

# triflex<sup>®</sup>

## retraction system assembly instructions



RSE  
linear



RS



RSP



RSE  
Wheel

plastics for longer life<sup>®</sup>  
**igus<sup>®</sup>.com**  
[www.igus.com/triflexr](http://www.igus.com/triflexr)



RSP shown

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## **triflex® RSE Linear 6**

Linear retractions system that creates tension through the use of elastic bands

## **triflex® RSE Wheel 14**

Low payload retraction system that uses elastic bands to create tension

## **triflex® RS Modular 22**

Retraction system that utilizes tension rods as resistance

## **triflex® RSP Pneumatic 26**

Pneumatically driven retraction system that allows for tension adjustment

# Installation checklist ✓

- 1 Make sure that the ball end of triflex® R is run in the direction of the tool



- 2 Remember to use Lock Clips at every fixed bracket



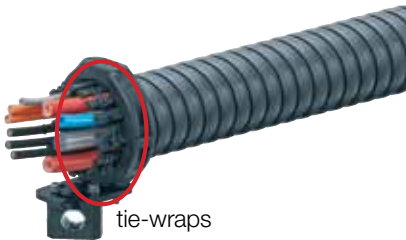
- 3 Ensure that triflex® R is run straight, not twisted



- 4 For the end of arm bracket to be installed correctly, triflex® R must run into the bracket, not across the pillow block support plate



- 5 Make sure all cables and hoses are strain relieved individually using tie-wraps or chainfix clamps



tie-wraps



chainfix clamps

# General Troubleshooting

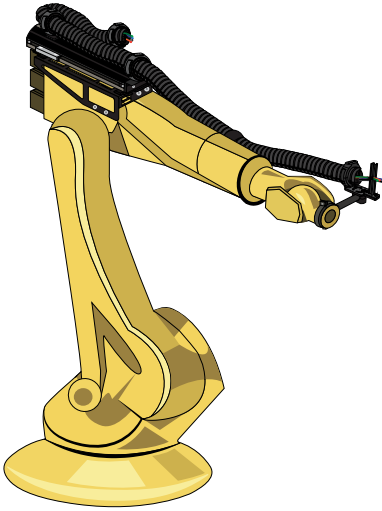
For system specific troubleshooting see the table at the end of each system assembly instructions.

Problem	Solution
triflex® R comes out of the end of arm bracket	<ol style="list-style-type: none"><li>1. Check to make sure Lock Clips are being used</li><li>2. Check to make sure that triflex® R is run in the correct direction with the ball end run in the direction of the tool</li><li>3. Ensure that the bend radius of the triflex® R is not being violated during the robot motion. To relieve this condition, adjust the end of arm bracket and axis 6 clamp</li></ol>
Cable breaks in the area of the end arm tool	<ol style="list-style-type: none"><li>1. Make sure strain relief has been properly installed at the end of arm bracket</li><li>2. Confirm that the service loop from the end of arm bracket to the tool connection is sufficient</li><li>3. Confirm that a torsion rated cable is being used. If not, contact igus</li></ol>
Cable is coming out of the split opening of triflex® R TRE	<ol style="list-style-type: none"><li>1. Make sure strain relief has been properly installed at the end of arm bracket</li><li>2. Confirm that the chamber inside triflex® R is not overloaded</li><li>3. Ensure that the cables entering the fixed end of the system at axis 3 are not pulled too tight</li></ol>
triflex® R TRE is getting caught on the robot and is damaged	<ol style="list-style-type: none"><li>1. Install a triflex® R protector in any location that makes contact with the robot arm. These should be installed 3-5 links apart</li></ol>

## Tools needed for installation:

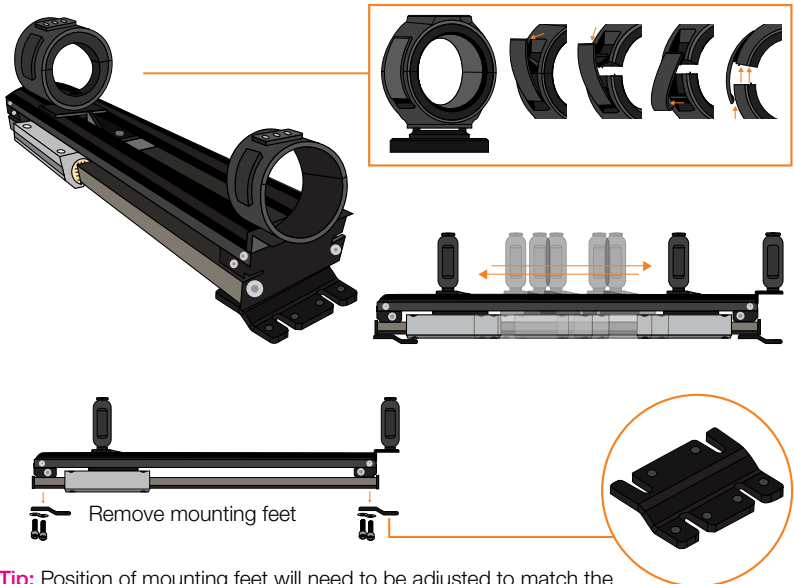


# RSE linear installation guide



Visit <https://toolbox.igus.com> and watch our video: How to install an igus triflex RSE cable management system on a six-axis robot

## RSE linear retraction system

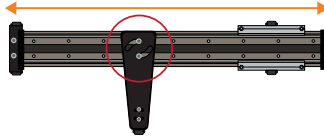
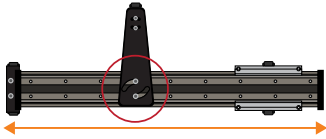


**Tip:** Position of mounting feet will need to be adjusted to match the mounting adapter

## RSE support bracket

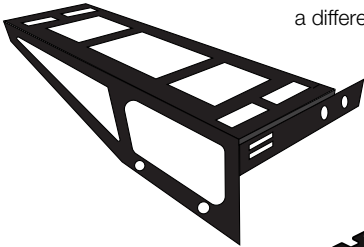


Mount the support bracket to the underside of the RSE linear system on either side



**Tip:** Mount the support bracket in the middle of the RSE.  
(support bracket not available for the 40mm and 50mm size)

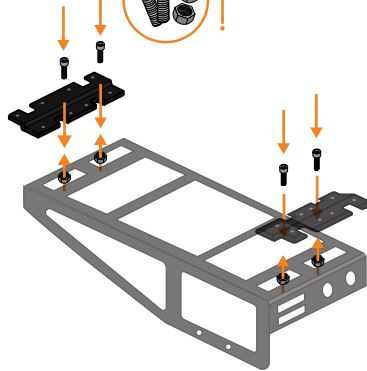
## Mounting adapter installation example



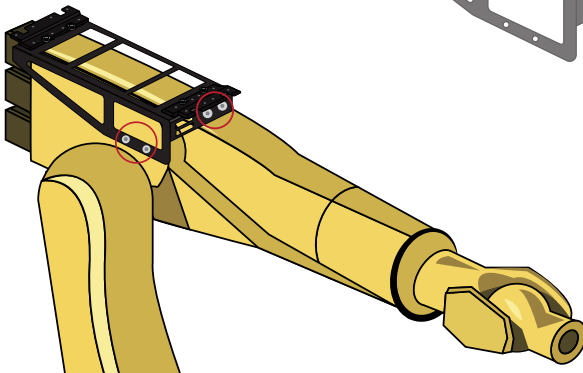
**Note:** Each robot model uses a different mounting adapter.



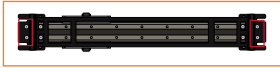
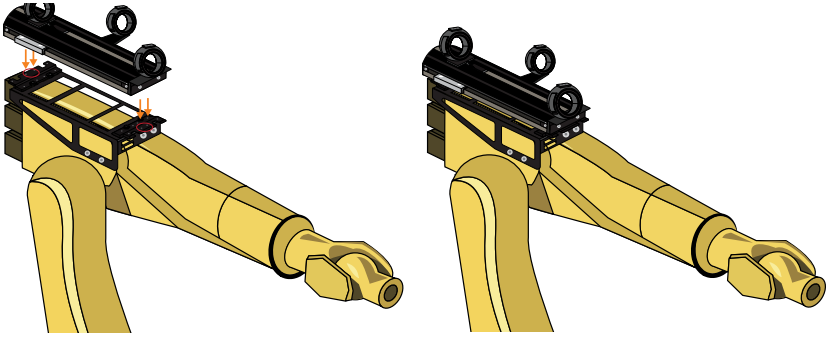
Fasten mounting feet and adapter together.



Install the mounting adapter on the robot

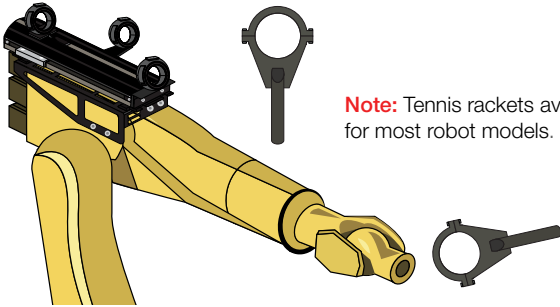


## Retraction system installation

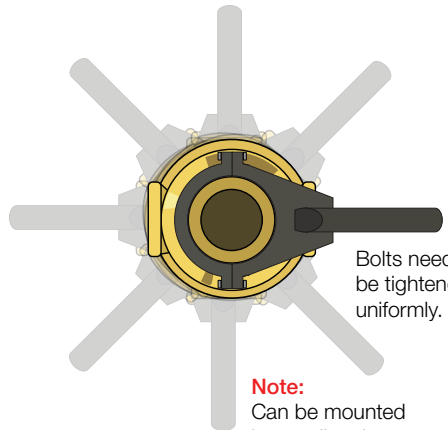
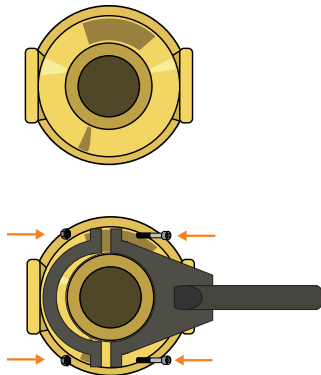


Bolts need to be tightened

## Tennis racket (axis 6 clamp) installation



**Note:** Tennis rackets available for most robot models.



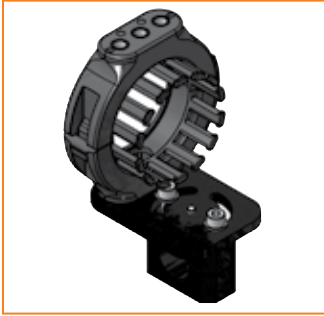
Bolts need to be tightened uniformly.

**Note:**  
Can be mounted in any direction

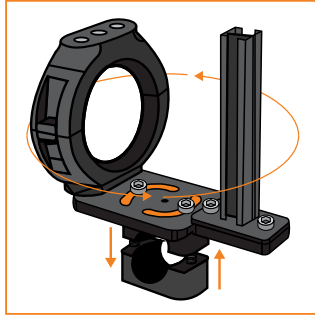


## Axis 6 bracket installation

### Standard bracket

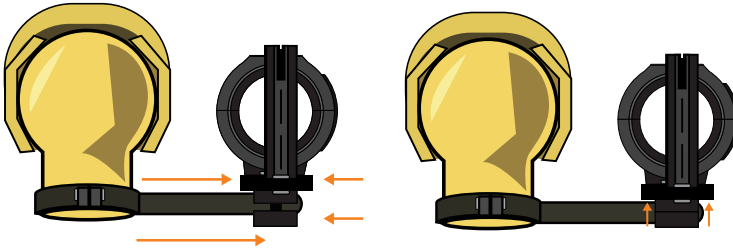
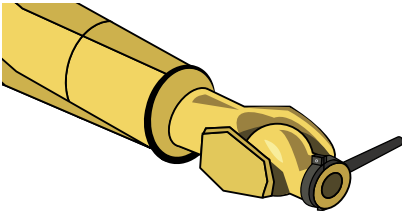


### Heavy duty bracket



Designed with integrated profile rail for CFX clamp

Adjustable in four directions

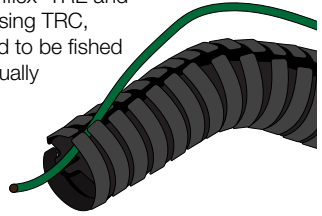


**Tip:** Install the bracket as close to the end of the handle as possible and tighten the bolts equally.

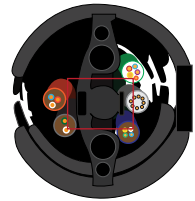
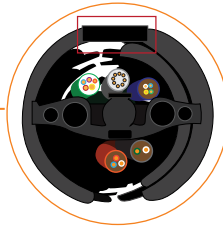
## triflex® R installation



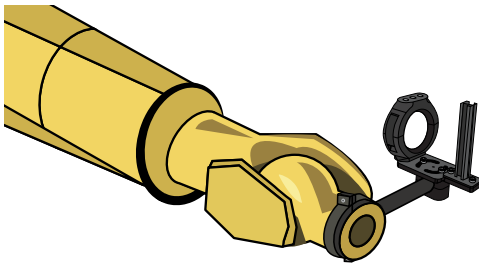
Note: Easy cable installation possible with triflex® TRE and TRCF only. If using TRC, cables will need to be fished through individually



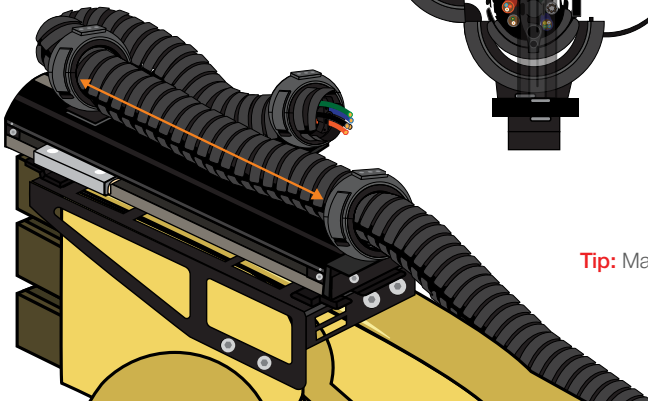
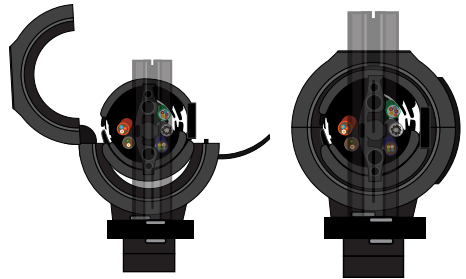
triflex® TRE only - install locking clips at each fixed bracket position



**Important:** Ball end of triflex® R at the EOAT (End of arm tooling)

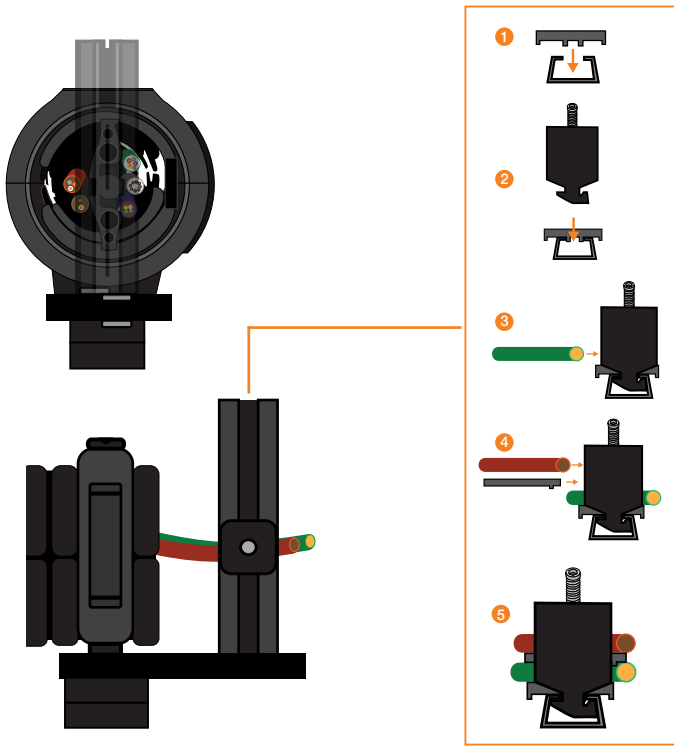


Install triflex® R in axis 6 mounting bracket first



**Tip:** Make sure triflex® R is not twisted

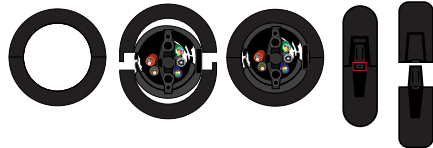
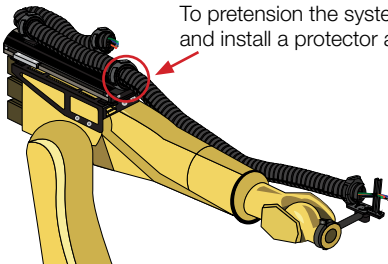
## Installing CFX clamps to secure cables



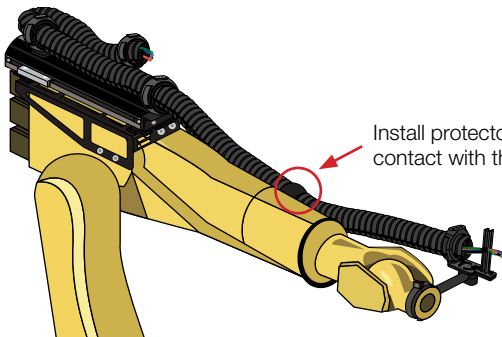
## Installing protectors

### Protector:

To pretension the system, pull the triflex® forward two links and install a protector at the exit of the moving end



**Tip:** For quick release protectors, use a flat head screwdriver to pry the two halves apart



Install protectors where triflex® R makes contact with the robot

# triflex® RSE linear troubleshooting guide

Problem	Solution
triflex® R is getting caught at the back of the rail as it is extending	1. Install RSE support bracket at midpoint of RSE rail
triflex® R breaks when RSE System is fully extended	2. Install more triflex® R outside the RSE System. The motion of the robot is greater than the available travel of the RSE System
RSE System does not function	1. Ensure the bands have tension 2. Confirm that the system is free of debris 3. Reduce the length of triflex® R outside the RSE System
Carriage slams when the robot returns to the home position	1. Pull the system forward two links and install a protector at the exit of the pass-through bracket thereby creating a stop

 YouTube



Scan the QR code to view the  
triflex® RSE Linear assembly video

# triflex® RSE linear

## Installation examples



# RSE Wheel installation guide

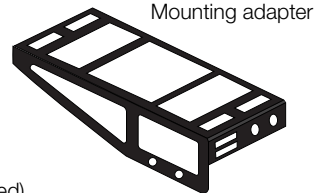


## RSE Wheel retraction system



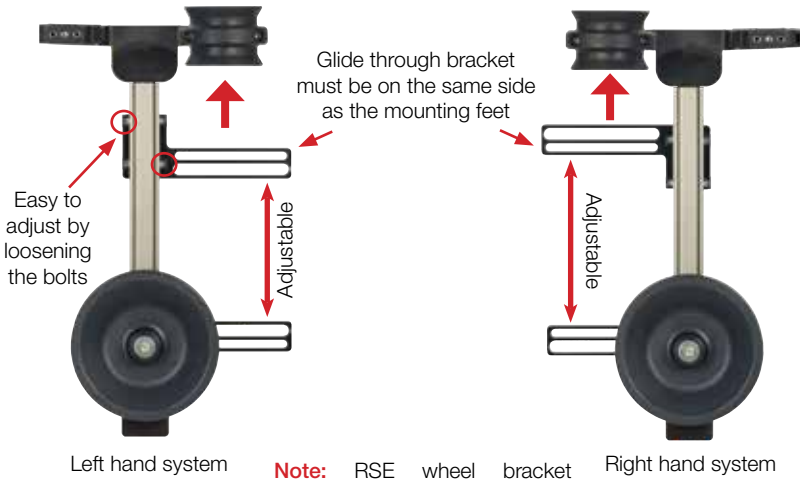
Protector  
(Minimum 3 required)

**Note:** Axis 3 mounting adapters available for most robot models



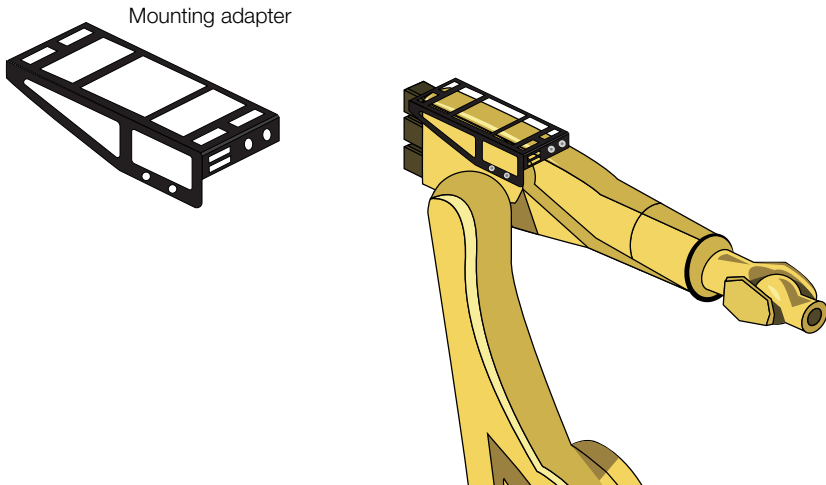
Mounting adapter

## Configuring the retraction system

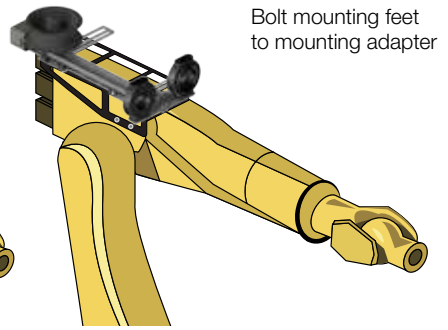
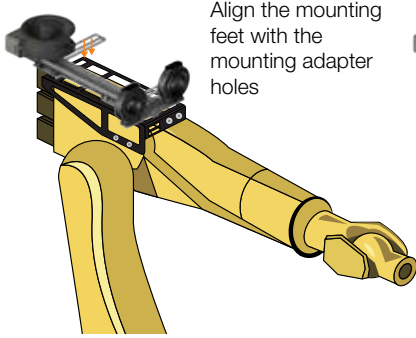


**Note:** RSE wheel bracket arrangement can be modified to opposite side if needed. Remember to keep mounting feet on the same side as the glide-through bracket

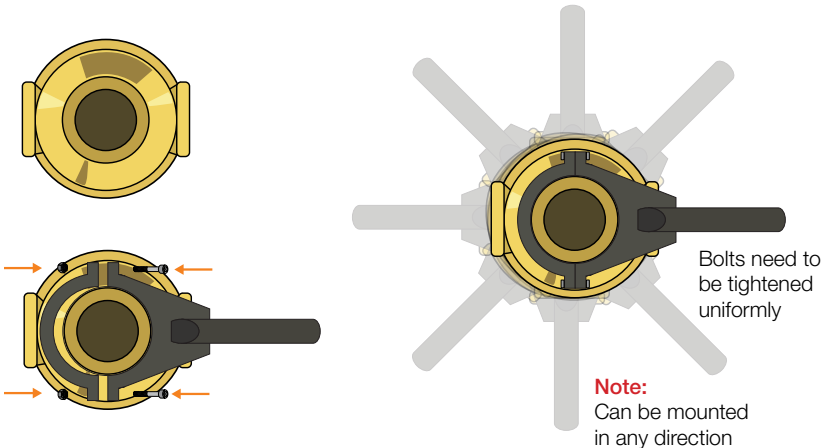
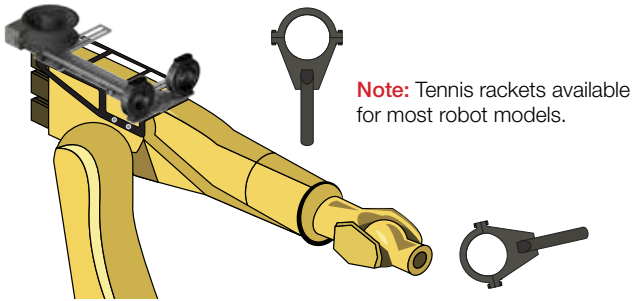
## Mounting adapter installation example



## Retraction system installation



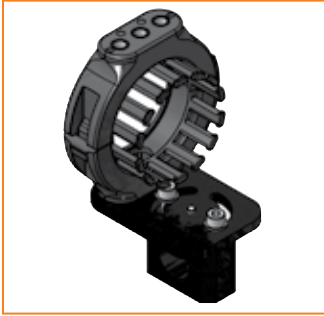
## Tennis racket (axis 6 clamp) installation



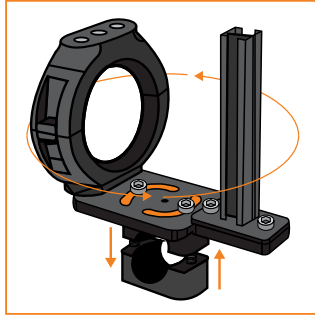


# Axis 6 bracket installation

## Standard bracket

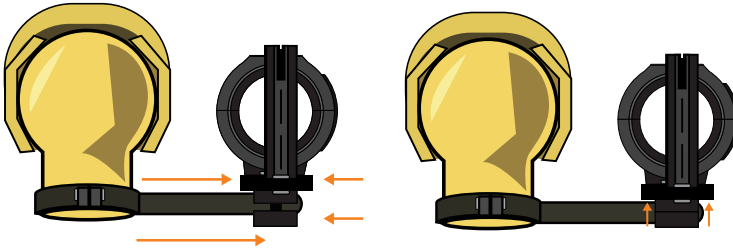
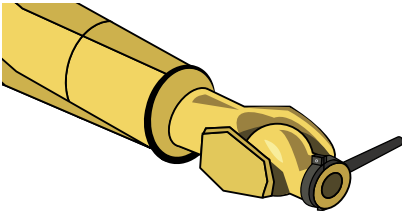


## Heavy duty bracket



Designed with integrated profile rail for CFX clamp

Adjustable in four directions

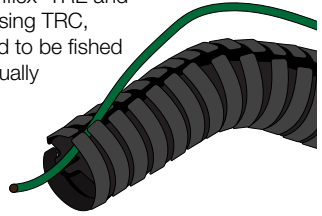


**Tip:** Install the bracket as close to the end of the handle as possible and tighten the bolts equally.

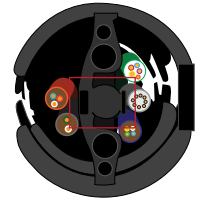
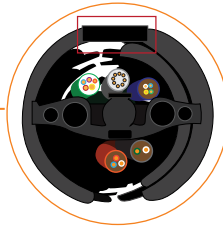
## triflex® R installation



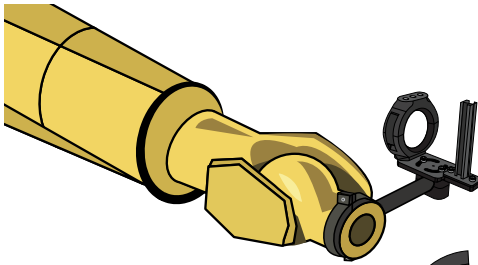
Note: Easy cable installation possible with triflex® TRE and TRCF only. If using TRC, cables will need to be fished through individually



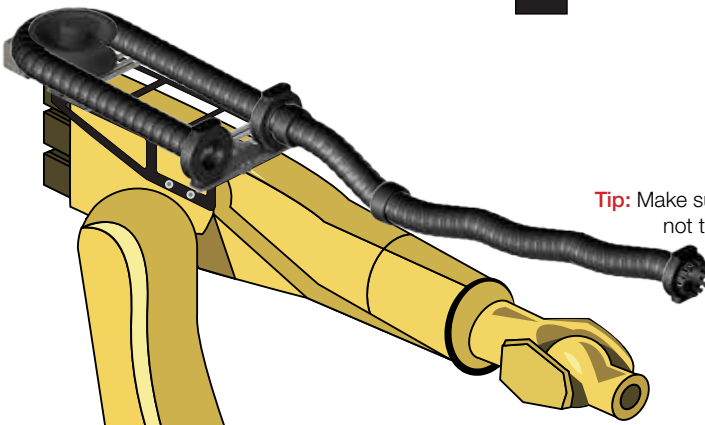
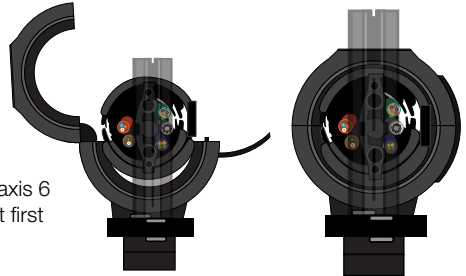
triflex® TRE only - install locking clips at each fixed bracket position



**Important:** Ball end of triflex® R at the EOAT (End of arm tooling)

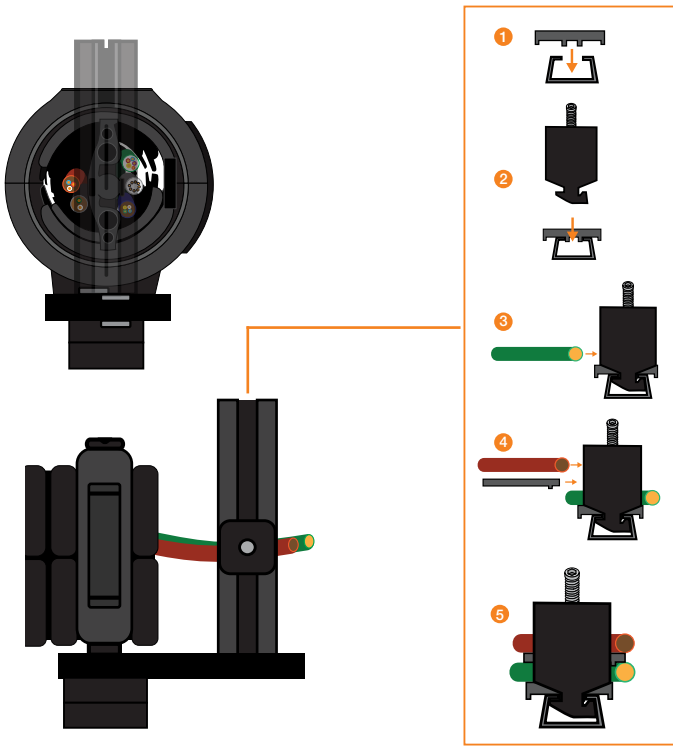


Install triflex® R in axis 6 mounting bracket first

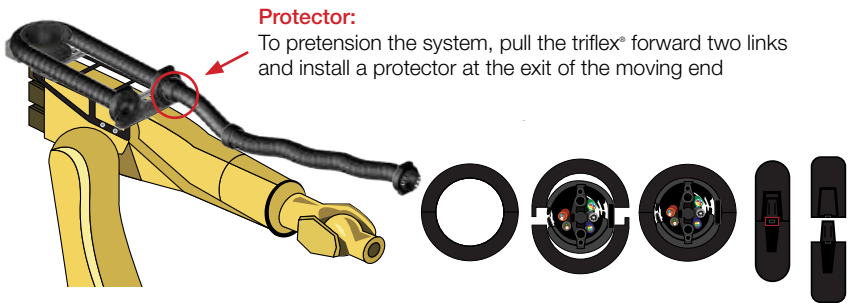


**Tip:** Make sure triflex® R is not twisted

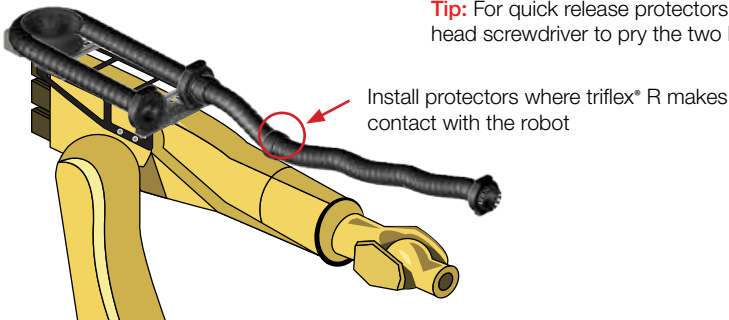
## Installing CFX clamps to secure cables



## Installing protectors



**Tip:** For quick release protectors, use a flat head screwdriver to pry the two halves apart



# triflex® RSE WHEEL

## troubleshooting guide

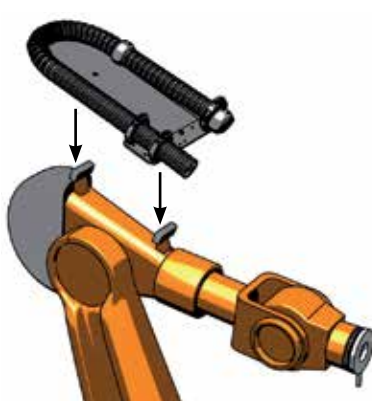
Problem	Solution
triflex® R breaks when RSE System is fully extended	1. Install more triflex® R outside the RSE System. The motion of the robot is greater than the available travel of the RSE System
RSE System does not function	1. Ensure the bands have tension 2. Confirm that the system is free of debris 3. Reduce the length of the triflex® R outside the RSE System
Carriage slams when the robot returns to the hom position	1. Pull the system forward four links and install a protector at the exit of the pass-through bracket thereby creating a stop

# triflex® RSE Wheel Installation examples



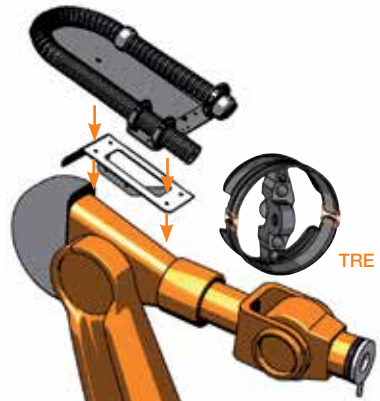
# triflex® RS installation guide for TRC and TRE system

Mount the pre-assembled triflex® RS on the robot.



Mounting without triflex® RS adapter

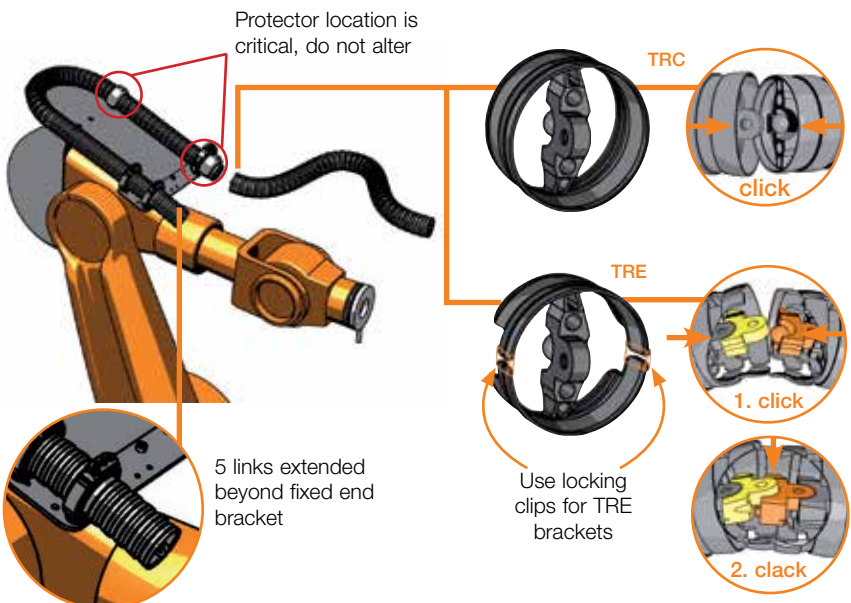
Mount the triflex® RS directly to the robot if the hole pattern is identical to that of the robot



Mounting with triflex® RS adapter

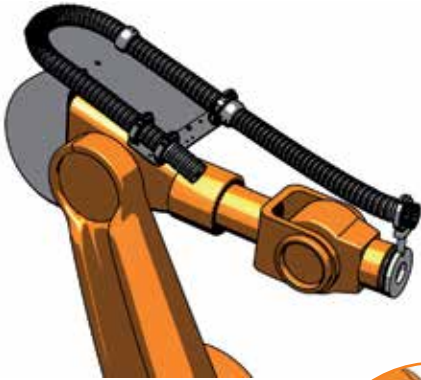
If the triflex® RS hole pattern is different to that of the robot, install the mounting adapter first to the robot and then the RS system to the mounting adapter

Mount moving end of triflex® R chain and adjust length.



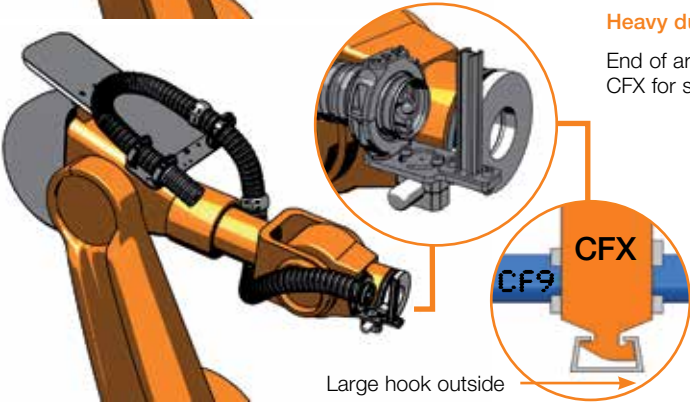


Install mounting bracket with strain relief on the moving end and fasten triflex® R.



**Standard bracket**

End of arm bracket with tie-wrap teeth for strain relief.



**Heavy duty bracket**

End of arm bracket with CFX for strain relief.

Install protectors where triflex® R makes contact with robot arm



# triflex® RS

## troubleshooting guide

Problem	Solution
Fiber rods are damaged	<ol style="list-style-type: none"><li>1. Ensure that there are five links exposed at the fixed end bracket</li><li>2. Confirm that the fiber rods are installed in a vertical position</li><li>3. Confirm that the “stroke limiting” protector inside the RS system is installed in the correct position. Stickers indicating its position are installed at the factory</li></ol>
RS System is not retracting completely	<ol style="list-style-type: none"><li>1. Confirm that the fiber rods are intact</li><li>2. Check to see that the “tension” protector at the exit of the pass through bracket is installed in the correct position. Stickers indicating its position are installed at the factory</li></ol>

 YouTube

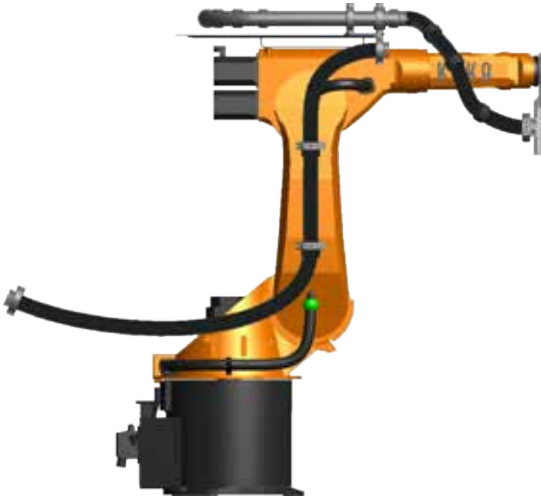


Scan the QR code to view the  
triflex® RS assembly video



# triflex® RS

## Installation examples

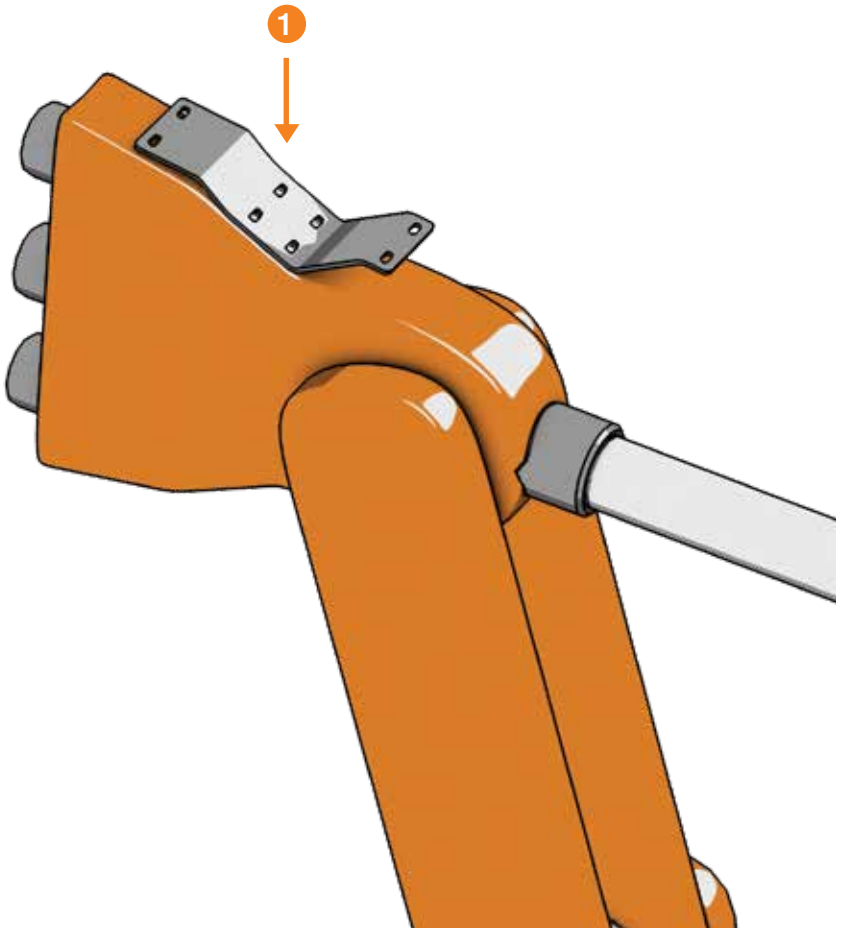


# triflex® RSP installation guide

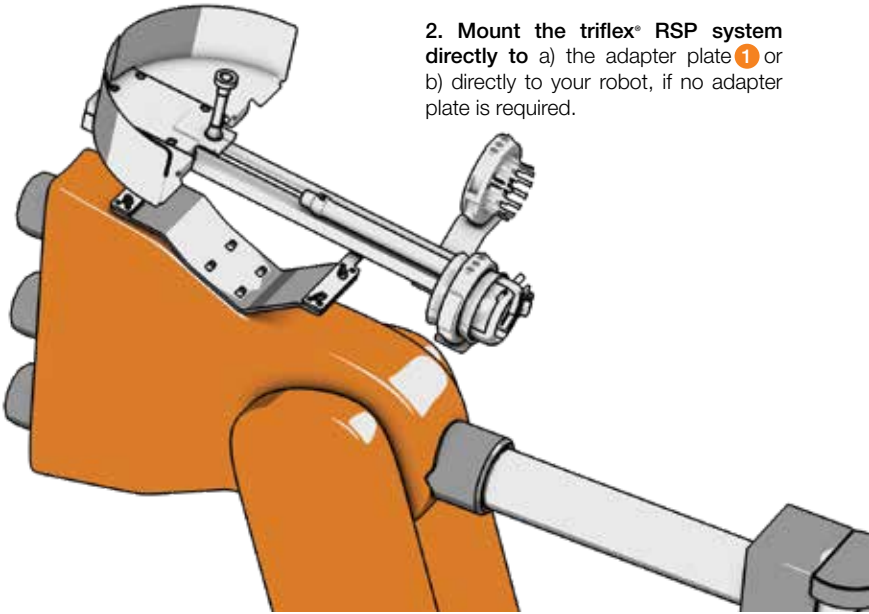
## Mounting with adapter plate

The triflex® RSP system requires a mounting adapter for most robot models. triflex® RSP systems can be mounted to some Kuka robots with an adapter.

1. Mount Adapter plate **1** on robot axis 3.

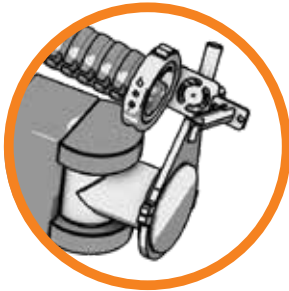
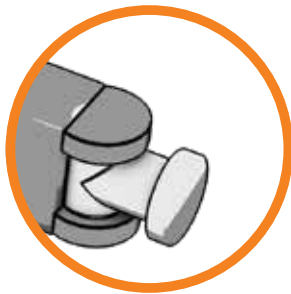


2. Mount the triflex® RSP system directly to a) the adapter plate ① or b) directly to your robot, if no adapter plate is required.



3. Mount the "tennis racket" ② on axis 6 of the robot and

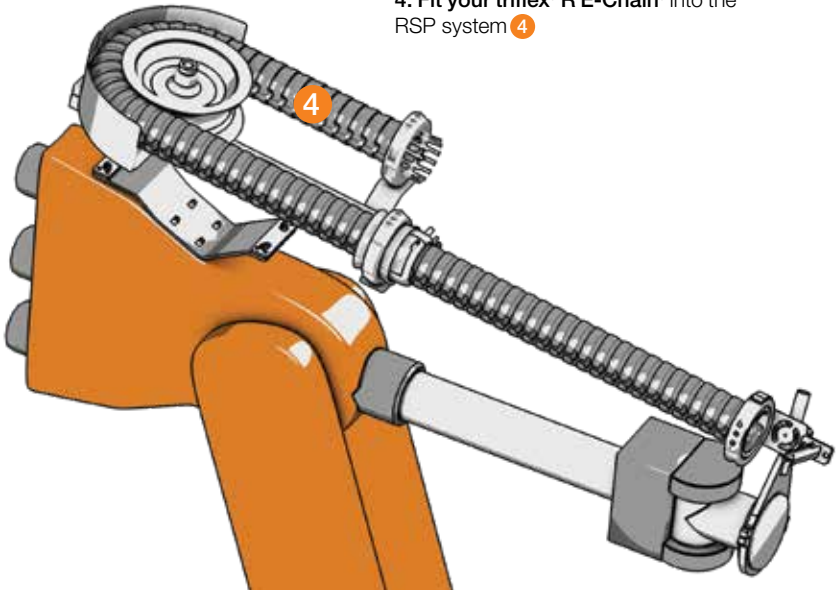
then the adjustable triflex® R mounting bracket to the shaft ③



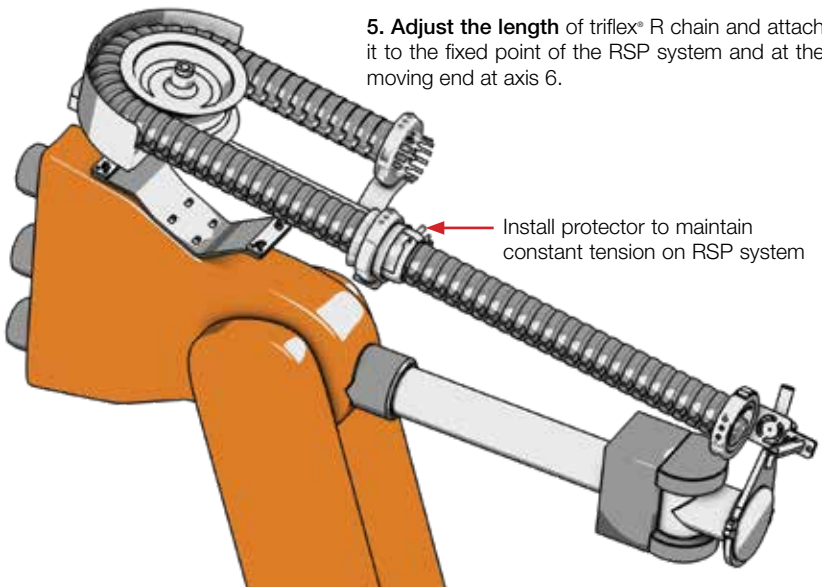
**Note:** Mounting bracket will be delivered as a complete assembled set.

## Adjust length


4. Fit your triflex® R E-Chain® into the RSP system 4



5. Adjust the length of triflex® R chain and attach it to the fixed point of the RSP system and at the moving end at axis 6.

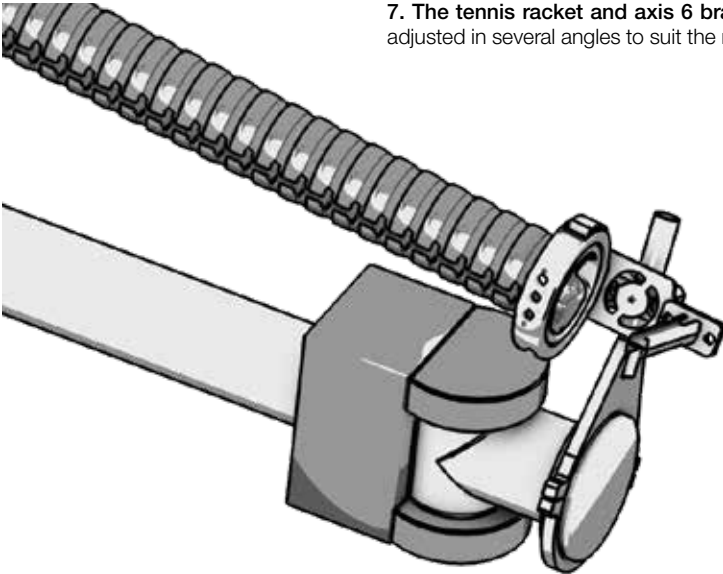


## Align

6. **\*\*Note: for triflex® TRE only.** Please install lock clips  at all fixed bracket locations

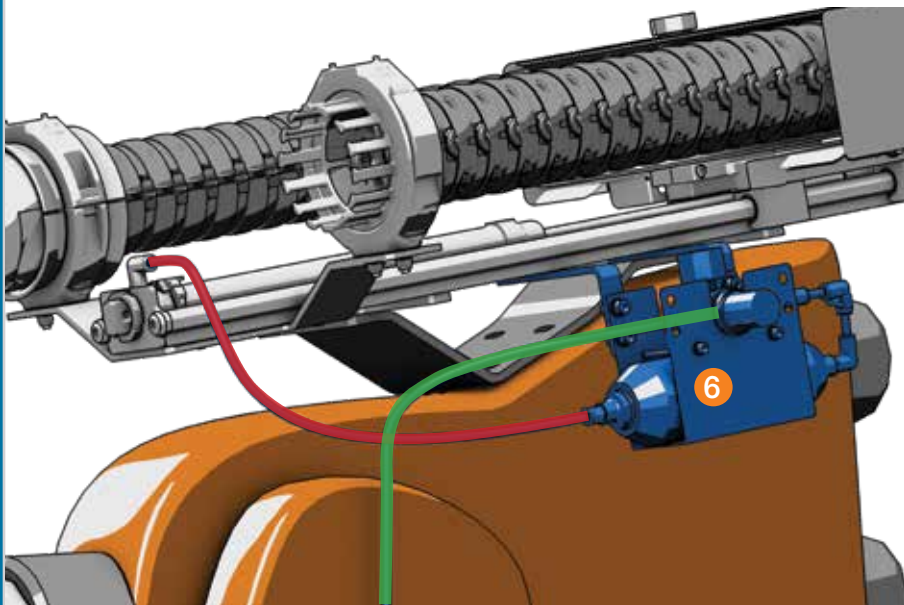


7. The tennis racket and axis 6 bracket can be adjusted in several angles to suit the robot motion.

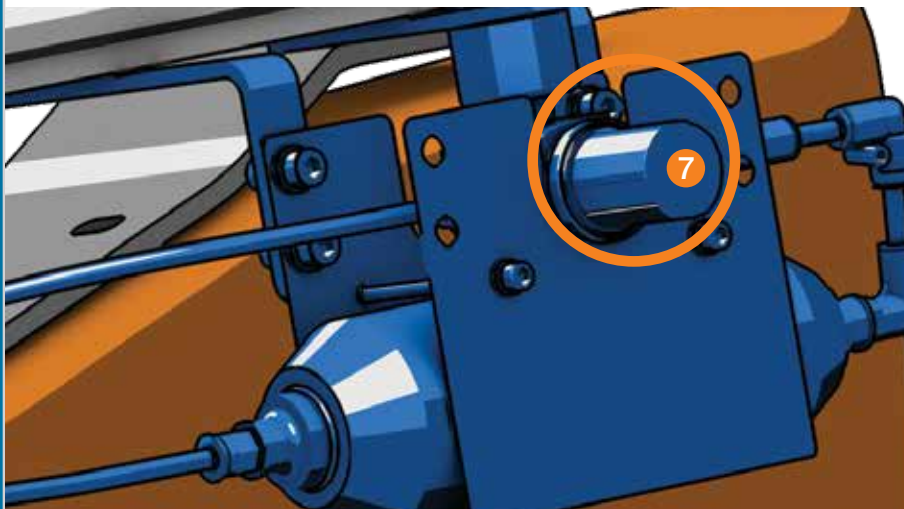


## Pressure compensation

**8.1 Connecting the pressure equalizing unit** **6** Connect the supplied 1m hose (red) to the RSP unit. The other line is your air supply (green) and is attached to your compressed air system.



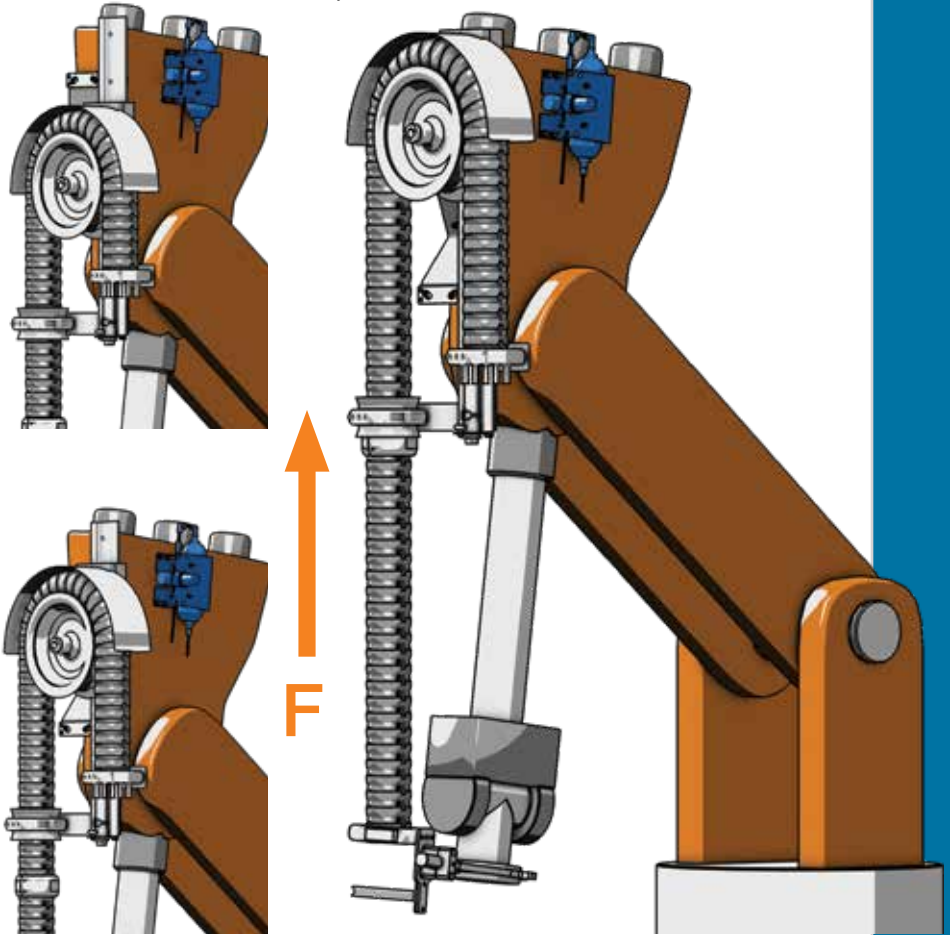
**8.2 Adjust air pressure** **7** using pressure reducing valve. The correct pressure is between 2 (29 PSI) and 4 bar (87 PSI).



## Optimal setting

**8.3 For the most accurate pressure setting** fill the triflex® R with cables and hoses and run the robot in a vertical position with axis 6 downwards. Increase the air pressure until the wheel returns to the home position (**F**). Take note of the pressure required to return the wheel to the home position. This setting is the maximum force required and should not be increased.

End position



# triflex® RSP troubleshooting guide

Problem	Solution
RSP System does not have enough tension to retract the dresspack	1. The air pressure is too low. Remove the air from the system and repeat step 8, 9 & 10 from the install manual
RSP System has too much tension and the triflex® R is breaking	2. The air pressure is too high. Remove the air from the system and repeat step 8, 9 & 10 from the install manual

 YouTube

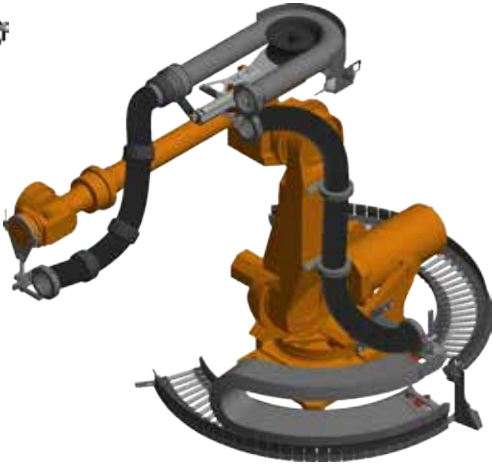


Scan the QR code to view the  
triflex® RSP assembly video



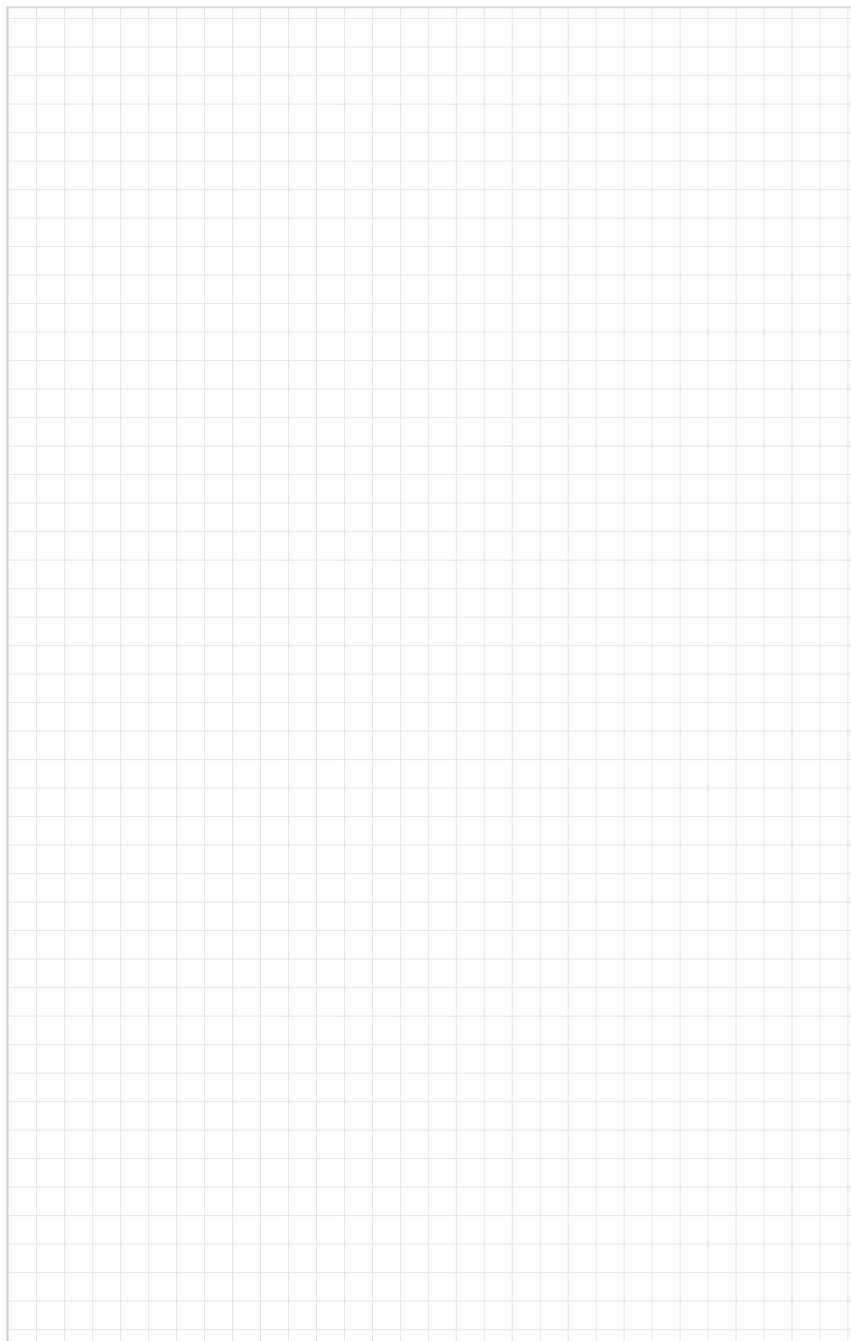
# triflex® RSP

## Installation examples



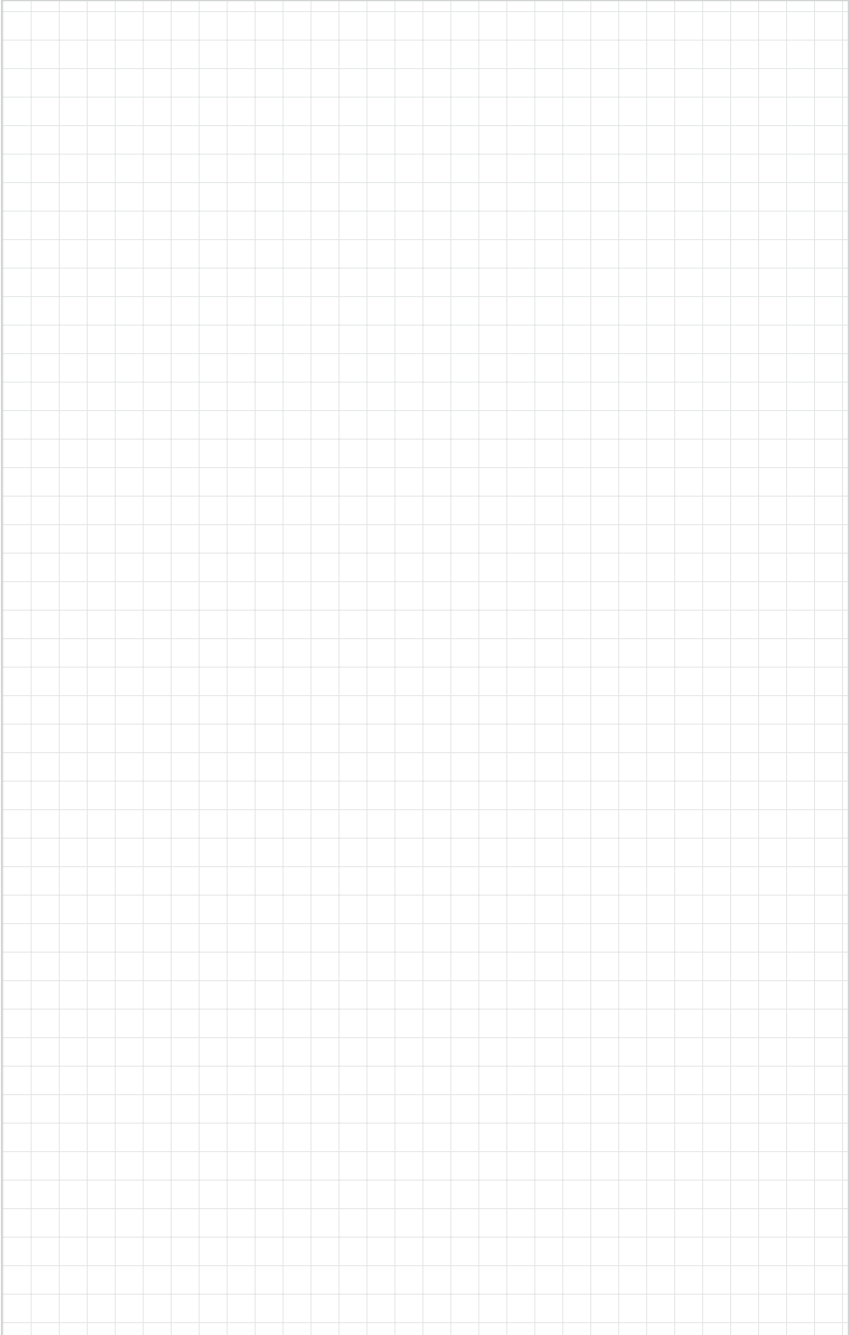
# Assembly guide notes

## Notes

A large grid of graph paper for taking notes. The grid consists of 20 columns and 30 rows of small squares, providing a structured area for writing or drawing.

# Assembly guide notes

## Notes

A large grid of graph paper for taking notes, consisting of 30 columns and 40 rows of small squares.

# 9001:2015

igus® is certified in accordance with ISO 9001:2015 and ISO/TS 16949:2009 in the field of energy supply systems, cables and harnessing, as well as plastic bearings.

The logo for igus, featuring the word "igus" in a stylized, lowercase, orange font. A horizontal line passes through the middle of the letters, with the 'i' and 'g' having a small vertical bar at the top and bottom respectively, and the 'u' and 's' having a small vertical bar at the top and bottom respectively. A registered trademark symbol (®) is located to the right of the 's'.

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# plastics!!!