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

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 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. ≤ 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:

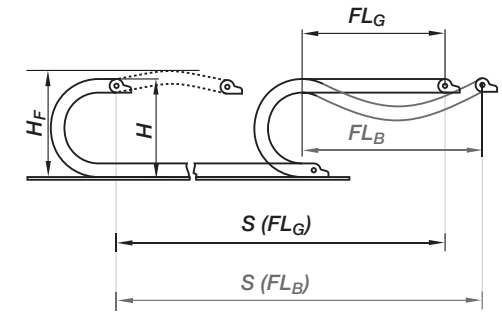
9.84 ft (3 m) **E4-56-30-300-0**	**Energy Chain®**
With 2 separators **411** assembled every 2nd link	**Interior Separation**
1 Set **E4-560-30-12P**	**Mounting Bracket**

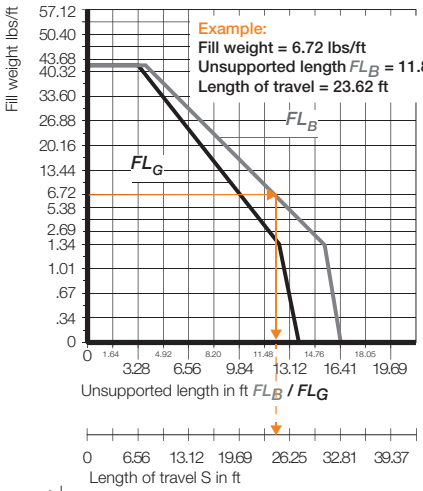
Energy Chain system® E4-1
Series E4-56/H4-56/R4-56
Installation Dimensions

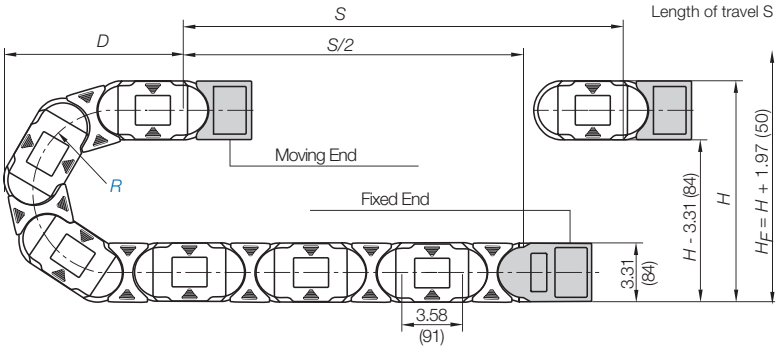
Short travel, unsupported length

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

Further information ➤ Design, Chapter 1, main catalog







Pitch per link: = 3.58" (91 mm)
Links per ft (m): = 3.35 (11)
For center mount applications:
Chain length = $S/2 + K$

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.

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

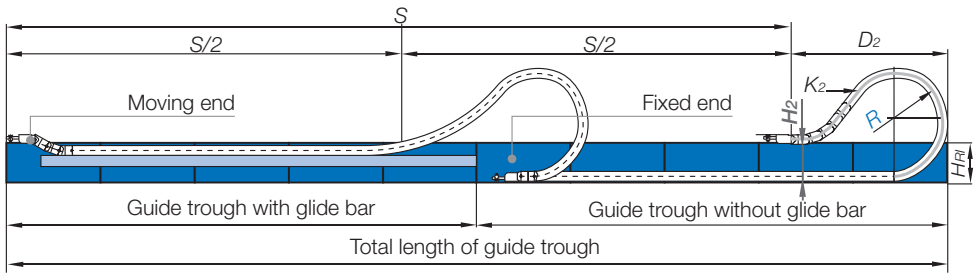
S = Length of travel
R = Bending radius
H = Nominal clearance height
D = Overlength Energy Chain® radius in final position
$K = \pi \bullet R +$ *safety buffer*
H_F = Required clearance height
H_{RI} = Trough inner height
H_2 = *Mounting height
D_2 = Overlength - long travels, gliding
K_2 = *Add-on
*If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

R	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^{+0}_{+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: = $S/2 + K_2$



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

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**

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, main catalog

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

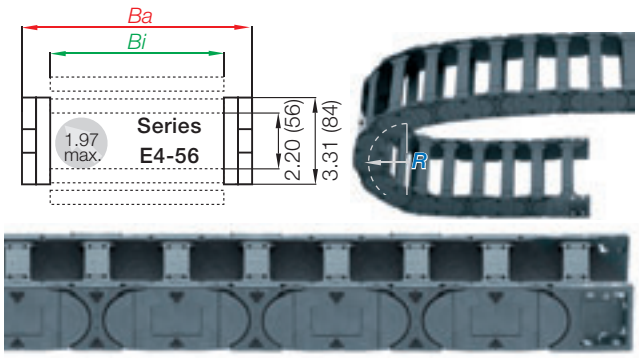
Energy Chain system® E4-1
Series E4-56/H4-56/R4-56
Product Range

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

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



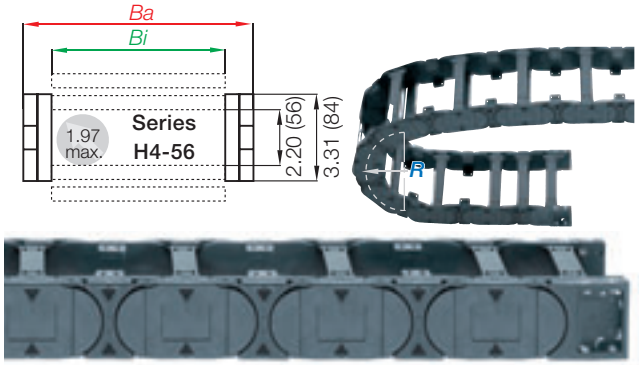
- Crossbars every link
- For use with rigid hydraulic hoses
- For particularly demanding applications
- Can be opened from both sides

Part Number Structure

E4-56-	13-	250-	0

Color - Black
Bending radius
Width
Series

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



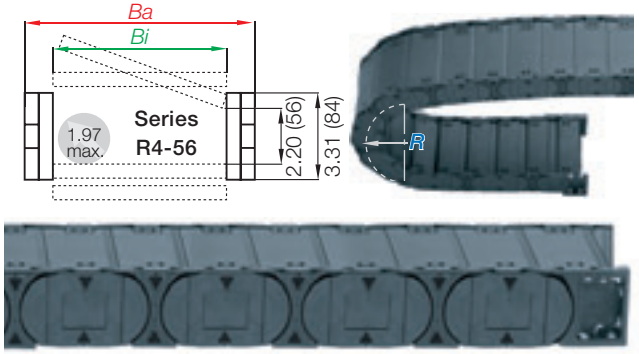
- Crossbars every other link
- Standard configuration
- For nearly every situation
- Can be opened from both sides
- Easy assembly
- Stable
- Cost-effective

Part Number Structure

H4-56-	13-	250-	0

Color - Black
Bending radius
Width
Series

Series R4-56 - fully enclosed Energy Tube



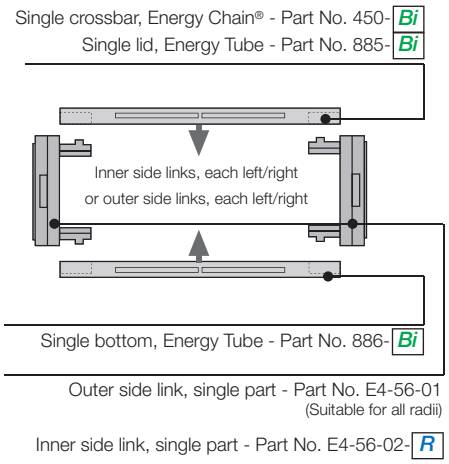
- Fully enclosed
- Excellent cable and hose protection against dirt
- Protection against hot chips
- Lids along inner radius are completely removable
- Lids along the outer radius are single-sided, snap open, hinged on one side as well as completely removable

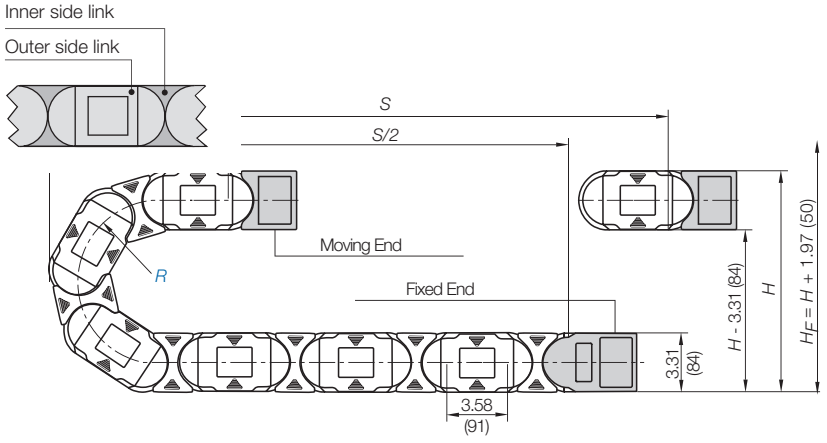
Part Number Structure

R4-56-	25-	250-	0

Color - Black
Bending radius
Width
Series

Energy Chain® as separate parts, links and side plates





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

Part Number					Bi	Ba	Weight		
Crossbars Every link	Crossbars Every other	Tube Version			in. (mm)	in. (mm)	E4-56 lbs/ft (kg/m)	H4-56 lbs/ft (kg/m)	R4-56 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: E4-56-30-300-0

	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*$^{\circ}_{+25}$	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 6.49. For large diameter hoses see page 6.49

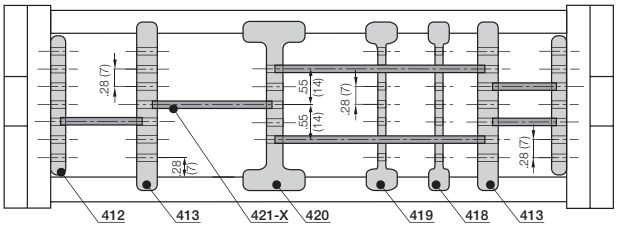
PDF: www.igus.com/e-chain-pdfs
Specs/CAD/RFQ: www.igus.com/e-chains
RoHS info: www.igus.com/RoHS

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

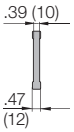
Shelves and separators

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.



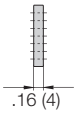
- **Split separator T563 for Energy Chains®**
  This separator is ideal for subsequent shelving or the initial assembly of the Energy Chain. Fast assembly and disassembly using a hinge/push mechanism. Enhances flexibility



Split separator (chain only)	
Unassembled	**Part No. T563**
Assembled	**Part No. T563M**

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

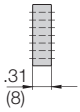
- **Side plates 402**
  This component is used to form the basic pattern of a shelf system.



Side plate	
Unassembled	**Part No. 402**
Assembled	**Part No. 412**

Side plate 402

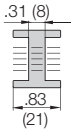
- **Vertical separator 403**
  This component is used to form the basic pattern of a shelf system.



Vertical separator	
Unassembled	**Part No. 403**
Assembled	**Part No. 413**

Vertical separator 403

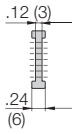
- **Locking vertical separator 410**
  This separator is slotted and able to be combined with shelves. For Energy Chains® only



Locking vertical separator	
Unassembled	**Part No. 410**
Assembled	**Part No. 420**

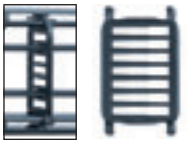
Locking vertical separator 410

- **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.

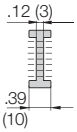


Slotted separators, closed	
Unassembled	**Part No. 408**
Assembled	**Part No. 418**

Closed slotted separator 408

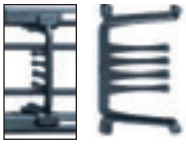


- **Slotted separator 409**
  This separator can be retrofitted into an existing interior separation system without removing the shelves, as long as these shelves fit into any of the 3 middle slots



Slotted separators, open	
Unassembled	**Part No. 409**
Assembled	**Part No. 419**

Open slotted separator 409

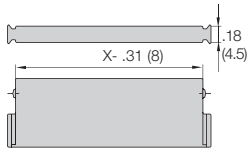


Shelves 420-XX

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.	Width X (mm)	Usable Width in.	Usable Width (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.	Width X (mm)	Usable Width in.	Usable Width (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**



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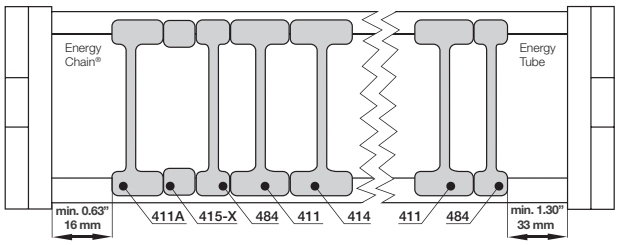
Energy Chain system® E4-1
Series E4-56/H4-56/R4-56
Interior Separation

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

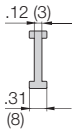


Vertical separator 401

Vertical separator	
Unassembled	**Part No. 401**
Assembled	**Part No. 411**

- **Standard separator 401 for Energy Chains® and Energy Tubes**
  This separator offers safe stability due to its wide base design.

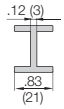
Vertical separator 483



Vertical separator	
Unassembled	**Part No. 483**
Assembled	**Part No. 484**

- **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.

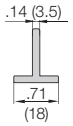
Locking separator 404



Locking separator (chain only)	
Unassembled	**Part No. 404**
Assembled	**Part No. 414**

- **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.

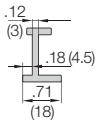
Locking separator 406



Locking separator (tube only)	
Unassembled	**Part No. 406**
Assembled	**Part No. 416**

- **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

Asymmetric separator 401A



Asymmetrical separator (chain only)	
Unassembled	**Part No. 401A**
Assembled	**Part No. 411A**

- **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.

Spacers 405-XX

XX = width of the spacer

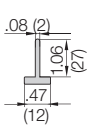
Spacer (chain only)	
Unassembled	**Part No. 405-XX**
Assembled	**Part No. 415-XX**

- **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:

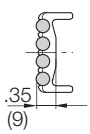
Part No. Unassembled	Part No. Assembled	in.	(mm)
405 -10	415 -10	.39"	(10)
405 -15	415 -15	.59"	(15)
405 -20	415 -20	.79"	(20)
405 -30	415 -30	1.18"	(30)
405 -40	415 -40	1.57"	(40)

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



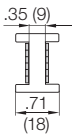
Center crossbar	
Unassembled	**Part No. 405**
Assembled	**Part No. 415**

Rollclip - minimizes abrasion of particularly sensitive hoses or cables.The integrated rollers compensate for relative movement between the chain and the hose or cable.



Rollclip	
Unassembled	**Part No. 489-27**
Assembled	**Part No. 490-27**

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



Center crossbar	
Unassembled	**Part No. 429**
Assembled	**Part No. 430**

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

igus® Energy Chain System®
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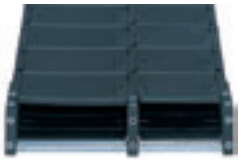
QuickSpec: http://www.igus.com/quickspec

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



Part number example for Energy Chain®

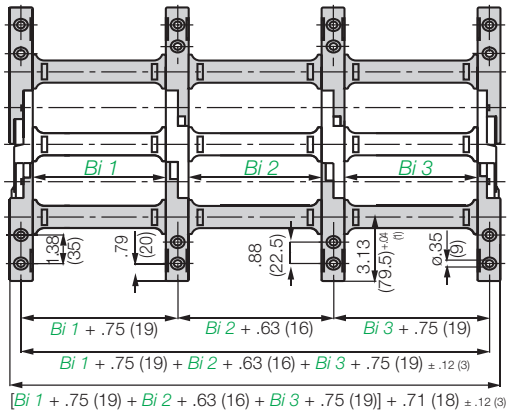
E4-56-10/20/10- 200 **-0**

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.

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

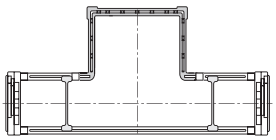
- For applications in which particularly high fill weights necessitate extremely wide Energy Chains®
- The extension link design allows virtually limitless side-by-side attachment of chains
- The unsupported length of a chain can be increased when additional loads are required
- Extension links can be 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.



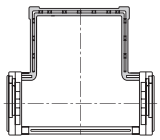
Consult igus® for your extender crossbar applications. We will be happy to assist you with your design layout.

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

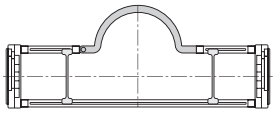
- Intended for cables and hoses with a maximum outer diameter of 9.65 in. (245 mm).
- Can be attached along either the inner or outer radius, inner radius preferred
- Gliding operation with crossbars assembled along the outer radius in conjunction with a special guide trough
- Gliding operation not guaranteed 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.



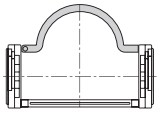
Square extender crossbar combined with standard snap-open crossbars.



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

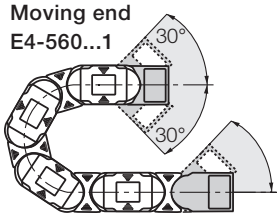
Energy Chain system® E4-1
Series E4-56/H4-56/R4-56
Mounting Brackets

Option 1: pivoting

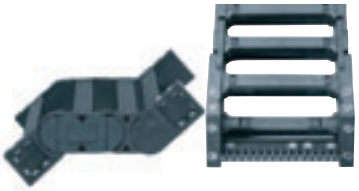
Standard

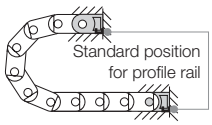
- Recommended for unsupported and gliding applications
- Attachment capability on all sides
- Bolted connection outside of chain cross-section
- Space restricted conditions
- Corrosion resistant

Moving end
E4-560...1



Fixed end
E4-560...2

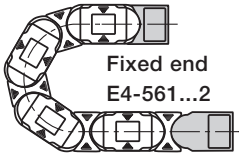




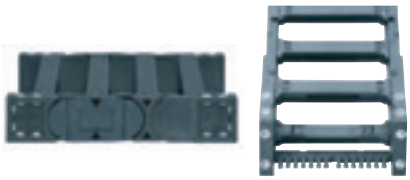
Option 2: locking

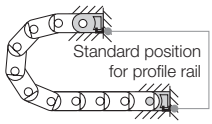
- Profile rail option
- Universal use
- Corrosion resistant
- Vertical hanging/standing travels
- Extreme accelerations

Moving end
E4-561...1

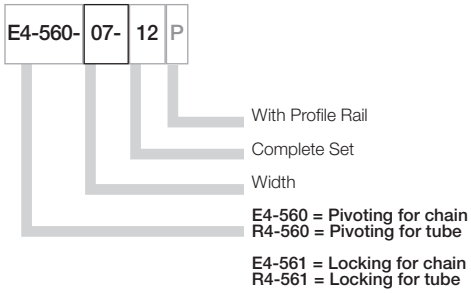


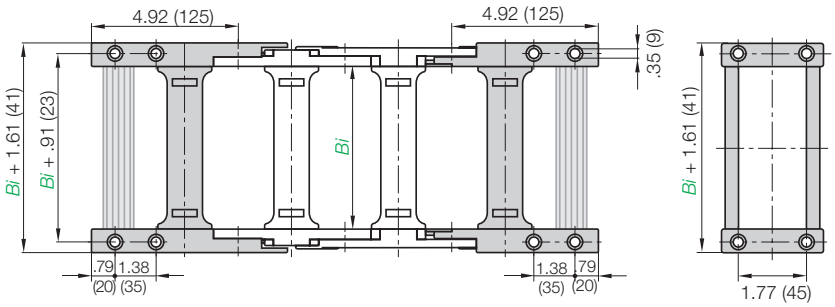
Fixed end
E4-561...2





Part Number Structure





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 **-1**

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 Pivoting	Locking		With Profile Rail	*Bi* in. (mm)
-05*	E4-560	E4-561	-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/R4-560	E4-561/R4-561	-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/R4-560	E4-561/R4-561	-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)

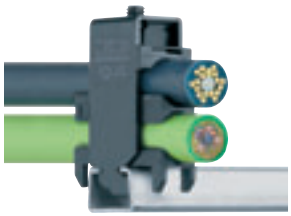
Width	Part No. Full Set chain/tube Pivoting	Locking		With Profile Rail	*Bi* in. (mm)
-31	E4-560	E4-561	-31-12	P	12.28 (312)
-32	E4-560	E4-561	-32-12	P	12.79 (325)
-33	E4-560	E4-561	-33-12	P	13.27 (337)
-35	E4-560/R4-560	E4-561/R4-561	-35-12	P	13.78 (350)
-36	E4-560	E4-561	-36-12	P	14.25 (362)
-37	E4-560	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

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

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

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	(6 - 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.

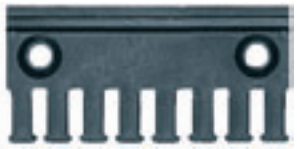
Chainfix Clip

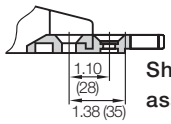
Modular snap-on strain relief device

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.**

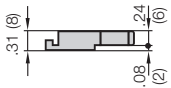
Cable ø		Part No.	Part No.
in.	(mm)	Clamp	Bottom
.16-.31	(4-8)	CFC-08-M	CFC-08-C
.31-.47	(8-12)	CFC-12-M	CFC-12-C
.47-.63	(12-16)	CFC-16-M	CFC-16-C
.63-.79	(16-20)	CFC-20-M	CFC-20-C
.79-.94	(20-24)	CFC-24-M	CFC-24-C

Tiewrap Plates





Shown assembled

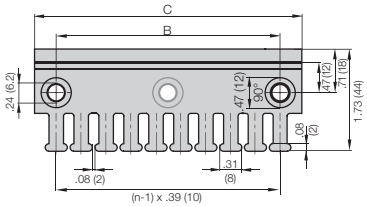


Single tiewrap plate

Option 1:
Tiewrap plates as an individual part

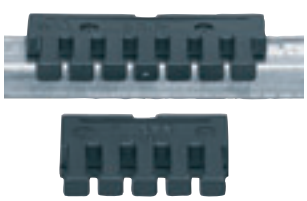
Available as an individual component, can be fixed onto a mounting bracket with the use of a profile rail.

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

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**

Standard length profile rail

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.

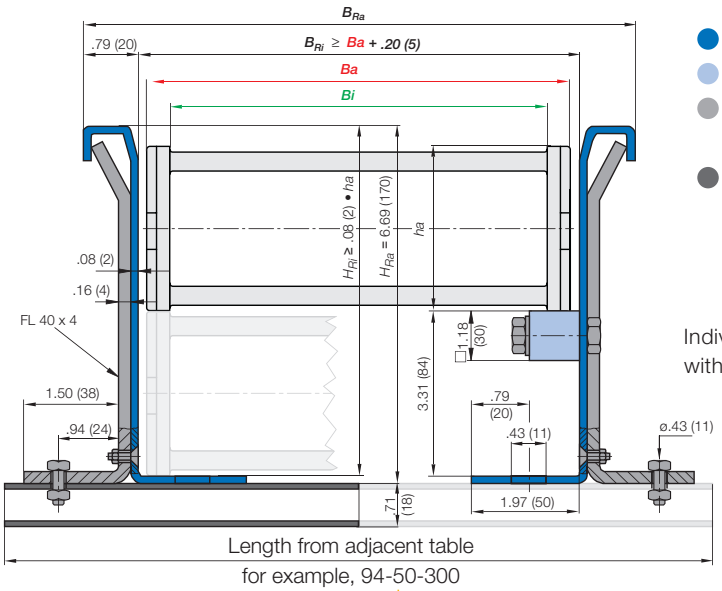
Example:
Length of travel 164 ft (50 m)
Center mounted

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