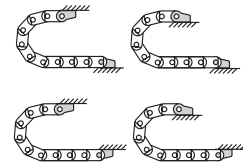
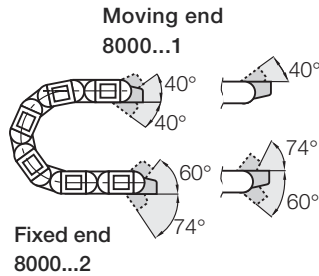
igus®

840

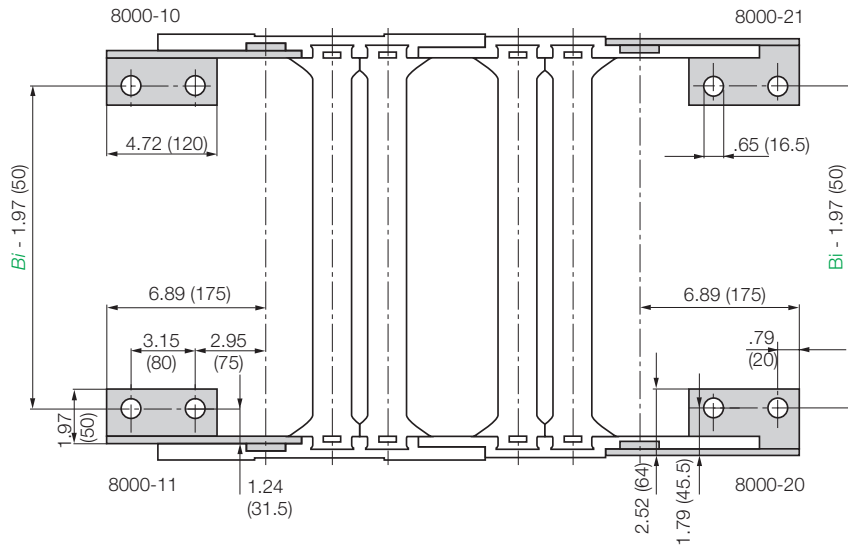


Option 1: pivoting

- For pivoting connections
- One part for all chain widths
- Electrically conductive



Possible installation configurations -



Part No.	Mounting bracket
8000-12	Full set
8000-1	Mounting bracket set moving end (one side) for outer side link
8000-2	Mounting bracket set fixed end (one side) for inner side link

Due to the design of the E4/100 series chains, please note the following when ordering brackets:

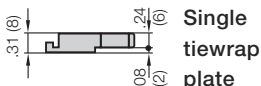
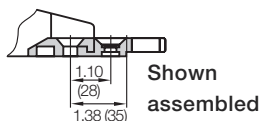
Even number of links = full set, part number ending in -12
Odd number of links = 2 pieces, part number ending in -2

PDF: www.igus.com/e-chain-pdfs
Specs/CAD/RFQ: www.igus.com/e-chains
RoHS info: www.igus.com/RoHS

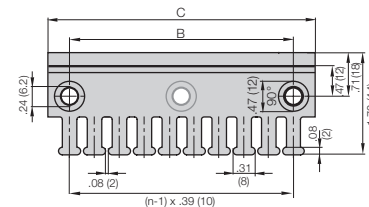
Strain Relief

Tiewrap plates as an individual part

Available as an individual component, can be fixed onto a mounting bracket with the use of a profile rail.



Tiewrap Plate	n Number of Teeth	C Overall Width in. (mm)	B Bore Width in. (mm)	Center Bore
3050-ZB	5	1.97 (50)	1.18 (30)	no
3075-ZB	7	2.95 (75)	2.16 (55)	no
3100-ZB	10	3.94 (100)	3.15 (80)	no
3115-ZB	11	4.53 (115)	3.74 (95)	no
3125-ZB	12	4.92 (125)	4.13 (105)	no
3150-ZB	15	5.91 (150)	5.12 (130)	no
3175-ZB	17	6.89 (175)	6.10 (155)	no
3200-ZB	20	7.87 (200)	7.09 (180)	yes
3225-ZB	22	8.86 (225)	8.07 (205)	yes
3250-ZB	25	9.84 (250)	9.06 (230)	yes



For more information please refer to strain relief section of Chapter 10 in main catalog

Width of Crossbar
 840-20-200-0

	B_{RI}	Installation Part No.
-13	6.49 (165)	90-50-350
-15	7.01 (178)	90-50-350
-16	7.48 (190)	90-50-375
-17	7.99 (203)	90-50-375
-18	8.46 (215)	90-50-400
-20	8.98 (228)	90-50-400
-21	9.45 (240)	90-50-425
-22	9.96 (253)	90-50-425
-23	10.43 (265)	90-50-450
-25	10.94 (278)	90-50-450
-26	11.42 (290)	90-50-475
-27	11.93 (303)	90-50-475
-28	12.40 (315)	90-50-500
-30	12.91 (328)	90-50-500
-31	13.39 (340)	90-50-525
-32	13.90 (353)	90-50-525
-33	14.37 (365)	90-50-550
-35	14.88 (378)	90-50-550
-36	15.35 (390)	90-50-575
-37	15.87 (403)	90-50-575
-38	16.34 (415)	90-50-600
-40	16.85 (428)	90-50-600
-41	17.32 (440)	90-50-625
-42	17.83 (453)	90-50-625
-43	18.31 (465)	90-50-650
-45	18.82 (478)	90-50-650
-46	19.29 (490)	90-50-675
-47	19.80 (503)	90-50-675
-48	20.20 (513)	90-50-700
-50	20.79 (528)	90-50-700
-51	21.26 (540)	90-50-725
-52	21.77 (553)	90-50-725
-53	22.24 (565)	90-50-750
-55	22.76 (578)	90-50-750
-60	26.18 (665)	90-50-800

Guide troughs are used with applications where the upper run of the Energy Chain® glides on the lower run. If using igus® steel guide troughs, the following components are required:

- Full travel length of guide trough
Part No. 90-30
- 1/2 travel length glide bars
Part No. 90-31
- Installation sets as end connectors
Part No. 90-50-XX

-XX indicates the length of the profile rails on which the guide trough is mounted. The values and part numbers are specified in the table on the right. Standard length of the trough components and glide bars is 6.56 ft (2m). The required overall length of the guide trough directly correlates to the length of travel.

Example:

Length of travel 164 ft (50m)
Center mounted

Required guide troughs:

- 164 ft (50 m) guide trough
82 ft (25 m) glide bars
- = 25 sections of (2 m) guide trough without glide bars **Part No. 90-30**
 - = 13 section of (2 m) guide troughs with glide bars **Part No. 90-31**

Required number of installation sets:

- = Number of guide trough components + 1
- = 25 + 1 = 26

Part number of the installation sets

90-50-XXX

Example:

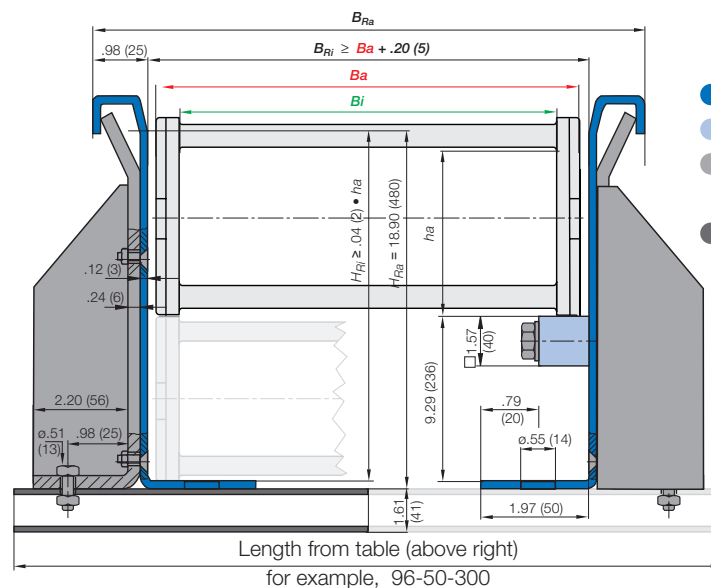
90-50-400 for (400 m) long profile rail



Left: Guide trough with glide bars
Right: Guide troughs without glide bars



Installation sets as section connectors



Individual attachment without profile rail

* Specialized guide trough available upon request

For further technical information on guide troughs
➤ Chapter 9

