Energy Chain System® E4/4
Series 4040/4140/R8840

Features & Benefits
1. KMA mounting brackets with attachment points on all sides
2. Crossbars on Energy Chains® are removable along both radii
3. Hinged, snap-open, removable lids along outer radius of Energy Tube
4. Lateral glide surfaces for side-mounted operation
5. High side-mount stability due to undercut
6. Locking or pivoting mounting brackets available
7. Strain relief elements can be integrated with the mounting bracket
8. Closed and open styles can be combined
9. High torsional rigidity
10. Removable lids along inner radius
11. Wide, rounded plastic crossbars - cable friendly
12. Energy Chain® also available with reverse bending radii

Order Example: Complete Energy Chain®
Please indicate chain length or number of links. Example:

16.4 ft (5 m) 4040-30-300-0

With 2 separators 411 assembled every 2nd link
1 Set 404000-30-12P

Other Installation Methods
- Vertical, hanging ≤ 328 ft (100 m)
- Vertical, standing ≤ 19.69 ft (6 m)
- Side-mounted, unsupported ≤ 9.84 ft (3 m)
- Rotary requires further calculation

Usage Guidelines
- If subject to high torsional or shearing forces
- For side mounted applications involving long unsupported lengths
- For long-term operation in very moist environments

- If a quieter version is required
  ➤ Series 400/410/R880
- If a simple low-cost solution is required
  ➤ Series 14040/R18840
- When very long travels or high additional loads are involved
  ➤ Series 4040HD

Other Features / Options
- Side-mounted - unsupported
- ESD classification: Electrically conductive
- ESD/ATEX version upon request
- High torsional rigidity

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

Rol E-Chain® Series 4040R/8840R available upon request

ESD classification:
- Electrically conductive
- ESD/ATEX version upon request

Side-mounted - unsupported
- High torsional rigidity
- 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

energy chain® configurator
Energy Chain System® E4/4 Series 4040/4140/R8840
Installation Dimensions

Short travel, unsupported length
- FLG = unsupported with permitted sag
- FLB = unsupported with straight upper run

Further information ➤ Design, Chapter 1

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

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: \( \frac{S}{2} + K \)

The diagram illustrates the dimensions for unsupported energy chains. The legend provides explanations for the various symbols and terms used in the calculations.

Speed / acceleration FLG
max. 65.6 ft/s (20 m/s) / max. 656 ft/s² (200 m/s²)

Speed / acceleration FLB
max. 9.84 ft/s (3 m/s) / max. 19.69 ft/s² (6 m/s²)

Gilding 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

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

If the unsupported length is exceeded, the Energy Chain®/Tube must glide on itself. This requires a guide trough.
Design, Chapter 1
Energy Chain System® E4/4  
Series 4040/4140/R8840

**Series 4040 - 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**

```
4040-30-250-0
```

**Series 4140 - 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**

```
4140-30-250-0
```

**Series R8840 - fully enclosed Energy Tube**

- Fully enclosed
- Excellent cable and hose protection against dirt
- Protection against hot chips up to 165°F (90°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**

```
8840-30-250-0
```

**Energy Chain® as separate parts, links and side plates**

- Right side link*, single part - Part No. 4040-02
- Single crossbar, Energy Chain® - Part No. 450-
- Single lid, Energy Tube - Part No. 885-
- Single bottom, Energy Tube - Part No. 886-
- Left side link*, single part - Part No. 4040-01

*View from the fixed point of the Energy Chain®/Energy Tube
**This radius is not available for the R8840 Series**

Choose from the radii below for all of the above sizes

<table>
<thead>
<tr>
<th>Radius (mm)</th>
<th>Example: 4040-30-0</th>
</tr>
</thead>
<tbody>
<tr>
<td>R</td>
<td>5.31 (135) 5.91 (150) 6.69 (175) 7.87 (200) 9.45 (240) 9.84 (250) 11.81 (300) 13.78 (350) 15.75 (400) 19.88 (500)</td>
</tr>
<tr>
<td>H**+**</td>
<td>14.17 (60) 15.16 (385) 17.13 (433) 19.09 (486) 22.24 (665) 23.03 (686) 26.97 (666) 30.91 (785) 34.84 (885) 42.72 (1085)</td>
</tr>
<tr>
<td>D</td>
<td>10.63 (270) 11.22 (285) 12.20 (310) 13.19 (335) 14.76 (375) 15.16 (385) 17.13 (426) 19.09 (486) 21.06 (535) 25.00 (635)</td>
</tr>
<tr>
<td>K</td>
<td>25.59 (650) 29.53 (795) 32.48 (825) 35.49 (900) 40.16 (1020) 41.34 (1060) 48.23 (1225) 52.76 (1340) 57.09 (1450) 69.88 (1775)</td>
</tr>
</tbody>
</table>

**Specifications/CAD/RFS:**
- Energy Chain System® E4/4 Series 4040/4140/R8840
- Supplied part number with required radius. Example: 4040-30-0
- Pitch: 3.58 in. (91mm) per link

**Example:**
- Choose from the radii below for all of the above sizes.
Energy Chain System® E4/4
Series 4040/4140/R8840
Interior Separation

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 1.30 in. (33mm) for Energy Tubes and .63 in. (16mm) for Energy Chain®. There is no minimum spacing needed for side plates.

- **Standard separator 401** 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 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 (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).

---

**Spacers**

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Unassembled</th>
<th>Assembled</th>
</tr>
</thead>
<tbody>
<tr>
<td>405-10</td>
<td>415-10</td>
<td>.39&quot; (10)</td>
</tr>
<tr>
<td>405-15</td>
<td>415-15</td>
<td>.59&quot; (15)</td>
</tr>
<tr>
<td>405-20</td>
<td>415-20</td>
<td>.79&quot; (20)</td>
</tr>
<tr>
<td>405-30</td>
<td>415-30</td>
<td>1.18&quot; (30)</td>
</tr>
<tr>
<td>405-40</td>
<td>415-40</td>
<td>1.57&quot; (40)</td>
</tr>
</tbody>
</table>
Energy Chain System® E4/4
Series 4040/4140/R8840
Interior Separation

Option 2: Shelves
Energy Chains® and Energy Tubes can be subdivided both vertically and horizontally using the various interior separation elements.

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

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

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

- 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 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

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

Center crossbar - developed for applications involving a very large number of thin cables, individually separated. This offers the option of subdividing the Energy Chain® into upper and lower halves, with mutually independent separators.

Rolclip - 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

Roller separator - performs a similar function to the Rolclip, but doubles as a separator. Consult igus® if you have any questions regarding the roller separator.
Energy Chain System® E4/4
Series 4040/4140/R8840
Special Accessories

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® (up to 118" (3000 mm)
- 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.

Extender crossbars - For careful guiding of large diameter cables and hoses
- Intended for cables and hoses with a maximum outer diameter of 9.64 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.

Part number example for Energy Chain®
4040-10/20/10-200-0
4040-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
- 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 | By request | Round | Yes | No
450-17-RD115 | By request | Round | No | Yes
450-25-D150 | By request | Square | Yes | No
450-30-D200 | By request | Square | Yes | No
450-35-D250 | By request | Square | Yes | No
450-40-D300 | By request | Square | Yes | No
450-20-HD150 | By request | Square | No | Yes
450-25-HD200 | By request | Square | No | Yes
450-30-HD250 | By request | 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® E4/4
Series 4040/4140/R840
Mounting Brackets - KMA

Option 1: KMA pivoting
- Profile rail option
- Universal use
- Corrosion resistant
- Short and long travels
- Space-restricted conditions

Moving end
404000...1

Fixed end
404000...2

Option 2: KMA locking
- Profile rail option
- Universal use
- Corrosion resistant
- Extreme accelerations
- Vertical hanging/standing travels

Part Number Structure

Part number examples are shown for pivoting brackets. For locking brackets change part number to 414000.
### Mounting Brackets - Steel

#### Part No. Mounting Brackets Full Set
4 parts, 2 with pin, 2 with bore
Series 4040, 4140 or R8840:
40400-12

#### Part No. Mounting Bracket Moving End
2 parts, 1 left & 1 right with bore
Series 4040, 4140 or R8840
40400-1

#### Part No. Mounting Bracket Fixed End
2 parts, 1 left & 1 right with pin
Series 4040, 4140 or R8840
40400-2

### Bracket Mounting dimensions

<table>
<thead>
<tr>
<th>Width of Chain Bi (in.)</th>
<th>Part Number</th>
<th>Full Set</th>
<th>Moving End Only</th>
<th>Fixed End Only</th>
<th>Mounting Dimension A (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.97 (50)*</td>
<td>40400-12</td>
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<td>-2</td>
<td>-2</td>
<td>3.78 (96)</td>
</tr>
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<td>2.56 (65)</td>
<td>40400-12</td>
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<td>-2</td>
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<td>2.95 (75)</td>
<td>40400-12</td>
<td>-1</td>
<td>-2</td>
<td>-2</td>
<td>1.77 (45)</td>
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<td>3.43 (87)</td>
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<td>-2</td>
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<td>3.94 (100)</td>
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<td>4.41 (112)</td>
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<td>-2</td>
<td>3.93 (100)</td>
</tr>
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<td>-2</td>
<td>-2</td>
<td>5.39 (137)</td>
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<td>6.38 (162)</td>
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<td>-2</td>
<td>-2</td>
<td>5.90 (150)</td>
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<td>6.89 (175)</td>
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<td>-2</td>
<td>-2</td>
<td>6.37 (162)</td>
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<td>7.36 (187)</td>
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<td>-2</td>
<td>-2</td>
<td>6.88 (175)</td>
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<tr>
<td>7.87 (200)</td>
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<td>-2</td>
<td>-2</td>
<td>7.36 (187)</td>
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<td>8.35 (212)</td>
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<td>-2</td>
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<td>9.33 (237)</td>
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<td>-2</td>
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<td>-2</td>
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<td>40400-12</td>
<td>-1</td>
<td>-2</td>
<td>-2</td>
<td>11.81 (300)</td>
</tr>
</tbody>
</table>

*Mounting bracket feet must face outward.

### Energy Chain System® E4/4
Series 4040/4140/R8840

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

### Possible installation configurations -

#### Option 1: pivoting
- Electrically conductive

#### Moving end
- Mounting bracket feet must face outward
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.

<table>
<thead>
<tr>
<th>Part No. Single Clamp</th>
<th>Part No. Double Clamp</th>
<th>Part No. Triple Clamp</th>
<th>Cable ø</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steel</td>
<td>Stainless</td>
<td>Steel</td>
<td>Stainless</td>
</tr>
<tr>
<td>CFX12-1</td>
<td>CFX12-1E</td>
<td>CFX12-2</td>
<td>CFX12-2E</td>
</tr>
<tr>
<td>CFX14-1</td>
<td>CFX14-1E</td>
<td>CFX14-2</td>
<td>CFX14-2E</td>
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<tr>
<td>CFX16-1</td>
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<tr>
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<td>CFX38-1</td>
<td>CFX38-1E</td>
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</tr>
<tr>
<td>CFX42-1</td>
<td>CFX42-1E</td>
<td>–</td>
<td>–</td>
</tr>
</tbody>
</table>

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

Chainfix Clip

Modular snap-on strain relief device
Chainfix clip is available for cable diameters ranging from .16” (4mm) to .94” (24 mm). It is suitable 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.

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.

<table>
<thead>
<tr>
<th>Tiewrap Plate</th>
<th>n Number of Teeth</th>
<th>C Overall Width in. (mm)</th>
<th>B Bore Width in. (mm)</th>
<th>Center Bore</th>
</tr>
</thead>
<tbody>
<tr>
<td>3050-ZB</td>
<td>5</td>
<td>1.97 (50)</td>
<td>1.18 (30)</td>
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<td>3075-ZB</td>
<td>7</td>
<td>2.95 (75)</td>
<td>2.16 (55)</td>
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<td>3100-ZB</td>
<td>10</td>
<td>3.94 (100)</td>
<td>3.15 (80)</td>
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<tr>
<td>3115-ZB</td>
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<td>4.53 (115)</td>
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<td>3125-ZB</td>
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<td>4.92 (125)</td>
<td>4.13 (105)</td>
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<tr>
<td>3150-ZB</td>
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<td>5.91 (150)</td>
<td>5.12 (130)</td>
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<td>3175-ZB</td>
<td>17</td>
<td>6.89 (175)</td>
<td>6.10 (155)</td>
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<td>3200-ZB</td>
<td>20</td>
<td>7.87 (200)</td>
<td>7.09 (180)</td>
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<tr>
<td>3225-ZB</td>
<td>22</td>
<td>8.86 (225)</td>
<td>8.07 (205)</td>
<td>yes</td>
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<tr>
<td>3250-ZB</td>
<td>25</td>
<td>9.84 (250)</td>
<td>9.06 (230)</td>
<td>yes</td>
</tr>
</tbody>
</table>

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 |
|-------|-----------------|-----------------|
| 3050-ZC | 5               | 1.97 (50)       |
| 3075-ZC | 7               | 2.95 (75)       |

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

Option 3:
Clip-on Tiewrap plates for opening crossbars
Clip-on tiewrap plates are also available as an attachment to opening crossbars. They can be positioned at any point along the Energy Chain®.

| Part No. Number of Teeth Width of Strain Relief |
|-------|-----------------|-----------------|
| 4550-ZS | 5               | 1.89 (48)       |
| 4575-ZS | 7               | 2.91 (74)       |

For more information please refer to strain relief section of Chapter 10
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 (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 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 m) long profile rail

Guides troughs available upon request

Individual attachment without profile rail

For further technical information on guide troughs ➤ Chapter 9
The maintenance-free Series 4040 protects the igus® Chainflex® motor and signal cables during the lifting and lowering movements of the tidal turbine and also protects them against aggressive ambient conditions. The travel distance amounts to approx. 65.6 ft. (20 m) in vertical direction above and underwater.

Rol instead of gliding: Rol E-Chain®

Special solution for long travels. 75% less drive power (gliding application) with igus® Rol E-Chain®.

Series 4040R - Order example 4040RHD-30-250-0

Further information: Call igus® at 800-521-2747
### Crossbars every link
for particularly demanding applications

<table>
<thead>
<tr>
<th>Series</th>
<th>Inner height $h_i$ (in. / (mm))</th>
<th>Inner width $B_i$ (in. / (mm))</th>
<th>Outer width $B_a$ (in. / (mm))</th>
<th>Outer height $h_a$ (in. / (mm))</th>
<th>Bending radius $R$ (in. / (mm))</th>
</tr>
</thead>
<tbody>
<tr>
<td>2828</td>
<td>1.25 (32)</td>
<td>1.97-15.75 (50-400)</td>
<td>2.91-16.69 (74-424)</td>
<td>2.13 (54)</td>
<td>2.48-11.81 (63-300)</td>
</tr>
<tr>
<td>3838</td>
<td>1.65 (42)</td>
<td>1.97-15.75 (50-400)</td>
<td>3.03-16.81 (77-427)</td>
<td>2.52 (64)</td>
<td>2.95-13.78 (75-350)</td>
</tr>
<tr>
<td>4040</td>
<td>2.20 (56)</td>
<td>1.97-23.62 (50-600)</td>
<td>3.39-25.04 (86-636)</td>
<td>3.31 (84)</td>
<td>5.31-19.69 (135-500)</td>
</tr>
<tr>
<td>5050</td>
<td>3.15 (80)</td>
<td>1.97-23.62 (50-600)</td>
<td>3.94-25.59 (100-650)</td>
<td>4.25 (108)</td>
<td>5.91-39.37 (150-1000)</td>
</tr>
</tbody>
</table>

### Crossbars every 2nd link
for almost all applications

<table>
<thead>
<tr>
<th>Series</th>
<th>Inner height $h_i$ (in. / (mm))</th>
<th>Inner width $B_i$ (in. / (mm))</th>
<th>Outer width $B_a$ (in. / (mm))</th>
<th>Outer height $h_a$ (in. / (mm))</th>
<th>Bending radius $R$ (in. / (mm))</th>
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<td>1.25 (32)</td>
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<td>2.52 (64)</td>
<td>2.95-13.78 (75-350)</td>
</tr>
<tr>
<td>4140</td>
<td>2.20 (56)</td>
<td>1.97-23.62 (50-600)</td>
<td>3.39-25.04 (86-636)</td>
<td>3.31 (84)</td>
<td>5.31-19.69 (135-500)</td>
</tr>
<tr>
<td>5050</td>
<td>3.15 (80)</td>
<td>1.97-23.62 (50-600)</td>
<td>3.94-25.59 (100-650)</td>
<td>4.25 (108)</td>
<td>5.91-39.37 (150-1000)</td>
</tr>
</tbody>
</table>

### Energy Tubes
fully enclosed, excellent cable protection for hot chips up to 1,562°F

<table>
<thead>
<tr>
<th>Series</th>
<th>Inner height $h_i$ (in. / (mm))</th>
<th>Inner width $B_i$ (in. / (mm))</th>
<th>Outer width $B_a$ (in. / (mm))</th>
<th>Outer height $h_a$ (in. / (mm))</th>
<th>Bending radius $R$ (in. / (mm))</th>
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</thead>
<tbody>
<tr>
<td>R7728</td>
<td>1.25 (32)</td>
<td>1.97-11.81 (50-300)</td>
<td>2.91-12.76 (74-324)</td>
<td>2.13 (54)</td>
<td>4.92-11.81 (125-300)</td>
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<tr>
<td>R7838</td>
<td>1.65 (42)</td>
<td>1.97-11.81 (50-300)</td>
<td>3.03-12.87 (77-327)</td>
<td>2.52 (64)</td>
<td>4.92-13.78 (125-350)</td>
</tr>
<tr>
<td>R8840</td>
<td>2.20 (56)</td>
<td>2.95-18.19 (75-462)</td>
<td>4.37-19.65 (111-499)</td>
<td>3.31 (84)</td>
<td>5.91-19.69 (150-500)</td>
</tr>
<tr>
<td>R9850</td>
<td>3.15 (80)</td>
<td>2.95-18.19 (75-462)</td>
<td>4.92-20.20 (125-513)</td>
<td>4.25 (108)</td>
<td>7.87-39.37 (200-1000)</td>
</tr>
</tbody>
</table>
**Energy Chain System® E4/4**

**Assembly Instructions**

### Energy Chains® and Energy Tubes - Assembling

1. **Remove crossbars at connection point. Slide side links into each other - Press together**

2. **Join the side links - join the second side link by pressing from the top**

3. **Join the side links together on the opposite side by applying pressure to the outer link**

4. **Assemble crossbars - Push down and snap in by using a screwdriver**

### Assembling continued

5. **Assemble clips (Energy Chains® with crossbars every other link) - Push down and snap in**

6. **Assemble Energy Tube lids/bottoms - Attach to the connector at an angle - Snap in**

### Energy Chains® and Energy Tubes - Separating

1. **Remove crossbars, clips, and lids on two adjacent chain links. Guide the screwdriver into the slot between side links and release it by levering it and separate the Energy Chain®**

### 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**