

TRE- "Easy" Design -  
simply press cables in

High tensile strength thanks to  
special ball-and-socket principle

Able to move multi-dimensionally -  
Twist up to approx.  $\pm 10^\circ$  per link  
possible in longitudinal axis

Easy opening mechanism for easy filling  
with cable and hose packages

Excellent mechanical properties

Easy assembly and dismantling -  
one die-cast component

High stability - thanks  
to exterior stop dogs

Small bending radii and short pitch

igumid NB:  $-40^\circ$  up to  $+80^\circ$  C  
VDE 0304 IIC UL94 V2

Easy attachment and intelligent  
accessories onto the robot/machine

## + Robotic applications, easy filling

### When to use Series TRE:

- If an easy to fill energy supply is required for multi-dimensional (3D) movements
- If high torsional stability is required
- If the system has to be shortened or lengthened easily
- If small bending radii are required
- If high tensile strength is important
- If an easy opening mechanism for easy filling with cable and hose packages is needed



### When to use a different igus® Series:

- For circular movements with high loads
- ▶ **System twisterchain®new, from page 2.56**
- If a fully enclosed solution is required
- ▶ **triflex® R - TRC, page 2.12**
- If a more simple and low-cost 3D-solution is required
- ▶ **triflex® R - TRL, page 2.16**



triflex® R-Set - compact module for  
all movements on robots available



**Available from stock. Delivery in 24h or today!\***

\*Delivery time means time until shipping of goods



3D-CAD files, configurators, PDF ▶ [www.triflex-r.eu](http://www.triflex-r.eu)

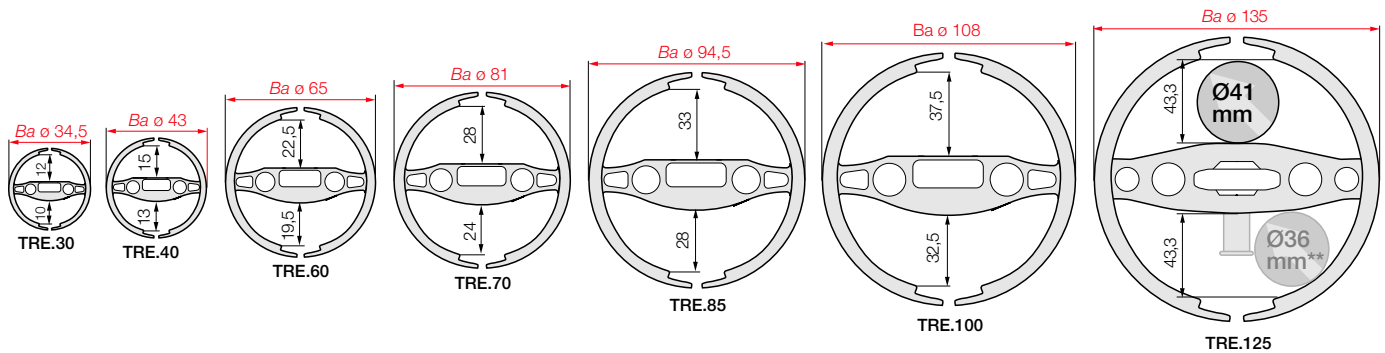
triflex® R | Series TRE | "Easy"-Design - simply press cables in

Standard	Series TRE Standard	Series TRE B-Version	Series TRE C-Version	Bi 1 [mm]	Bi 2 [mm]	Ba [mm]	R [mm]	d1** [mm]	d2** [mm]	Pitch [mm]	Links/m	Weight [kg/m]
	TRE.30. 050.0	-	-	12	10	34,5	050	10	8	11,3	89	≈ 0,26
	TRE.40. 058.0	TRE.40. 058.0.B	-	15	13	43	058	13	11	13,9	72	≈ 0,36
	TRE.60. 087.0	TRE.60. 087.0.B	-	22,5	19,5	65	087	20,5	17,5	20,4	49	≈ 0,83
	TRE.70. 110.0	TRE.70. 110.0.B	-	28	24	81	110	26	22	25,6	39	≈ 1,30
	TRE.85. 135.0	TRE.85. 135.0.B	-	33	28	94,5	135	31	26	30,6	33	≈ 1,67
	TRE.100.145.0	TRE.100.145.0.B	TRE.100.145.0.C	37,5	32,5	108	145	35,5	30,5	34,5	29	≈ 2,35
	TRE.125.182.0	-	X 1)	43,3	43,3	135	182	41	41 2)	44,6	23	≈ 4.40

1) TRE.125: C-version is standard!

2) Max. cable diameter Ø 41 mm. Max. cable diameter changes to Ø 36 mm only, if shortening/lengthening of a filled triflex® R is required

\*\*For quick and easy insertion / removal of cables using the easy chain® principle, we recommend a maximum cable diameter of 70% of the specified value



## Optional | B-version - 4 x higher torsion forces

**NEW** in this catalog



The advanced ball and socket connection now uses an additional arrester for even higher stability. Especially designed for heavy duty applications with high accelerations and top speeds. ● Up to 4 times stronger with improved bending radius strength ● Able to handle even higher torsion forces ● Made of only one single part per e-chain® link ► [www.igus.eu/3Dstabil](http://www.igus.eu/3Dstabil)

## Optional | C-version - quick assembly, 50% higher forces

**NEW** in this catalog



Now available with proven bolt connection for even faster assembly and disassembly ● Linear pull force capacity increased up to 4.000 N ● Up to 4 times stronger and improved bending radius strength ● C-version drastically reduces installation time ● Stronger lock for torsion limitation ● igubal® Spherical Bearing for non-slip traction ► [www.igus.eu/3Dstabil](http://www.igus.eu/3Dstabil)

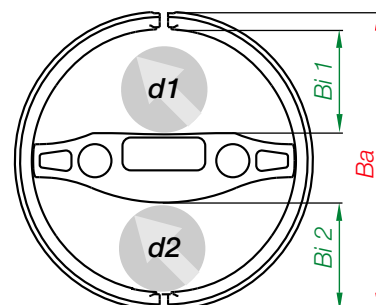
### Order key



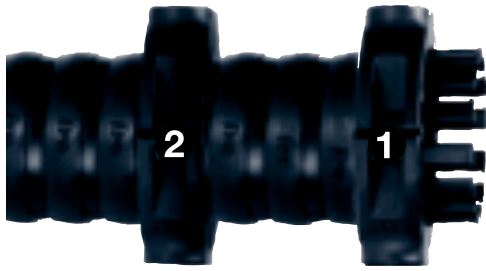
TRE. 100. 145. 0. B/C



- Optional B-/C-version
- Standard color black
- Bending radius R
- Width index Ø
- Series / "Easy"-design



TRE - "Easy"-design, with Bi 40 mm inner width and R 058 mm radius, color black = Part No. TRE.40.058.0



**Option: Standard mounting brackets**

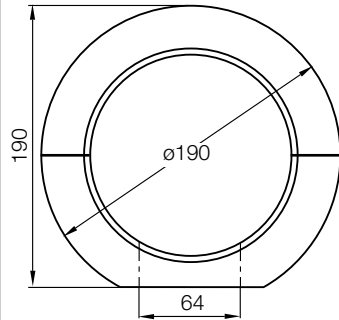
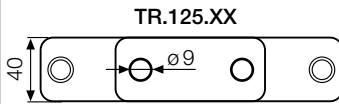
- Quick and easy fixing
- Short downtimes when swapping a harnessed triflex® R system
- Mounting bracket ① with strain relief available
- Mounting bracket also as ② intermediate link
- Quick assembly by means of spring locks
- Bracket holes for common robot types
- End and intermediate fixing possible

**Dimensions and order configurations**

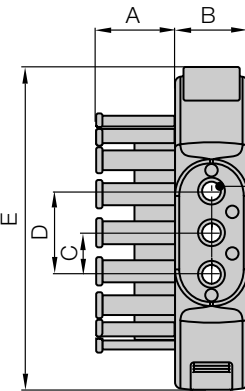
Part No. structure

TR.60. 01. M6

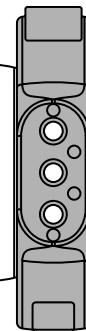
- Option with insert nuts
- With strain relief
- Mounting bracket



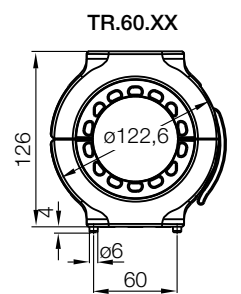
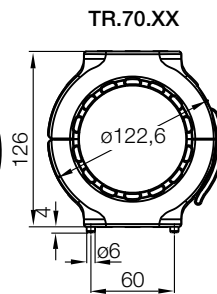
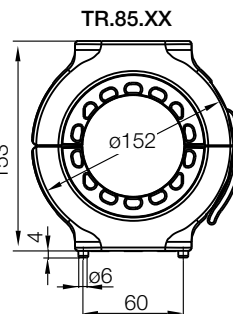
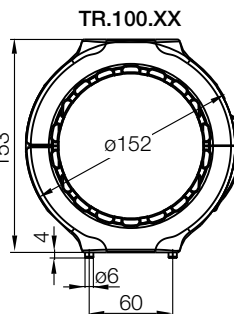
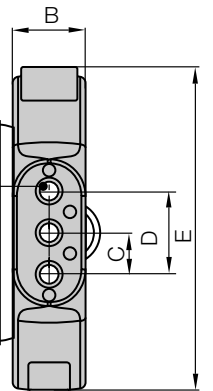
Mounting bracket with strain relief TR.XX.01



Mounting bracket as intermediate link TR.XX.02



Mounting bracket without strain relief TR.XX.02



For Series	Mounting bracket with strain relief	Mounting bracket as intermediate link	Dim. A [mm]	Dim. B [mm]	Dim. C [mm]	Dim. D [mm]	Dim. E [mm]	Dim. ø F [mm]
TRC/TRE/TRL.30.	▶							
TRC/TRE/TRL.40.	▶ TR.40.01.M6	TR.40.02.M6	17,8	21	13,5	27	85	6,5
TRC/TRE/TRL.60.	▶ TR.60.01.M8	TR.60.02.M8	25	35	20	40	126	9
TRC/TRE/TRL.70.	▶ TR.70.01.M8	TR.70.02.M8	25	35	20	40	126	9
TRC/TRE.85.	▶ TR.85.01.M8	TR.85.02.M8	40	35	20	40	153	9
TRC/TRE/TRL.100.	▶ TR.100.01.M8	TR.100.02.M8	38	35	20	40	153	9
TRC/TRE.125.	▶ -	TR.125.02.M8						

TRC/TRE.125 Dimensions and delivery time upon request!

Strain relief is possible on the moving end and/or the fixed end.

Standard: Trough holes in ØF - Option: with insert nuts, steel, M6/M8

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51147 Cologne

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E-mail: info@igus.de



**Option: Light mounting brackets**

- Standard for TRL version, also compatible with all triflex® R variants (TRC/TRE)
- Mounting bracket ① with strain relief available
- Mounting bracket also as ② intermediate link available
- Economical and light
- For simple 3D-movements and loads
- Comprising two halves - easy to assemble

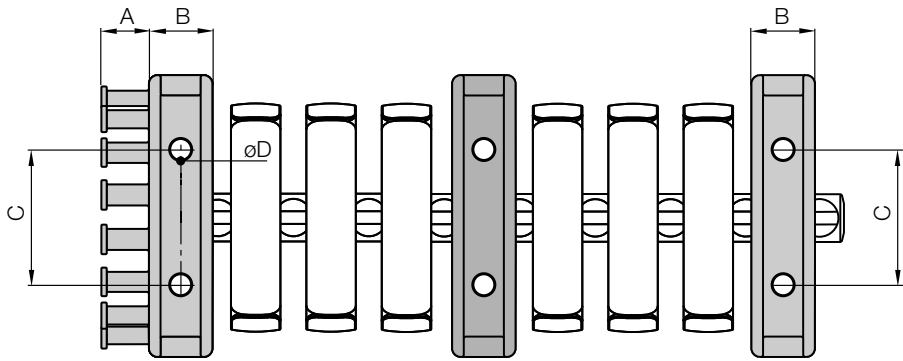


Mounting bracket with strain relief TL.XX.01.Z2

Mounting bracket as intermediate link TL.XX.01.Z0

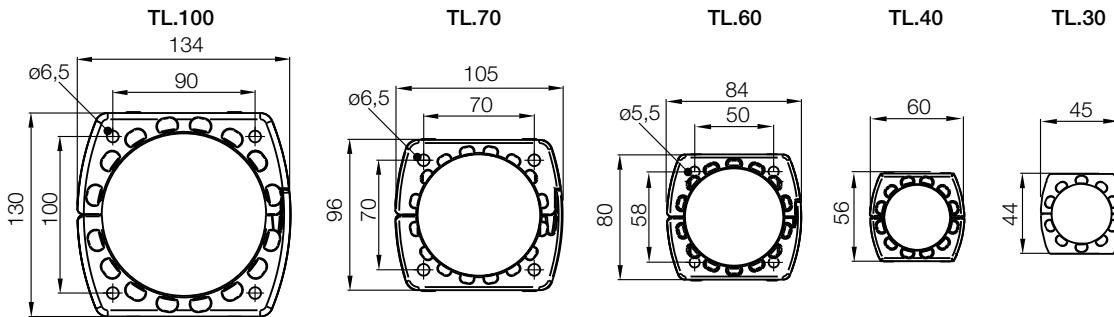
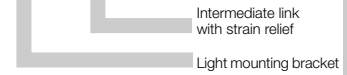
Mounting bracket without strain relief TL.XX.01.Z0

**Dimensions and order configurations**



Part No. structure

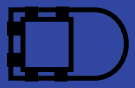
TL.40.01. Z2



For Series	Part No.	Dim. A [mm]	Dim. B [mm]	Dim. C [mm]	Dim. ø D [mm]	For fixed end (socket)	For moving end (ball)	As intermediate link
TRC/TRE/TRL.30	▶ TL.30.01.Z0	○	13	24	4,5	TRC/TRE/TRL	TRC/TRE/TRL	TRC/TRE/TRL
	▶ TL.30.01.Z1	12,5	13	24	4,5	TRC/TRE/TRL	TRC/TRE/TRL	-
	▶ TL.30.01.Z2	20	13	24	4,5	TRC/TRE/TRL	TRC/TRE/TRL	-
TRC/TRE/TRL.40	▶ TL.40.01.Z0	○	14	36	5,8	TRC/TRE/TRL	TRC/TRE/TRL	TRC/TRE/TRL
	▶ TL.40.01.Z1	12,5	14	36	5,8	TRC/TRE/TRL	TRL	-
	▶ TL.40.01.Z2	20	14	36	5,8	TRC/TRE/TRL	TRC/TRE/TRL	-
TRC/TRE/TRL.60	▶ TL.60.01.Z0	○	20	48	5,8	TRC/TRE/TRL	TRC/TRE/TRL	TRC/TRE/TRL
	▶ TL.60.01.Z1	17	20	48	5,8	TRC/TRE/TRL	TRL	-
	▶ TL.60.01.Z2	27	20	48	5,8	TRC/TRE/TRL	TRC/TRE/TRL	-
TRC/TRE/TRL.70	▶ TL.70.01.Z0	○	27	64	6,5	TRC/TRE/TRL	TRC/TRE/TRL	TRC/TRE/TRL
	▶ TL.70.01.Z1	17,5	27	64	6,5	TRC/TRE/TRL	TRL	-
	▶ TL.70.01.Z2	27,5	27	64	6,5	TRC/TRE/TRL	TRC/TRE/TRL	-
TRC/TRE/TRL.100	▶ TL.100.01.Z0	○	30	64	6,5	TRC/TRE/TRL	TRC/TRE/TRL	TRC/TRE/TRL
	▶ TL.100.01.Z1	22,5	30	64	6,5	TRC/TRE/TRL	TRL	-
	▶ TL.100.01.Z2	42,5	30	64	6,5	TRC/TRE/TRL	TRC/TRE/TRL	-

○ = without strain relief    - = not possible

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**Option: Swivel bearing - smooth motion**

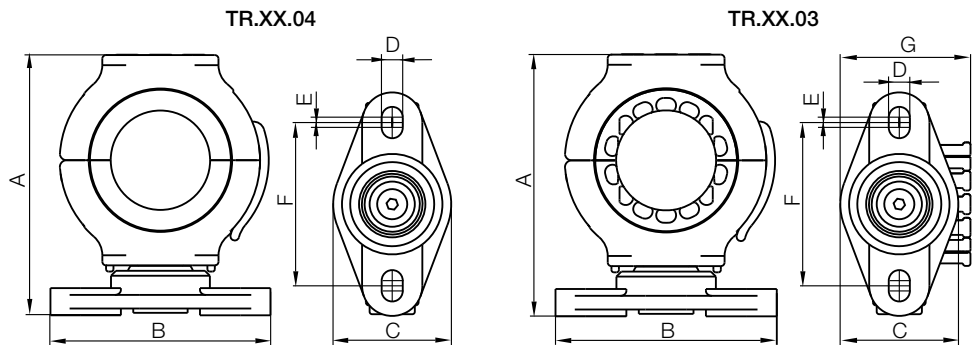
- To smoothen the motion of the cables requiring guidance, it is necessary to allow for extreme twisting and bending. This relieves cables with highly sensitive bending radii (such as fiber optic cables) when following a robot's movements. Swivel bearings are used to achieve this
- Available in 2 designs (with or without strain relief)
- Pivoted bearing with a maintenance-free igubal® ball-and-socket joint
- Minimization of critical bending cycles
- Gentler motion

**Dimensions and order configurations**

Part No. structure

TR.60. 03. / 04.

- Intermediate link
- With strain relief
- Mounting bracket



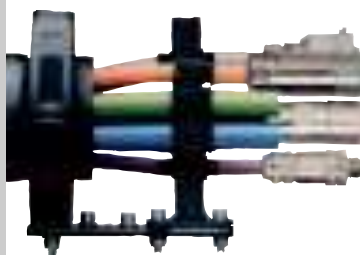
For Series	Standard	Swivel bearing with tiewrap plate	Swivel bearing as intermediate links	Dim. A [mm]	Dim. B [mm]	Dim. C [mm]	Dim. D [mm]	Dim. E [mm]	Dim. F [mm]	Dim. G* [mm]
TRC/TRE/TRL.40.	▶	TR.40.03	TR.40.04	105	89	47	8,4	4,1	65	51,8
TRC/TRE/TRL.60.	▶	TR.60.03	TR.60.04	152	118	65	10,5	5,5	87,5	73,5
TRC/TRE/TRL.70.	▶	TR.70.03	TR.70.04	152	118	65	10,5	5,5	87,5	73,5
TRC/TRE.85.	▶	TR.85.03	TR.85.04	179	118	65	10,5	5,5	87,5	88
TRC/TRE/TRL.100.	▶	TR.100.03	TR.100.04	179	118	65	10,5	5,5	87,5	88

\*Only TR.XX.03

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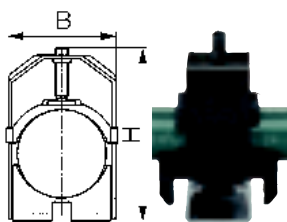
igus® GmbH  
51147 Cologne

**Strain relief systems (only for TRC/TRE) - Secure mounting of large cross sections with igus® standard chainfix clamps**



- Available in 3 options per size
- Multiaxially adjustable, for ideal positioning
- Suits all additional axes: Ø 30 mm, Ø 32 mm, Ø 34 mm

**Product range clamps**



Part No. Steel	Part No. Stain-less Steel*	ø [mm]	B [mm]	H [mm]
CFX12.1	CFX12.1.E	6 - 12	16	58
CFX14.1	CFX14.1.E	12 - 14	18	50
CFX16.1	CFX16.1.E	14 - 16	20	52
CFX18.1	CFX18.1.E	16 - 18	22	54
CFX20.1	CFX20.1.E	18 - 20	24	56
CFX22.1	CFX22.1.E	20 - 22	26	58

Part No. Steel	Part No. Stain-less Steel*	ø [mm]	B [mm]	H [mm]
CFX26.1	CFX26.1.E	22 - 26	30	67
CFX30.1	CFX30.1.E	26 - 30	34	71
CFX34.1	CFX34.1.E	30 - 34	38	75
CFX38.1	CFX38.1.E	34 - 38	42	79
CFX42.1	CFX42.1.E	38 - 42	46	83

\*Material stainless steel: 1.4301

Internet: [www.igus.eu](http://www.igus.eu)  
E-mail: [info@igus.de](mailto:info@igus.de)



**triflex® R Quick exchange kit**  
**TR.60/70/85/100.22.XX**

- Ideal for triflex® R readychain®
- One-time-only alignment
- No repeat alignment upon exchange of readychain®
- Exchange of th triflex® R unit incl. cables without any tools

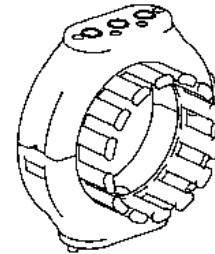


For e-chain®	Part No. Quick exchange kit
TRC/TRE.60 ▶	TR.60.22. <span style="border: 1px solid black; padding: 0 2px;">30</span> / <span style="border: 1px solid black; padding: 0 2px;">32</span> / <span style="border: 1px solid black; padding: 0 2px;">34</span>
TRC/TRE.70 ▶	TR.70.22. <span style="border: 1px solid black; padding: 0 2px;">30</span> / <span style="border: 1px solid black; padding: 0 2px;">32</span> / <span style="border: 1px solid black; padding: 0 2px;">34</span>
TRC/TRE.85 ▶	TR.85.22. <span style="border: 1px solid black; padding: 0 2px;">30</span> / <span style="border: 1px solid black; padding: 0 2px;">32</span> / <span style="border: 1px solid black; padding: 0 2px;">34</span>
TRC/TRE.100 ▶	TR.100.22. <span style="border: 1px solid black; padding: 0 2px;">30</span> / <span style="border: 1px solid black; padding: 0 2px;">32</span> / <span style="border: 1px solid black; padding: 0 2px;">34</span>

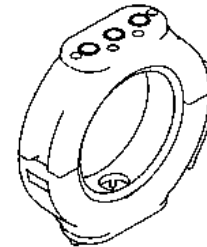
For required additional axles Ø 30, 32, 34 mm, please add appropriate Index e.g. TR.100.22 .30

**triflex® R pivot bracket**  
**TR.60/70/85/100.21.XX**

- Available in 2 options per size (with/without strain relief)
- Safe and simple securing of the cables with cable ties
- Possible also without strain relief (Strain relief in the application)



Pivot bracket with strain relief TR.XX21.01



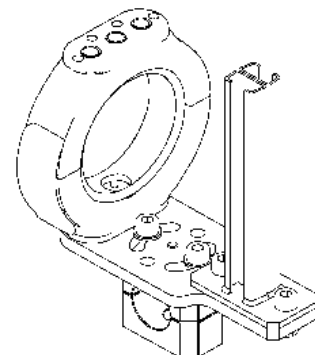
Pivot bracket with strain relief TR.XX21.02

For e-chain®	Part No. Pivot bracket with strain relief	Part No. Pivot bracket without strain relief
TRC/TRE.60 ▶	TR.60.21.01. <span style="border: 1px solid black; padding: 0 2px;">30</span> / <span style="border: 1px solid black; padding: 0 2px;">32</span> / <span style="border: 1px solid black; padding: 0 2px;">34</span>	TR.60.21.02. <span style="border: 1px solid black; padding: 0 2px;">30</span> / <span style="border: 1px solid black; padding: 0 2px;">32</span> / <span style="border: 1px solid black; padding: 0 2px;">34</span>
TRC/TRE.70 ▶	TR.70.21.01. <span style="border: 1px solid black; padding: 0 2px;">30</span> / <span style="border: 1px solid black; padding: 0 2px;">32</span> / <span style="border: 1px solid black; padding: 0 2px;">34</span>	TR.70.21.02. <span style="border: 1px solid black; padding: 0 2px;">30</span> / <span style="border: 1px solid black; padding: 0 2px;">32</span> / <span style="border: 1px solid black; padding: 0 2px;">34</span>
TRC/TRE.85 ▶	TR.85.21.01. <span style="border: 1px solid black; padding: 0 2px;">30</span> / <span style="border: 1px solid black; padding: 0 2px;">32</span> / <span style="border: 1px solid black; padding: 0 2px;">34</span>	TR.85.21.02. <span style="border: 1px solid black; padding: 0 2px;">30</span> / <span style="border: 1px solid black; padding: 0 2px;">32</span> / <span style="border: 1px solid black; padding: 0 2px;">34</span>
TRC/TRE.100 ▶	TR.100.21.01. <span style="border: 1px solid black; padding: 0 2px;">30</span> / <span style="border: 1px solid black; padding: 0 2px;">32</span> / <span style="border: 1px solid black; padding: 0 2px;">34</span>	TR.100.21.02. <span style="border: 1px solid black; padding: 0 2px;">30</span> / <span style="border: 1px solid black; padding: 0 2px;">32</span> / <span style="border: 1px solid black; padding: 0 2px;">34</span>

For required additional axles Ø 30, 32, 34 mm, please add appropriate Index e.g. TR.100.21.01 .30

**triflex® R connection**  
**TR.60/70/85/100/125.20.XX**

- In the use of cables with large cross section, e.g. welding applications or in heavy hydraulic hoses
- Double C rails for igus® CFX clips
- Rugged strain relief in "heavy-duty" applications
- igus® chainfix clamps made of stainless steel or steel can be used (see Table on the left)

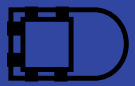


For e-chain®	Part No. connection
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TRC/TRE.70 ▶	TR.70.20. <span style="border: 1px solid black; padding: 0 2px;">30</span> / <span style="border: 1px solid black; padding: 0 2px;">32</span> / <span style="border: 1px solid black; padding: 0 2px;">34</span>
TRC/TRE.85 ▶	TR.85.20. <span style="border: 1px solid black; padding: 0 2px;">30</span> / <span style="border: 1px solid black; padding: 0 2px;">32</span> / <span style="border: 1px solid black; padding: 0 2px;">34</span>
TRC/TRE.100 ▶	TR.100.20. <span style="border: 1px solid black; padding: 0 2px;">30</span> / <span style="border: 1px solid black; padding: 0 2px;">32</span> / <span style="border: 1px solid black; padding: 0 2px;">34</span>
TRC/TRE.125 ▶	TR.125.20. <span style="border: 1px solid black; padding: 0 2px;">30</span> / <span style="border: 1px solid black; padding: 0 2px;">32</span> / <span style="border: 1px solid black; padding: 0 2px;">34</span>

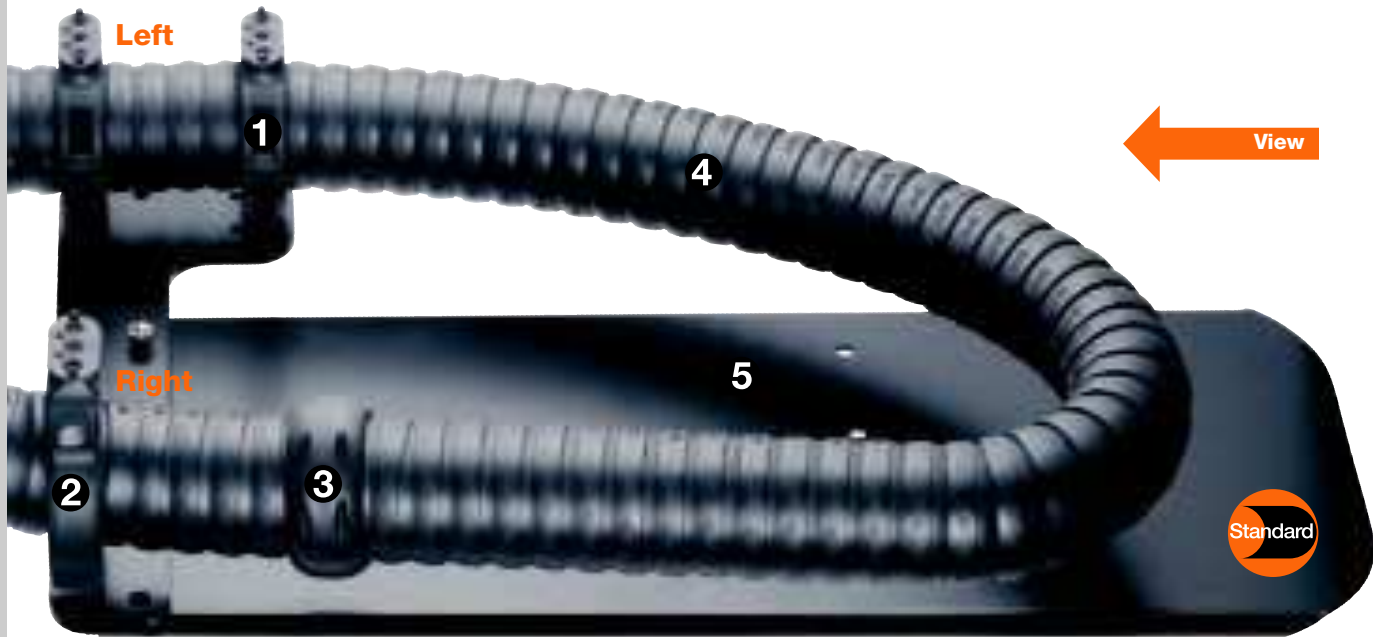
For required additional axles Ø 30, 32, 34 mm, please add appropriate Index e.g. TR.100.20 .30

triflex® R

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▶ page 2.9-11



triflex® RS - Extremely flat design, guides close to the robotic arm



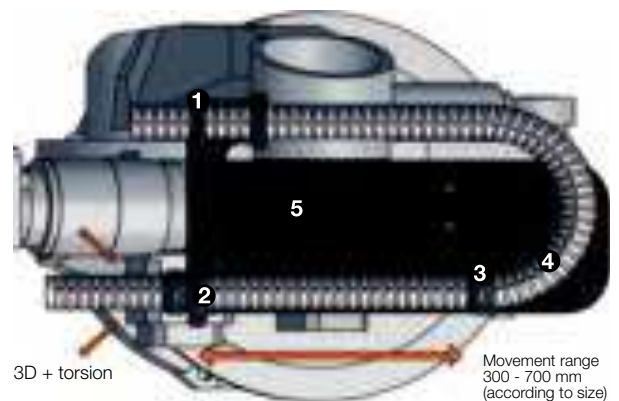
Integrated recuperating spring prevents loop formations

### Universal module for any robotic motion

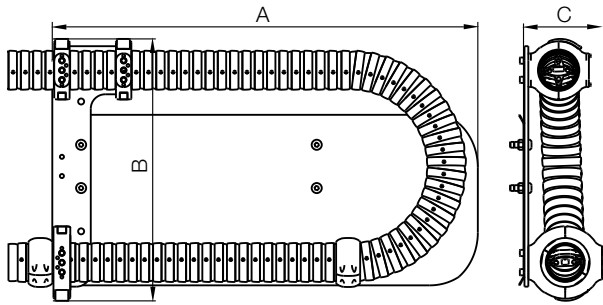
triflex®RS is a very compact universal module that can be attached to the fastening points on the robot. Applications in very limited space can be realized, thanks to the small installation height and to the fact that triflex®RS can be installed parallel to the robotic arm. triflex®RS with integrated spring mechanism allows efficient energy supply to the robotic head, without stress on the cables. The triflex® R kit offers all advantages of proven triflex® accessories, such as the FlexBar, universal assembly kit and fiber rod module in one system. All triflex®R features are also included in the universal triflex® RS module.

- **Standard-package** for all applications for immediate installation
- **Integrated spring mechanism**
- **The first choice for robotic applications with limited space**
- **Saves space - small installation height and closely routed on the robotic arm**
- **Outstanding service life**
- **Universal installation**

- ① Mounting brackets for safe fastening
- ② Glide lead-through for a close and parallel guidance on the robotic arm
- ③ Limit stop dog for a defined free movement
- ④ Integrated recuperating spring prevents loop formations
- ⑤ Single module, space-saving and quickly mounted on robot



triflex® RS - Installation Dimensions



triflex® RS - Fastening point, right

Universal module	Part No.	A	B	C
TRS for Series		[mm]	[mm]	[mm]
TRC.40/TRE.40	▶ TRC/TRE.RS.40.R	620	301	95
TRC.60/TRE.60	▶ TRC/TRE.RS.60.R	885	528	150
TRC.70/TRE.70	▶ TRC/TRE.RS.70.R	885	545	167
TRC.85/TRE.85	▶ TRC/TRE.RS.85.R	885	565	167
TRC.100/TRE.100	▶ -	-	-	-

triflex® RS - Fastening point, right, with cover

Universal module	Part No.	A	B	C
TRS for Series		[mm]	[mm]	[mm]
TRC.40/TRE.40	▶ TRC/TRE.RS.40.RC	620	301	95
TRC.60/TRE.60	▶ TRC/TRE.RS.60.RC	885	528	150
TRC.70/TRE.70	▶ TRC/TRE.RS.70.RC	885	545	167
TRC.85/TRE.85	▶ TRC/TRE.RS.85.RC	885	565	167
TRC.100/TRE.100	▶ TRC/TRE.RS.100.RC	912,5	614	167

triflex® RS - Fastening point, left

Universal module	Part No.	A	B	C
TRS for Series		[mm]	[mm]	[mm]
TRC.40/TRE.40	▶ TRC/TRE.RS.40.L	620	301	95
TRC.60/TRE.60	▶ TRC/TRE.RS.60.L	885	528	150
TRC.70/TRE.70	▶ TRC/TRE.RS.70.L	885	545	167
TRC.85/TRE.85	▶ TRC/TRE.RS.85.L	885	565	167
TRC.100/TRE.100	▶ TRC/TRE.RS.100.L	912,5	614	167

triflex® RS - Fastening point, left, with cover

Universal module	Part No.	A	B	C
TRS for Series		[mm]	[mm]	[mm]
TRC.40/TRE.40	▶ TRC/TRE.RS.40.LC	620	301	95
TRC.60/TRE.60	▶ TRC/TRE.RS.60.LC	885	528	150
TRC.70/TRE.70	▶ TRC/TRE.RS.70.LC	885	545	167
TRC.85/TRE.85	▶ TRC/TRE.RS.85.LC	885	565	167
TRC.100/TRE.100	▶ -	-	-	-

Fastening point, right



triflex® R-Set with cover for the additional support of switch cabinets or valve terminals

triflex® R - More accessories available now ...



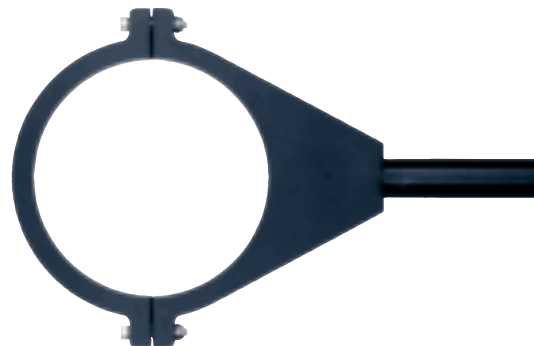
triflex® R-Set with cover (barrier)

- Creates more mounting space on robots - e.g. for switch cabinets or valve terminals
- For upside down applications
- Enables the use of triflex® RS in applications with extreme movements



43 Adapter brackets for robots from stock

- 43 adapter bracket types from stock for many different robots
- For all triflex® RS modules
- For assembly to the side or on top
- Free download of 3D CAD files for many brackets ▶ [www.igus.eu/triflexbrackets](http://www.igus.eu/triflexbrackets)

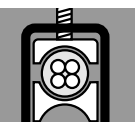


triflex® R fixation to axis 6  
Part No. TR.907.667.Inner Ø

- One axis diameter (Ø30 mm) for all robots
- Easy and fast assembly
- For triflex® R mounting bracket with CFX clamps (TR.XX.20.30)
- For triflex® R mounting bracket with tiewrap plates (TR.XX21.30)
- For TR.XX.22.30 Quick exchange kit

triflex® R

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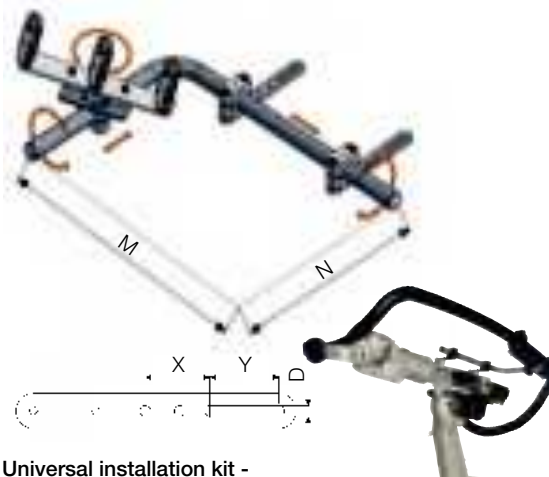




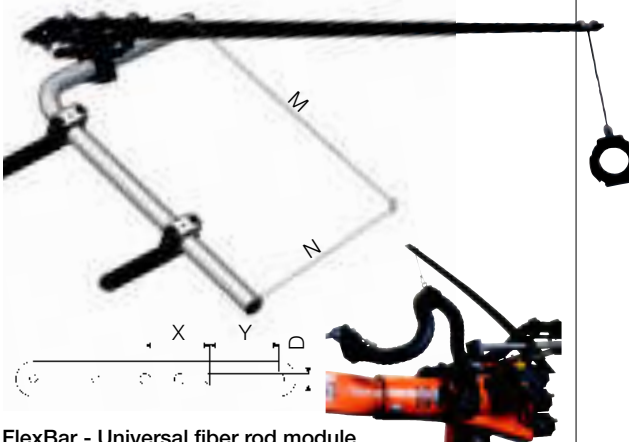
Other accessories available for special applications...



Fiber rod modules - Intelligent problem solution through directed pretension (for TRC/TRE)



Universal installation kit - Easy engineering of the fiber rods (for TRC/TRE)



FlexBar - Universal fiber rod module for extreme robotic movements (for TRC/TRE)

The igus® universal module as standard triflex® R-Set ▶ page 2.22

Fiber rod module, universal assembly kit and FlexBar as individual parts for triflex® R

**Fiber rod module:** For applications where too much flexibility is not desired. **Universal installation kit:** Universal installation kit allows the attachment of fiber rod modules in any given position, relative to the robotic arm. **FlexBar:** For robot-applications with extreme movements in the 4th to 6th axis and avoidance from loops

Product range - Fiber rods

Part No. TRC/TRE with mounted fiber rods	Length ca. [m]	max. load [kg/m]
triflex® R 40	TRC.F.40.1000.1.0/TRE.F.40.1000.1.0	1,0 0,4
	TRC.F.40.0900.1.0/TRE.F.40.0900.1.0	0,9 0,5
	TRC.F.40.0800.1.0/TRE.F.40.0800.1.0*	0,8 0,6
	TRC.F.40.0700.1.0/TRE.F.40.0700.1.0	0,7 0,7
	TRC.F.40.0600.1.0/TRE.F.40.0600.1.0	0,6 0,8
	TRC.F.40.0500.1.0/TRE.F.40.0500.1.0	0,5 0,9
triflex® R 60	TRC.F.60.1400.1.0/TRE.F.60.1400.1.0	1,4 1,0
	TRC.F.60.1200.1.0/TRE.F.60.1200.1.0	1,2 1,2
	TRC.F.60.1000.1.0/TRE.F.60.1000.1.0*	1,0 1,4
	TRC.F.60.0800.1.0/TRE.F.60.0800.1.0	0,8 1,6
	TRC.F.60.0600.1.0/TRE.F.60.0600.1.0	0,6 1,8
triflex® R 70	TRC.F.70.1800.1.0/TRE.F.70.1800.1.0	1,8 1,4
	TRC.F.70.1600.1.0/TRE.F.70.1600.1.0	1,6 1,6
	TRC.F.70.1400.1.0/TRE.F.70.1400.1.0	1,4 1,8
	TRC.F.70.1200.1.0/TRE.F.70.1200.1.0*	1,2 2
	TRC.F.70.1000.1.0/TRE.F.70.1000.1.0	1,0 2,2
triflex® R 85	TRC.F.85.2000.1.0/TRE.F.85.2000.1.0	2,0 1,4
	TRC.F.85.1800.1.0/TRE.F.85.1800.1.0	1,8 1,7
	TRC.F.85.1600.1.0/TRE.F.85.1600.1.0	1,6 1,9
	TRC.F.85.1400.1.0/TRE.F.85.1400.1.0*	1,4 2,1
	TRC.F.85.1200.1.0/TRE.F.85.1200.1.0	1,2 2,3
triflex® R 100	TRC.F.100.2000.1.0/TRE.F.100.2000.1.0	2,0 1,6
	TRC.F.100.1800.1.0/TRE.F.100.1800.1.0	1,8 2,0
	TRC.F.100.1400.1.0/TRE.F.100.1400.1.0*	1,4 2,4
	TRC.F.100.1600.1.0/TRE.F.100.1600.1.0	1,6 2,2
	TRC.F.100.1200.1.0/TRE.F.100.1200.1.0	1,2 2,6
TRC.F.100.1000.1.0/TRE.F.100.1000.1.0	1,0 3,0	

\*recommended lengths of the fiber rods

Product range - Universal installation kit

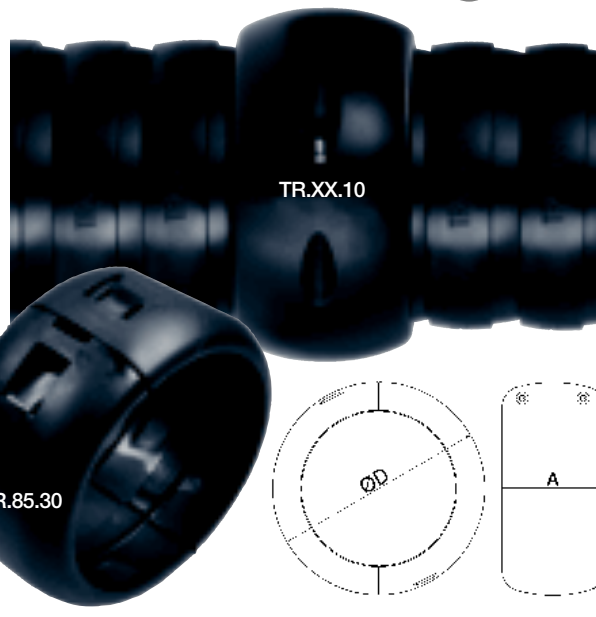
Installation kit for Series	Part No.	X [mm]	Y [mm]	M [mm]	N [mm]	D [mm]
TRC/TRE.40	▶ TR.40.80	40	30	475	325	6,3
TRC/TRE.60	▶ TR.60.80	40	30	475	325	6,3
TRC/TRE.70	▶ TR.70.80	75	80	875	575	12,5
TRC/TRE.85	▶ TR.85.80	75	80	875	575	12,5
TRC/TRE.100	▶ TR.100.80	75	80	875	575	12,5

Product range - FlexBar

FlexBar for Series	Part No.	X [mm]	Y [mm]	M [mm]	N [mm]	D [mm]
TRC/TRE.60	▶ TR.60.90	40	30	475	325	6,3
TRC/TRE.70	▶ TR.70.90	75	80	875	575	12,5
TRC/TRE.85	▶ TR.85.90	75	80	875	575	12,5
TRC/TRE.100	▶ TR.100.90	75	80	875	575	12,5

### triflex® R protectors - high safety under extreme operating conditions

- To achieve long life cycles under heavy loads resulting from impact or friction on the robot's e-chains®, optional protectors can be fitted at the contact points
- Easy assembly and quick replacement
- Abrasion-resistant TPU material
- Absorptive
- Light
- Easy gliding over edges
- Free positioning on any e-chain® link



For Series	Part No. protectors	Ø D [mm]	A [mm]
TRC/TRE.40	▶ TR.40.10	upon request	55 27
TRC/TRE.60	▶ TR.60.10	upon request	80 40
TRC/TRE.70	▶ TR.70.10	upon request	102 50
TRC/TRE.85	▶ TR.85.10 TR.85.30		118 59
TRC/TRE.100	▶ TR.100.10	upon request	133 67
TRC/TRE.125	▶ TR.125.10	upon request	170 82

triflex® R

### triflex® R cover: Heat shield - TR.XX.15

- Protection against weld spatter and metal splashes at temp. of up to 600°C (short-term)
- Base support: Fabric
- Coating: Aramid
- Easy to replace via longitudinally positioned velcro fastenings
- Elastic sealing strips
- Asbest-free
- Standard lengths available ex stock



For Series	TR.XX.15 Part No.	Standard lengths [mm]
TRC/TRE/TRL.40	▶ TR.40.15. YY = Jacket length	500 1000 1500 2000
TRC/TRE/TRL.60	▶ TR.60.15. YY	500 1000 1500 2000
TRC/TRE/TRL.70	▶ TR.70.15. YY	500 1000 1500 2000
TRC/TRE.85	▶ TR.85.15. YY	500 1000 1500 2000
TRC/TRE/TRL.100	▶ TR.100.15. YY	500 1000 1500 2000

### Standard protective jacket - TR.XX.16

- Temperature up to room temp.
- Base support: Fabric
- Coating: None
- Easy to replace via longitudinally positioned velcro fastenings
- Elastic sealing strips
- Silicon-free
- Standard lengths available ex stock



For Series	TR.XX.16 Part No.	Standard lengths [mm]
TRC/TRE/TRL.40	▶ TR.40.16. YY = Jacket length	500 1000 1500 2000
TRC/TRE/TRL.60	▶ TR.60.16. YY	500 1000 1500 2000
TRC/TRE/TRL.70	▶ TR.70.16. YY	500 1000 1500 2000
TRC/TRE.85	▶ TR.85.16. YY	500 1000 1500 2000
TRC/TRE/TRL.100	▶ TR.100.16. YY	500 1000 1500 2000

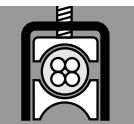
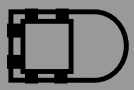
### Light protective jacket - TR.XX.17

- Temperature up to room temp.
- Base support: Fabric (spun-bonded web)
- Coating: None
- Easy to replace via longitudinally positioned velcro fastenings
- Elastic sealing strips
- Silicon-free
- Standard lengths available ex stock



For Series	TR.XX.17 Part No.	Standard lengths [mm]
TRC/TRE/TRL.40	▶ TR.40.17. YY = Jacket length	500 1000 1500 2000
TRC/TRE/TRL.60	▶ TR.60.17. YY	500 1000 1500 2000
TRC/TRE/TRL.70	▶ TR.70.17. YY	500 1000 1500 2000
TRC/TRE.85	▶ TR.85.17. YY	500 1000 1500 2000
TRC/TRE/TRL.100	▶ TR.100.17. YY	500 1000 1500 2000

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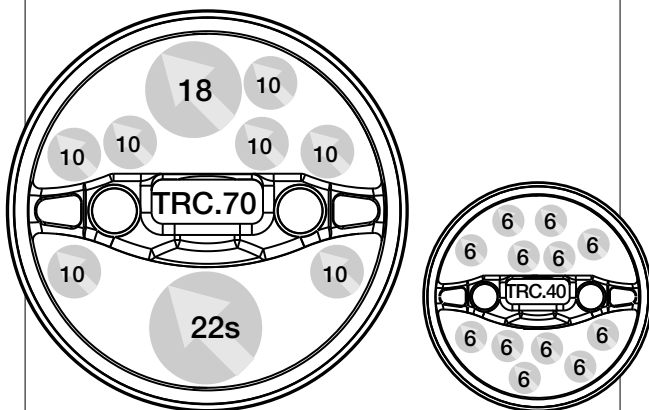
### Determining the cable area



Mounting bracket TR.70.01 - Strain relief for electric cables



We would be glad to help you in the selection of the right size with our triflex® R project planning software



Examples of filling TRC.70 and TRC.40

### Choice of the right e-chain® length

Filling and correct sizing - Clearance for cables and hoses is important when filling triflex® R, in order to compensate for friction forces due to relative movement between e-chain® and filling. The following serves as a rule of thumb: The total of all cable/hose diameters must not exceed 60% of the available cross section. A clearance of min. 10% (min. 1mm) needs to be maintained towards the next cable and the triflex® R. Please see the attached chart for available cross sections. igus® will be glad to run such calculations for you.

For Series	Effective areas [mm²]	For Series	Effective areas [mm²]
TRC/TRE.30	313	TRL.30	313
TRC/TRE.40	508	TRL.40	670
TRC/TRE.60	1144	TRL.60	1499
TRC/TRE.70	1788	TRL.70	2342
TRC/TRE.85	2431	-	-
TRC/TRE.100	3176	TRL.100	4125
TRC/TRE.125	4584	-	-

#### Example of determining cable area

$$A_{\text{Leitung}} = \frac{d^2 \times \pi}{4}$$

#### Examples :

$$\begin{aligned} A_1 &= (10 \text{ mm} \times 10 \text{ mm} \times \pi) / 4 \\ &= 78,5 \text{ mm}^2 \times 7 \text{ (number of cables)} \\ &= 549,50 \text{ mm}^2 \end{aligned}$$

$$\begin{aligned} A_2 &= (18 \text{ mm} \times 18 \text{ mm} \times \pi) / 4 \\ &= 254,34 \text{ mm}^2 \end{aligned}$$

$$\begin{aligned} A_3 &= (22 \text{ mm} \times 22 \text{ mm} \times \pi) / 4 \\ &= 379,94 \text{ mm}^2 \end{aligned}$$

$$A_{\text{Leitung}} = A_1 + A_2 + A_3 = 1183,7 \text{ mm}^2$$

The smaller the ratio between the effective area and the sum of the cable areas, the lower the load on the cables



### Customer-specific special cable for robotic and torsion applications

- Control, motor, servo, bus and data cables
- Shielded and unshielded
- Outer jacket material: PVC, PUR, TPE
- Special cables from 500 m
- Torsion area according to requirement
- Sectors: Robotic and 3D applications

The service life of cables in torsion applications depend disproportionately on the exact progression of the angle of torsion and the cable length of the exact application. As a single test facility is often insufficient, chainflex® cables are tested on various constructional systems. Your torsion cables are tested as realistic as possible for your application. For this purpose, igus® uses up to 8 different test facilities in the in-house laboratory.

### chainflex® robotic cables CF ROBOT - Twistable cables for robots available from stock

The proven CFROBOT cable family that is available from stock is now UL and CSA certified. All deliveries from 05/2011 are manufactured with the approvals.

- From 1 m, no minimum requirements
- ±180° on 1 m
- 3.000.000 cycles tested

More information ► [www.igus.eu/chainflexnews](http://www.igus.eu/chainflexnews)



**NEW** in this catalog  
**CF77.UL.D - chainflex® PUR control cable, ± 180° twistable**

For twistable load requirements

More information ► [www.igus.eu/chainflexnews](http://www.igus.eu/chainflexnews)



### triflex® R - readychain® cable packages for robots

High component holding times and low downtimes are of the highest priority in manufacturing plants. With a triflex® R readychain® we design and develop a customized readychain® system for you, consisting of the "construction kits" triflex® R, chainflex® and igus® connectors. An installation can of course be executed by our triflex® R installation engineers on your site.

#### Your advantages:

- Reduces your storage costs to zero for cables, e-chain® and connectors
- Cuts your running time by half
- Responds flexibly to order variations
- Minimize machine downtimes
- Reduce the number of suppliers and orders by 75%

3D-CAD files, pdf-downloads and many online features ► [www.triflex-r.eu](http://www.triflex-r.eu)

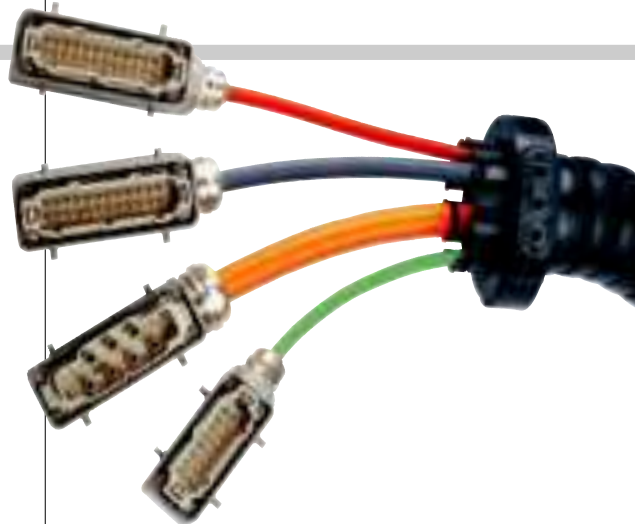
### triflex® R - Tests in the igus® lab



Testing facility at the igus® laboratory



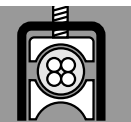
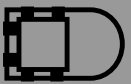
Torsion test of CF-ROBOT



Ready-made packages in 3 to 10 days

triflex® R

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







On-location assembly by the igus® specialist team



igus® system warranty - igus® warranty certificates will be issued for your application individually. "chain, cable, warranty"

## We maximize your robot application's service life

Robot applications are very diverse and sometimes extremely complex in terms of configuration. To maximize your robot application's service life with triflex® R, igus® has a specially trained, robotics planning and installation team which can install triflex® R e-chains® into your applications. Minimize your planning effort by delegating as many tasks as possible to us. Our trained staff offer support toward smooth project implementation every step of the way - whether you simply want to consult our assembly team or have an entire system of machines planned and installed. By telephone we can always provide answers to a host of questions and point out all the advantages of triflex® R for your company. On site, we can acquire all the data necessary for preparing detailed planning documents. From project planning through customized quotations right up to expert installation of the triflex® R on your site, we remain at your service round the clock.

- We also offer guarantee certificates for complete systems
- No minimum order quantities, no surcharges
- 1500 staff in Germany and at 26 international subsidiaries and offices. Stations in over 30 other countries

## Your advantage

- We are wherever you need us
- Your service requirements are fulfilled quickly by experts on location
- Guaranteed, fast worldwide delivery
- Spare parts are available from stock at short notice
- Order tracking via igus® "i-net" - [www.igus.de/en/i-net](http://www.igus.de/en/i-net)



iF-award-winning triflex® R TRE for a safe energy supply also in office equipment



Cable management in a TV studio with triflex® R



igus® System E6 and triflex® R TRE in a Y/Z-gantry



Torsion testing of triflex® R in the igus® laboratory, Cologne



igus® E2 e-tube and triflex® R in a processing machine



Optimal cable guidance even under extreme conditions, such as here in the Jungmeier roof tile plant

triflex® R

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