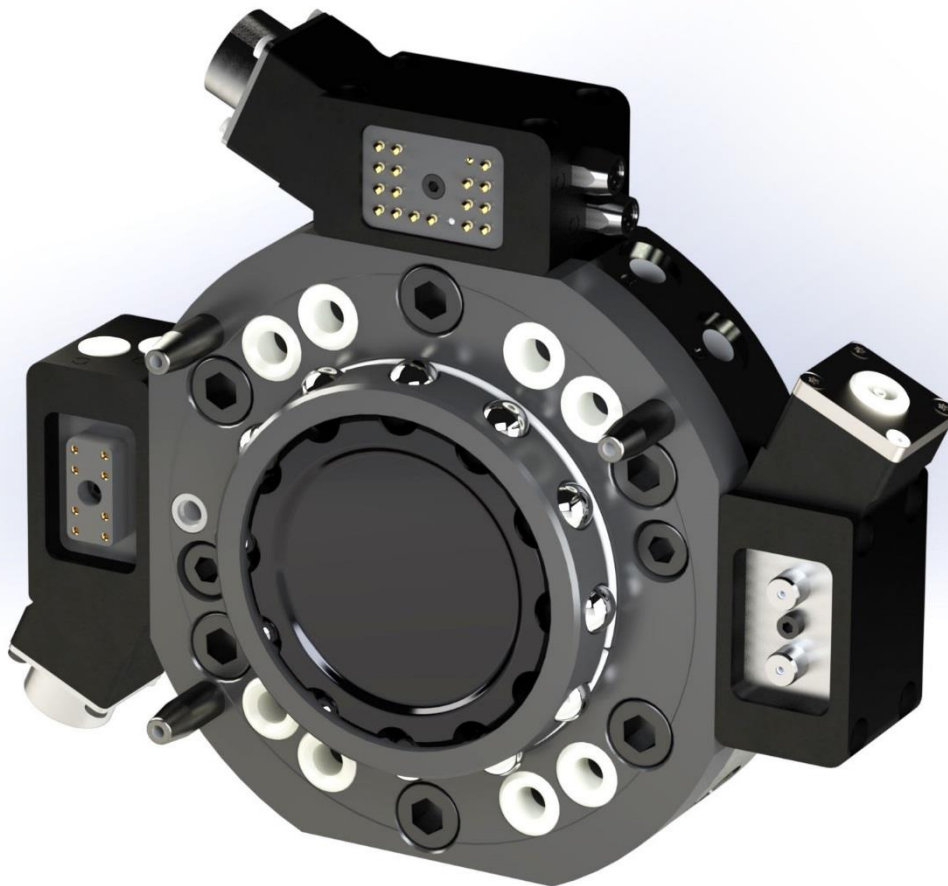


# Installation and Maintenance

## Tool changers TC60, TC120, TC180

M0627-1

Tool changers | Swivels | Swivels with Tool changers | Grippers | Hose packages | Valve Units | Tool systems





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# 1 INTRODUCTION

**Robot System Products** is a front-rank provider of peripheral products for high performance robot applications. We provide complete tool systems solutions for your robot installations, aiming to improve your productivity with the most reliable and cost-effective tooling on the market. Continuously we explore emerging technologies, working with leading edge design.

**Robot System Products** has a wide range of standard robot peripheral products:



- Tool changers
- Swivels
- Swivel tool changers
- CiRo
- Grippers
- Hose Packages
- Valve units
- Tool systems
- Tool parking systems

**Robot System Products'** tool changers are constructed to maximize the flexibility and reliability of your robot fleet. Through our patented locking device TrueConnect™ robustness and high safety are combined with low weight and compactness. With our swivels compressed air, water, electrical and data signals as well as weld and servo power are transferred to your tools with robot motion capabilities fully maintained. Our swivel tool changers unite the TrueConnect™ mechanism with our swivel technology, combining the best out of the two technologies. With RSP's cost-effective CiRo, cables and hoses can be freely selected with high robot flexibility maintained, and space requirements reduced. Our integrated tool systems are delivered as complete plug-and-play solutions designed for quick and simple installation.

**Robot System Products'** product lines are available for all major robot brands and come with complete documentation. 3D-models for simulation are available for download at: [robotsystemproducts.com](http://robotsystemproducts.com).

## 1.1 Installation and Maintenance manual

This document describes how the tools changers, TC60, TC120 and TC180, including corresponding tool attachments and options for transfer of power, signals, water and air are installed and replaced. In addition, the document describes required maintenance activities, including inspection, cleaning, lubrication, replacement of wear parts, required tools and products and disposal and recycling.

The document, *Product Description* (M0626-1) contains product information, drawings, technical data, electrical and pneumatic diagrams, safety software function and lists of spare parts.

## 1.2 Safety

### 1.2.1 General

The integrator installing the tool changer into the system must follow the safety demands stated in standards and provisions applicable in the country where the tool changer system is to be installed. The products are all prepared for CE-certification.

The user of the Robot System Products tool changer is responsible that law and directives applicable in respective countries, with regards to safety, are followed. The user is also responsible to guarantee that all safety devices are installed correctly.



**WARNING!**

Never carry out service work on a robot that has not been taken out of operation. See safety information for the robot.



**WARNING!**

Only perform work on grippers or tools attached to the tool changer if the air pressure is safely switched off.



**WARNING!**

Be aware that tool changer and tool attachment are heavy and may cause personal injury and equipment damage if dropped.



**NOTE!**

The tool changer shall always be in locked position, also when empty, to avoid unexpected locking if air pressure is lost.

### 1.2.2 Explanation of warnings

The warnings in this document are specific to the products in this manual. It is expected that the user also pay attention to certain notifications from the robot manufacturer and/or the manufacturers of other components used in the installation.



**WARNING!**

The warning sign will make you aware that a situation could result in potential serious injury or damage to equipment.



**NOTE!**

The note sign will alert you about something important to consider.

## 1.3 Tightening torques

### Tightening torques for mounting (screw class 8.8)

Dimension	Torque
M4	3 Nm
M5	6 Nm
M6	10 Nm
M8	24 Nm
M10	47 Nm
M12	82 Nm
M16	200 Nm

## 1.4 Recommended equipment

### Equipment recommended for installation and maintenance work

Tools	Applications
Complete set of Allen keys	For all socket head cap screws
Torque wrench	For dismounting and mounting
Torx keys	For dismounting and mounting
Plastic mallet	For mounting of air sealings
Pair of pliers	For dismounting the signal pins
Guide pin puller (VA0182-001)	For dismounting the guide pins
2 x 13 mm spanners	For dismounting the guide pins
Screw driver	For removing the air sealings

## 1.5 Required products

Product	Specification	Note
Grease I1934	Renolit HLT2	For air sealings, guide pins, guide holes and locking balls.
Cleaning agent	Industrial alcohol or similar	For cleaning of tool changer and tool attachment.
Glue	Loctite 6300 (or similar)	For gluing the guide pins.
Glue	Loctite 480 (or similar)	For gluing air sealings (TC60, TC120 and option two air, P1325).
Cloth	Lint free cloth	For cleaning.

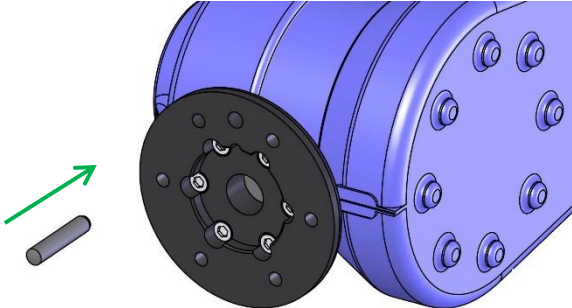
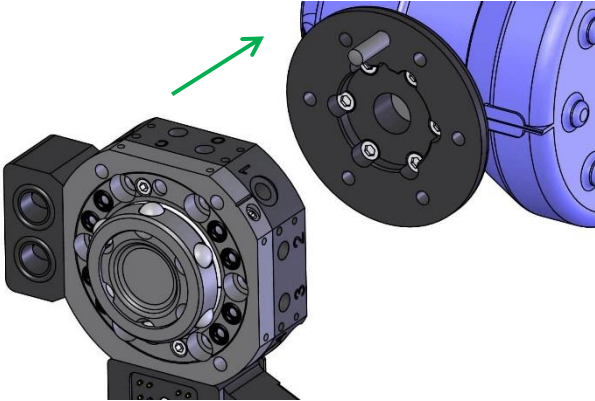
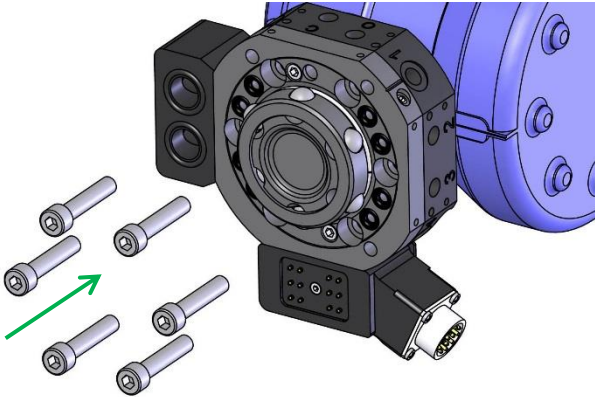


**NOTE!** Chemical resistance protective gloves are recommended when using grease or cleaning agents such as industrial alcohol. Safety goggles are recommended when working with cleaning agents such as industrial alcohol. Adequate ventilation should be provided when chemical substances are used.

## 2 INSTALLATION

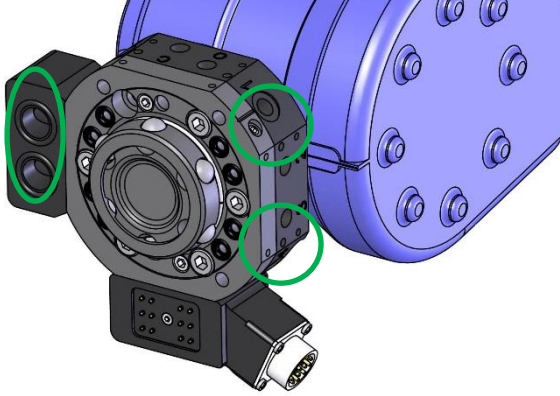
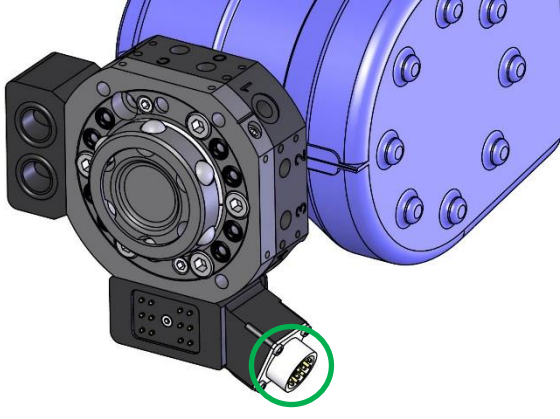
### 2.1 Installation of tool changer on robot



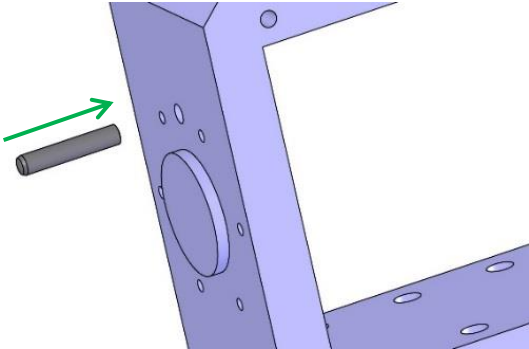
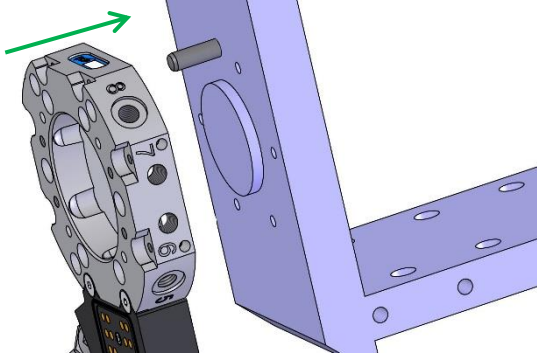
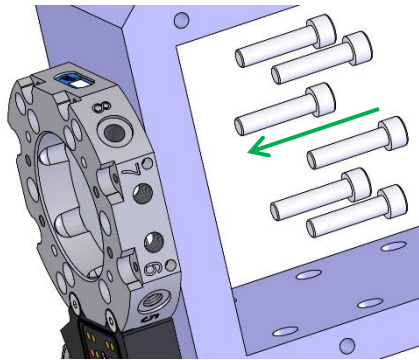
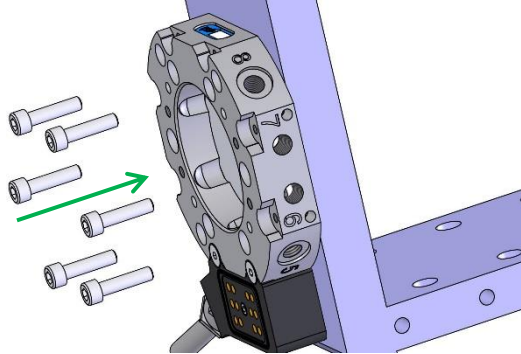
	Action	Note
1	<b>Safety</b>	Read the safety section (1.2).
2	<b>Service position</b>	Place the robot in service position
3	<b>Power off</b>	Switch the power off and lock the circuit breaker <b>NOTE!</b> Read the safety chapter for the robot.
4	<b>Mount guide pin</b> 	Press the enclosed guide pin into the robot flange. <i>Alternatively, if adaptation plate is used:</i> Mount the adaptation plate on the robot flange (see tightening torques above). Press the enclosed guide pin into the adaptation plate.
5	<b>Fit tool changer</b> 	Lift and the tool changer to the robot flange (or adaptation plate). Make sure that the guide pin is fitted to the guide hole in the tool changer.  <b>WARNING!</b> The tool changer is heavy and may cause personal injury and equipment damage if dropped.
6	<b>Mount tool changer</b> 	Mount the tool changer with the enclosed screws. Use an Allen key for tightening (see tightening torques above).

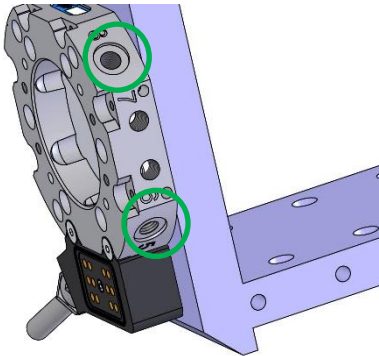
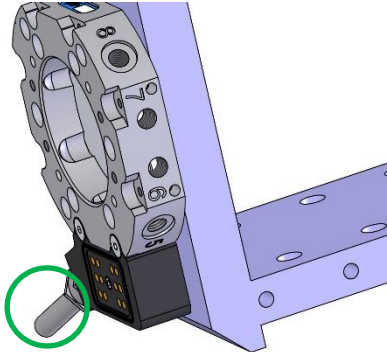




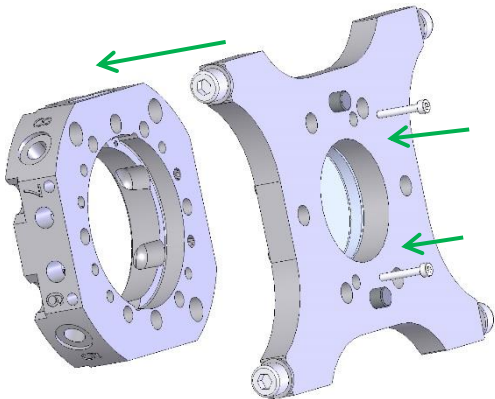
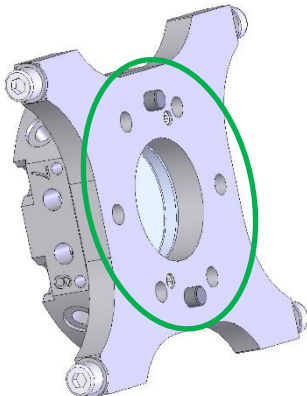
7	<b>Connect air hoses</b> 	<p>Connect air hoses to the hose fittings.</p> <p>Pneumatic diagrams are found in the Product Description of respective unit.</p>
8	<b>Connect signals</b> 	<p>Connect electrical connectors in accordance with selected options.</p> <p>Circuit diagrams are found in the Product Description of respective unit.</p>
9	<b>Power on</b>	<p>Unlock circuit breaker and switch power on.</p>

## 2.2 Installation of tool attachment to tool

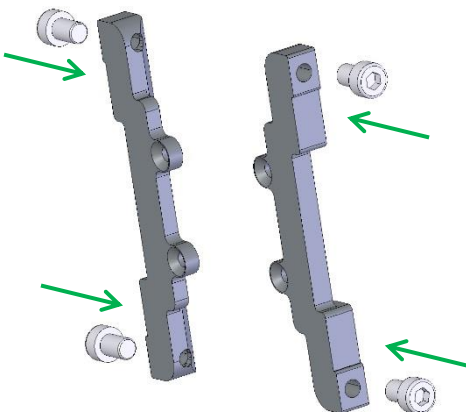
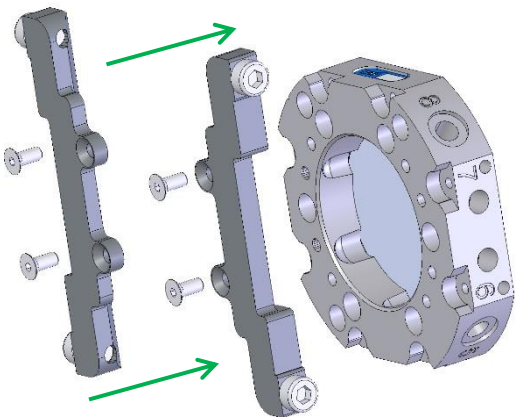
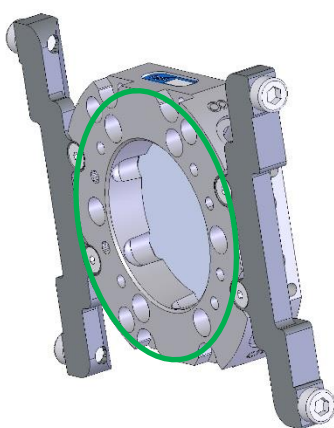
	Action	Note
1	<b>Safety</b>	Read the safety section (1.2).
2	<b>Mount guide pin</b> 	Press, when required, a guide pin (CPK 8x) into its position on the tool.
3	<b>Fit tool attachment</b> 	Lift the tool attachment to the tool and fit using the guide pin, if applicable, into its appropriate guide hole.
4	<b>Mount tool attachment on tool</b>  <p>M6/M8</p>	<p>Mount tool attachment from the tool side using a torque wrench.</p> <p>Screws are specified in the Product Description of respective tool attachment. See tightening torques above.</p>
	 <p>M8/M10</p>	<p><i>Alternatively:</i> mount tool from the tool attachment side using a torque wrench.</p> <p>Screws are specified in the Product Description of respective tool attachment. See tightening torques above.</p>

5	<b>Connect air hoses</b> 	<p>Connect air hoses to the hose fittings on the tool attachment or selected option.</p> <p>Pneumatic diagrams are found in the Product Description of respective unit.</p>
6	<b>Connect signals</b> 	<p>Connect electrical connectors in accordance with selected options.</p> <p>Circuit diagrams are found in the Product Description of respective unit.</p>

## 2.3 Mounting of parking bracket plate

1	<b>Safety</b>	Read the safety section (1.2).
2	<b>Fit and mount parking bracket plate</b> 	<p>Fit the parking bracket plate (P1331, P1405 or P1805) to the tool attachment, using the guide pin, and mount with the two enclosed M6-screws. See tightening torques above.</p>
3	<b>Mount tool on tool attachment</b> 	<p>Mount the tool either from the tool attachment side or the tool side (section 2.2).</p>

## 2.4 Mounting of parking bracket kit

1	<b>Safety</b>	Read the safety section (1.2).
2	<b>Mount screws</b> 	Mount the four enclosed M8x12-screws on the two brackets. See tightening torques above.
3	<b>Fit and mount parking bracket plate</b> 	Fit the parking brackets (P1313) to the tool attachment and mount with the two enclosed M6-screws. See tightening torques above.
4	<b>Mount tool on tool attachment</b> 	Mount the tool either from the tool attachment side or the tool side (section 2.2).

## 3 MAINTENANCE AND SERVICE

The tool changer and tool attachment must be maintained regularly to ensure proper function. The specified intervals are approximate and valid under normal conditions, corresponding to 2 tool changes per minute during 2 work shifts per working day, i.e. 42.000 changes per month. Under extreme conditions, such as dirty environments or extreme robot movements, the intervals should be shortened. Consider the table as a guide and update as your production experience of each system increases.



### **WARNING!**

Risk of getting squeezed between piston and ball holder when the piston is taking closed position.



### **NOTE!**

Only perform work on grippers or tools attached to the tool changer if the air pressure is safely switched off.



### **NOTE!**

Tool changers must only be dismantled and repaired by Robot System Products during the warranty period. Otherwise the warranty will not be valid.

### 3.1 Maintenance scheme

#### 3.1.1 Every second week

The following maintenance activities should be carried out every second week.

Activity	Equipment		Description
Inspection	Tool changer	General	Visual inspection (section 3.2.1).
		Locking balls	Check locking balls (section 3.2.1).
		Air sealings	Check air sealings (section 3.2.1).
		Spring-loaded pins	Check spring-loaded signal pins (section 3.2.1).
	Tool attachment	General	Visual inspection (section 3.2.2).
Cleaning	Tool attachment	Signal contacts	Clean contact surfaces (section 3.2.2).

### 3.1.2 Every six-months or 250,000 tool changes

The following maintenance activities should be carried out every six-months or after every 250,000 tool changes, whichever comes first.

Activity	Equipment		Description
Cleaning and lubrication	Tool changer	Locking balls	Clean locking balls and add new lubrication, (section 3.2.3).
		Guide pins	Clean guide pins and add new lubrication (section 3.2.3).
		Air sealings	Clean sealings (section 3.2.3).
		Spring-loaded pins	Clean spring-loaded signal pins (section 3.2.3).
		Signal and servo power sockets	Clean around the sockets and add new lubrication (section 3.2.3).
		High voltage sockets	Clean around the sockets and add new lubrication (section 3.2.3).
	Tool attachment	Locking cavities	Wipe cavities of locking balls clean (section 3.2.4).
		Guide holes	Clean the holes for the guide pins and add new lubrication (section 3.2.4).
		Signal and servo power pins	Clean and servo power pins (section 3.2.4).
		High voltage pins	Clean high voltage pins (section 3.2.4).

### 3.1.3 To replace when damaged or worn-out





Equipment		Description
Tool changer	Air sealings	See section 4.3.1 or 4.3.2
	Guide pins	See section 4.3.3
	Spring-loaded signal pins	See section 4.3.4
	Signal interface	See section 4.3.5
	Servo power interface	See section 4.3.5
	High voltage interface	See section 4.3.5
	Air module	See section 4.3.5
Tool attachment	Signal interface	See section 4.3.6
	Servo power interface	See section 4.3.6
	High voltage interface	See section 4.3.6
	Air module	See section 4.3.6
	O-rings	See section 4.3.7



## 3.2 Specification of maintenance activities

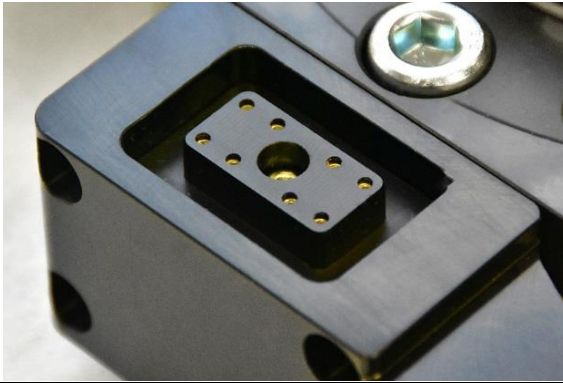
### 3.2.1 Visual inspection of tool changer

The following maintenance activities should be carried out on the TC every 2<sup>nd</sup> week.

Action	Note
<div data-bbox="196 510 300 611" data-label="Image"></div> <p><b>Check locking balls</b></p> 	<p>Check each ball to make sure it moves freely. For cleaning and lubrication of balls see section 3.2.3.</p> <p><b>NOTE!</b> If balls get stuck there is a risk that the tool attachment jams.</p>
<div data-bbox="196 1077 300 1178" data-label="Image"></div> <p><b>Check air sealings</b></p> 	<p>Check that the air sealings are clean. For cleaning see section 3.2.3.</p> <p>Check that the air sealings are not damaged. For making replacements see section 4.3.1 or 4.3.2.</p> <p><b>NOTE!</b> For tool changers and when air module, P1325, is used!</p>
<div data-bbox="196 1494 300 1594" data-label="Image"></div> <p><b>Check guide pins</b></p> 	<p>Check that the guide pins are greased. For cleaning and lubrication see section 3.2.3.</p> <p>Check that the guide pins are not worn-out or damaged. For making replacements see section 4.3.3.</p> <p><b>NOTE!</b> When option guide pins, P1314, is used!</p>
<div data-bbox="196 1933 300 2033" data-label="Image"></div> <p><b>Check spring-loaded signal pins</b></p> 	<p>Check that the spring-loaded signal pins are clean. For cleaning see section 3.2.3.</p> <p>Check that the spring-loaded signal pins are not worn-out or damaged. For making replacements see section 4.3.4.</p> <p><b>NOTE!</b> When interface options, P1305, P1311, P1338 and P1328, are used!</p>



#### Check servo power sockets



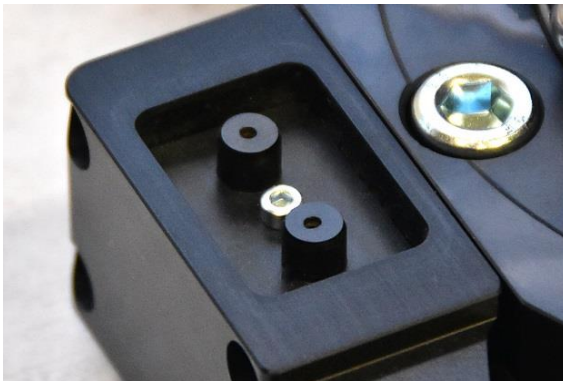
Check that the areas around the sockets are clean. For cleaning and lubrication see section 3.2.3.

Check that the sockets are not worn-out or damaged. For replacing the signal or servo power interface see section 4.3.5.

**NOTE!** When interface options, P1307, P1356, P1354 are used!



#### Check high voltage socket



Check that the area around the high voltage socket is clean. For cleaning and lubrication see section 3.2.3.

Check that the high voltage socket not is worn-out or damaged. For replacing the high voltage interface see section 4.3.5.

**NOTE!** When high voltage interface, P1322, is used!

#### Check cables


Check cables for damages and squeezing, replace if damaged.

#### Check tool changer in general

Check the tool changer for damages. For replacement see section 4.1.

### 3.2.2 Visual inspection and cleaning of tool attachment

The following maintenance activities should be carried out on the TA every 2<sup>nd</sup> week.

Action	Note
<b>Check holes for the guide pins</b> 	<p>Check that the guide pin holes are greased. For cleaning and lubrication see section 3.2.4.</p> <p>Check that the guide pin holes are not worn-out or damaged. For replacing the tool attachment see section 4.2.</p>





#### Check servo power pins



Check that the signal and servo power pins are clean. For cleaning and lubrication see section 3.2.4.

Check that the pins or interface are not worn-out or damaged. For replacing the signal or servo power interface see section 4.3.6.

**NOTE!** When interface options, P1308, P1357, P1355 are used!



#### Check high voltage pins



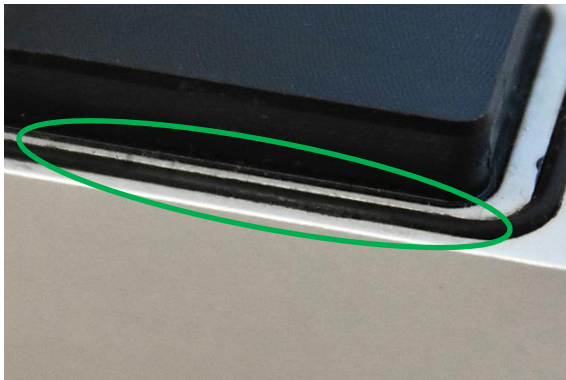
Check that the high voltage pins are clean. For cleaning and lubrication see section 3.2.4.

Check that the high voltage interface is not worn-out or damaged. For replacing the high voltage interface see section 4.3.6.

**NOTE!** When high voltage interface, P1323, is used!



#### Check O-rings

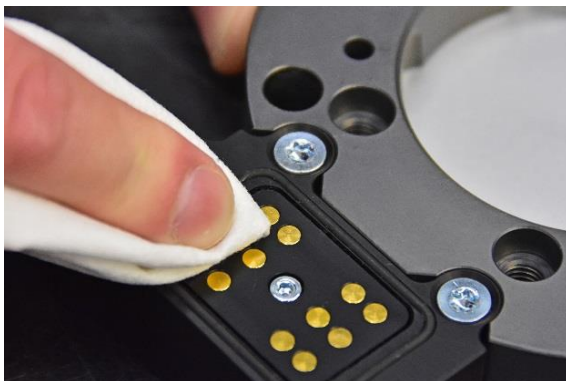


Check that O-rings on signal, power and high voltage modules are not worn-out or damaged. For making replacements see section 4.3.7.

**NOTE!** When interface options, P1306, P1312, P1308, P1339, P1329, P1323, P1357 and P1355 are used!



#### Clean surface of signal contact



Wipe the contact surface with a lint free cloth.

**NOTE!** When signal interface options, P1306, P1312, P1339 and P1329, are used!

Check that the signal interface is not worn-out or damaged. For replacing the signal interface see section 4.3.6.

#### Check cables




Check cables for damages and squeezing, replace if damaged.

#### Check tool attachment in general

Check the tool attachment for damages. For replacement see section 4.2.

### 3.2.3 Cleaning and lubrication of tool changer

The following maintenance activities should be carried out on the TC every 6<sup>th</sup> month or after 250,000 tool changes, whichever comes first.

Action	Note
<b>Clean locking balls</b> 	Check the locking balls and wipe them clean with a lint free cloth.
<b>Lubricate locking balls</b> 	Apply a small amount of grease (Renolit HLT2) on the locking balls.  <b>NOTE!</b> It is important that this is done or else there is a risk that the tool attachment jams.
<b>Clean guide pins</b> 	Wipe the guide pins with a lint free cloth.



#### Lubricate guide pins



Apply a small amount of grease (Renolit HLT2) on the guide pins.

#### Clean air sealings



Wipe air sealings clean with a lint free cloth.

#### Clean spring-loaded signal pins



Clean the contact surfaces of the spring-loaded signal pins with a nylon brush.

**NOTE!**

Signal pins shall be cleaned whenever blackened.

#### Clean servo power sockets



Wipe the areas around the signal and servo power sockets clean.

**NOTE!** It is important that this is done to preserve durability.





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**Lubricate signal and power sockets**

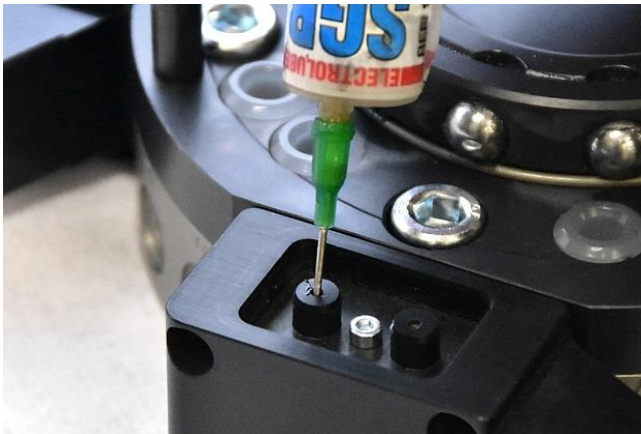
Apply a small amount of grease (Electrolube SGB) in each signal and servo power socket.

---

**Clean high voltage socket**

Wipe the area around the high voltage socket clean.

---



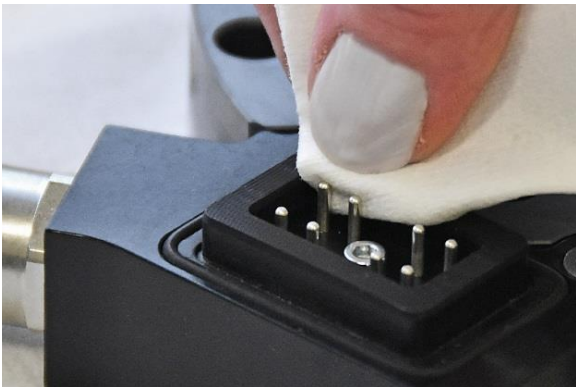

**Lubricate high voltage socket**

Apply a small amount of grease (Electrolube SGB) in the high voltage sockets.

### 3.2.4 Cleaning and lubrication of tool attachment

The following maintenance activities should be carried out on the TA every 6th month or after 250,000 tool changes, whichever comes first.

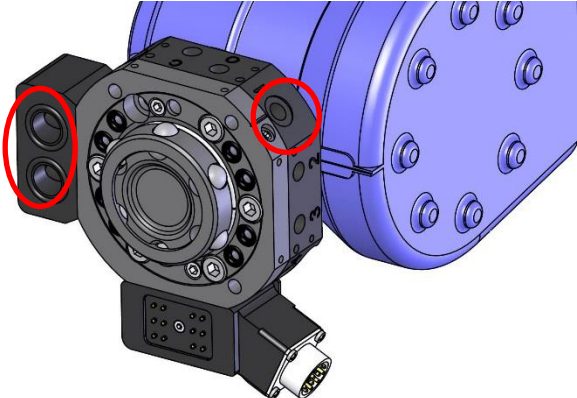
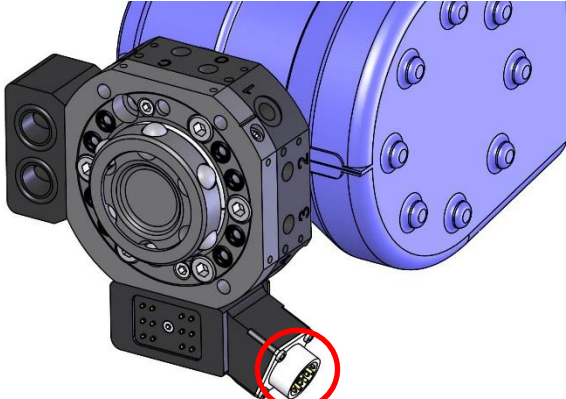


Action	Note
<b>Clean locking cavities</b> 	Clean the cavities of the locking balls.  <b>NOTE!</b> It is important that this is done or else there is a risk that the tool attachment jams.
<b>Clean and lubricate holes for the guide pins</b> 	Wipe clean and apply small amount of grease (Renolit HLT2) inside the guide pin holes.
<b>Clean servo power pins</b> 	Wipe clean the signal and servo power pins with a cotton swab.
<b>Clean high voltage pins</b> 	Wipe clean the high voltage pins with a cotton swab and the surface around the pins with a lint free cloth!

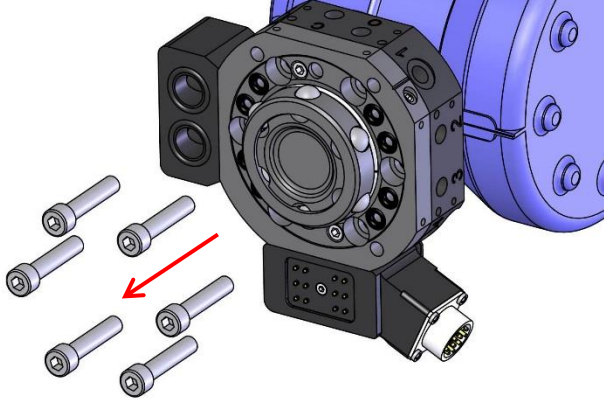
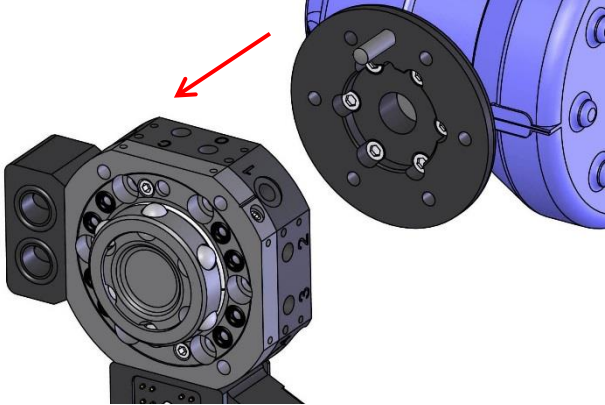
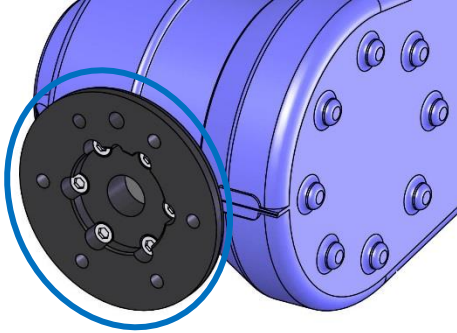
## 4 DISMOUNTING AND REPLACEMENT

### 4.1 Replacement of tool changer



	Action	Note
1	<b>Safety</b>	Read the safety section (1.2).
2	<b>Dismount tool</b>	Leave tool, with tool attachment mounted, in tool stand.
3	<b>Service position</b>	Place the robot in service position.  <b>NOTE!</b> The tool change function shall be in locked position.
4	<b>Power off</b>	Switch the power off and lock the circuit breaker.  <b>NOTE!</b> Read the safety chapter for the robot.
5	<b>Pneumatic air off</b>	Switch off pneumatic air.  <b>NOTE!</b> The pressure in the pneumatic system must be released before dismantling begins.
6	<b>Dismount hoses</b> 	Dismount the water/air hoses from the tool changer.  <b>NOTE!</b> Make sure that no dirt enters the air hoses.
7	<b>Release electric connections</b> 	Disconnect electric power and signals.  <b>NOTE!</b> Handle the contacts with care, as they are sensitive to mechanical damage. Make sure that no dirt enters the contacts.

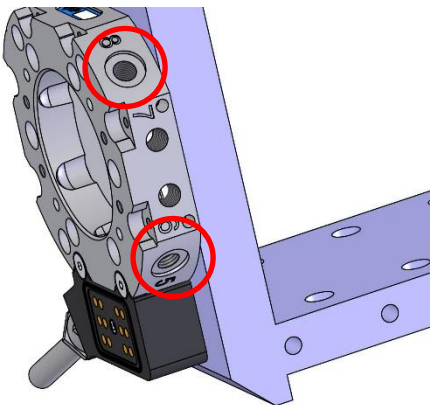
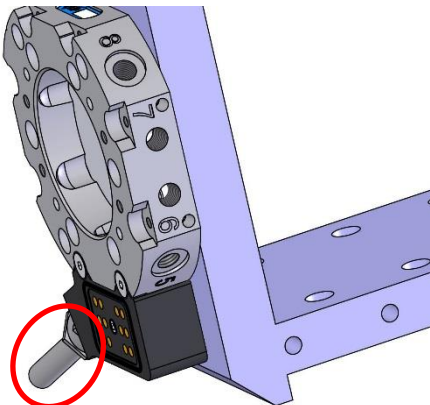
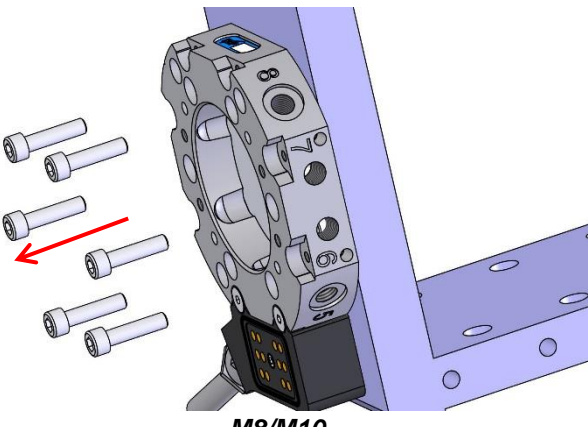


8	<b>Remove screws</b> 	Remove the screws holding the tool changer to the robot flange.  <b>WARNING!</b> The tool changer is heavy and may cause personal injury and equipment damage if dropped.
9	<b>Dismount tool changer</b> 	<b>NOTE!</b> Be careful not to damage the signal pins at the tool side of the tool changer.  <b>NOTE!</b> A guide pin is mounted between the tool changer and the robot flange.
10	<b>Cleaning</b> 	Clean the robot flange.
11	<b>Mount tool changer</b>	Follow instructions in section 2.1.



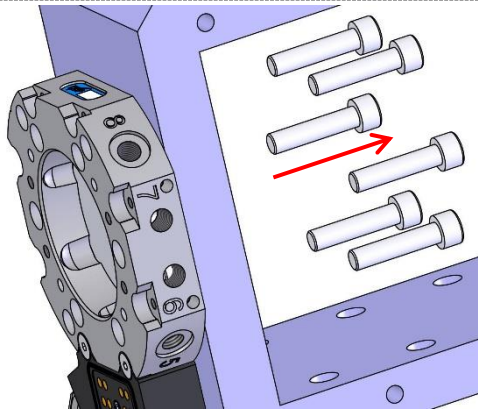
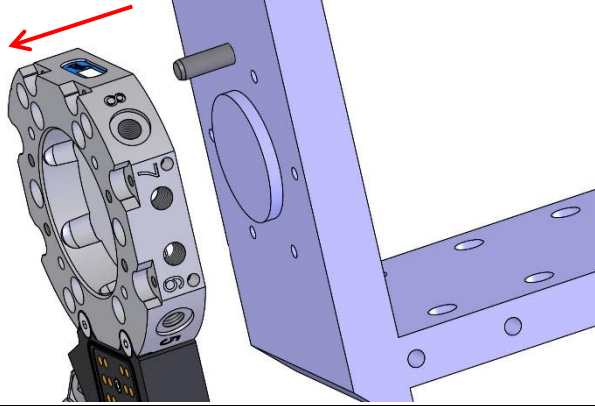
## 4.2 Replacement of tool attachment



	Action	Note
1	<b>Safety</b>	Read the safety section (1.2).
2	<b>Undock tool</b>	Place and undock tool attachment, with tool mounted, in a safe and fully supported position for dismantling.
3	<b>Dismount hoses</b> 	Dismount the water/air hoses from the tool attachment.  <b>NOTE!</b> Make sure that no dirt enters the water/air hoses.
4	<b>Release electric connections</b> 	Disconnect electric power and signals.  <b>NOTE!</b> Handle contacts with care, as they are sensitive to mechanical damage. Make sure that no dirt enters the contacts.
5	<b>Remove screws</b>  M8/M10	Remove the screws holding the tool attachment to the tool.  <b>NOTE!</b> The tool attachment can be fitted to the gripper/tool in two ways.  <b>WARNING!</b> The tool attachment is heavy and may cause personal injury and equipment damage if dropped.



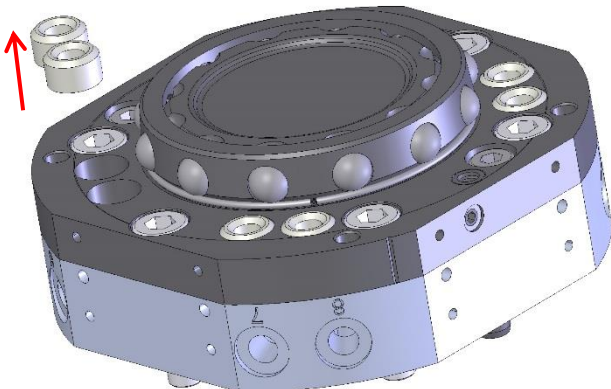
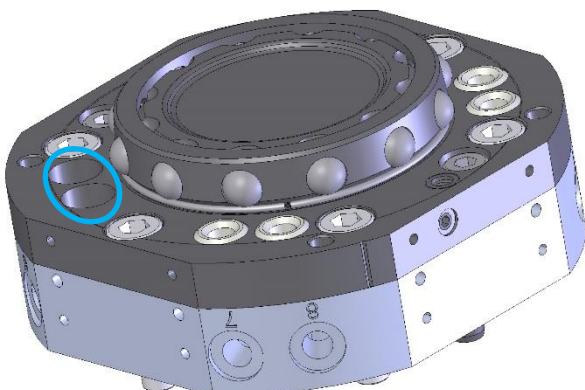
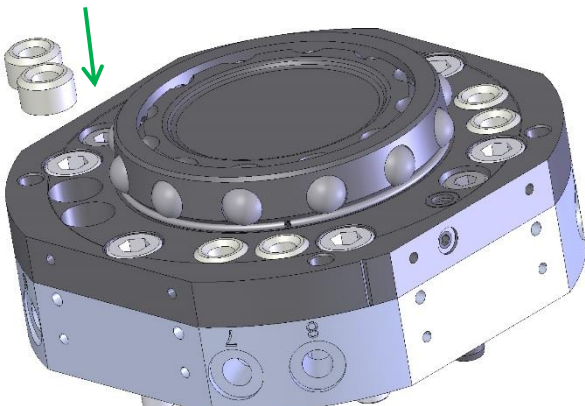


	 <p><b>M6/M8</b></p>	
6	<b>Dismount tool attachment</b> 	<b>NOTE!</b> A guide pin is mounted between the tool attachment and the tool.
7	<b>Clean the flange at the tool</b>	
8	<b>Mount tool attachment</b>	Follow instructions in section 2.2.

## 4.3 Replacement of wear parts




### 4.3.1 Replacement of air sealings on TC180



	Action	Note
1	<b>Remove air sealings</b> 	Remove the air sealings with a screw driver.  <b>NOTE!</b> There are totally 8 air sealings on the TC180.
2	<b>Clean sealing holes</b> 	Wipe clean the sealing holes. Remove all remaining parts of the sealings.
3	<b>Mount new air sealings</b> 	Tap in the air sealings with a plastic mallet.

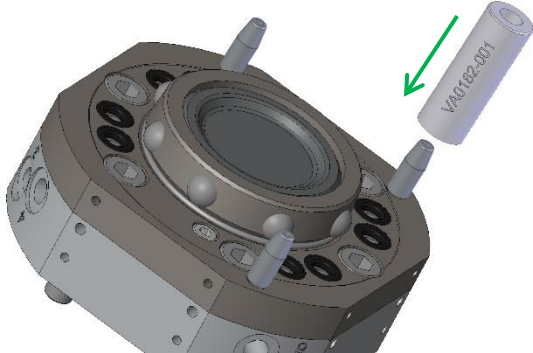

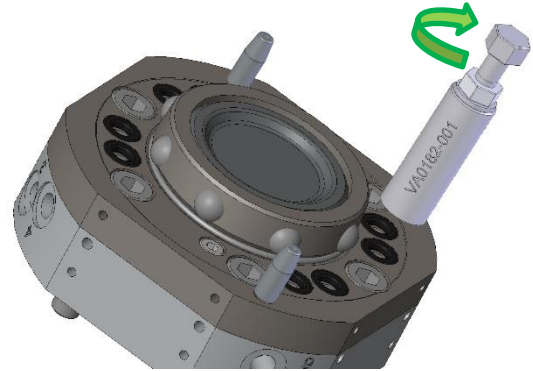
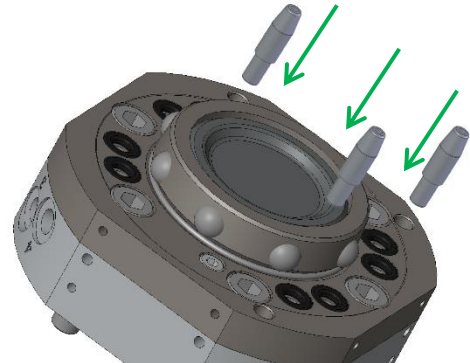
4.3.2 Replacement of air sealings on TC60, TC120 and air module, TC-side



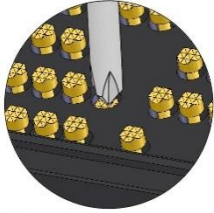
	Action	Note
1	<b>Remove air sealings</b> 	Remove the air sealings with a screw driver.  <b>NOTE!</b> There are totally 8 air sealings on TC60 and TC120 and two air sealings on the air module.
2	<b>Clean sealing holes</b> 	Wipe clean the sealing holes. Remove all remaining parts of sealings and glue.
3	<b>Mount new air sealings</b> 	Glue the new air sealings in the sealing grooves. Use a small amount of Loctite 480 (or similar). Press the sealings 60-120 seconds until the glue hardens.

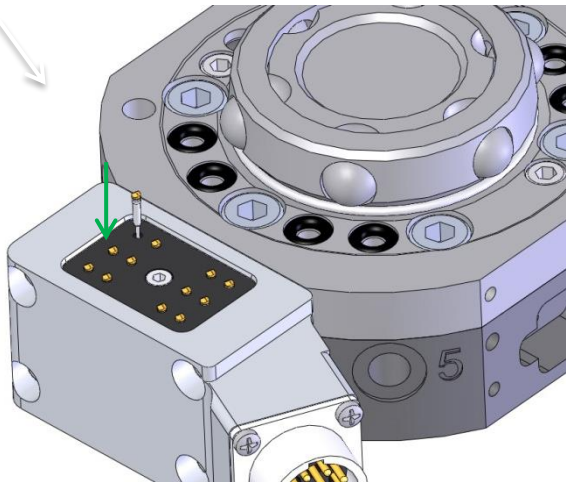
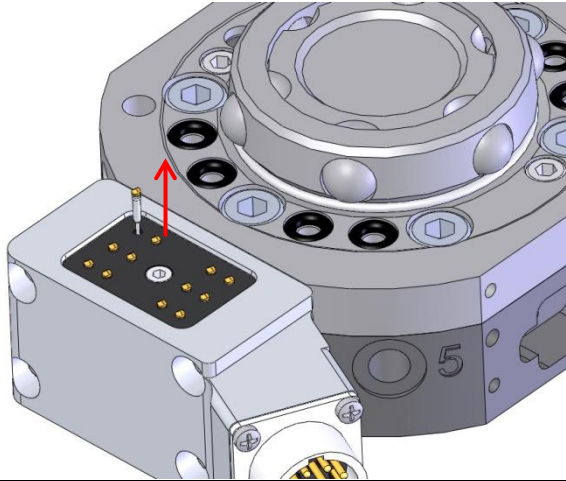
### 4.3.3 Replacement of guide pins (P1314) on tool changers



	Action	Note
1	<b>Mount puller housing</b> 	Enter the puller housing of the Guide pin puller (VA0182-001) over the guide pin.
2	<b>Mount puller screw</b> 	Enter the puller screw through the puller housing and guide pin. Fasten to the tool changer by screwing clockwise with a 13 mm spanner.  <b>NOTE!</b> Tightening torque max 3 Nm.
3	<b>Dismount guide pins</b> 	Pull out the guide pin by screwing the M8 nut clockwise with a 13 mm spanner.  <b>NOTE!</b> The puller screw shall be kept in position with a 13 mm spanner!
4	<b>Mount new guide pins</b> 	Apply Loctite 6300 on the guide pins and in the guide pin holes. Press the new guide pins into the tool changer.

### 4.3.4 Replacement of spring-loaded signal pins on signal interface, TC-side

	Action	Note
1	Switch power off	Switch the power off and lock the circuit breaker.
2	Remove signal pins	Pull out the signal pins with a pair of pliers.
3	Replace signal pins	Fit the new signal pins by pushing them into the sleeves.  <b>NOTE!</b> The signal pins must be individually pressed fully into the sleeves using a small screw driver! 
4	Switch power on	Unlock the circuit breaker and switch the power on.

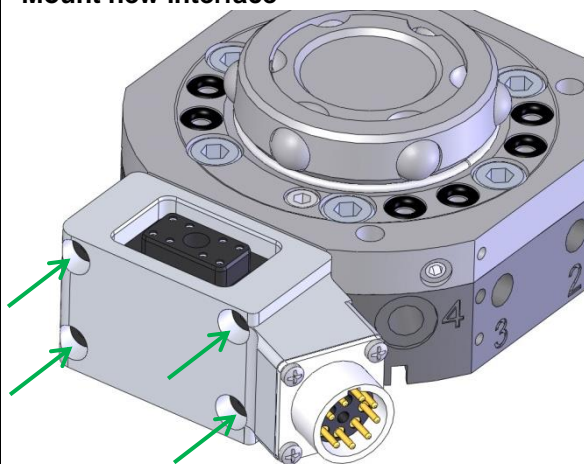
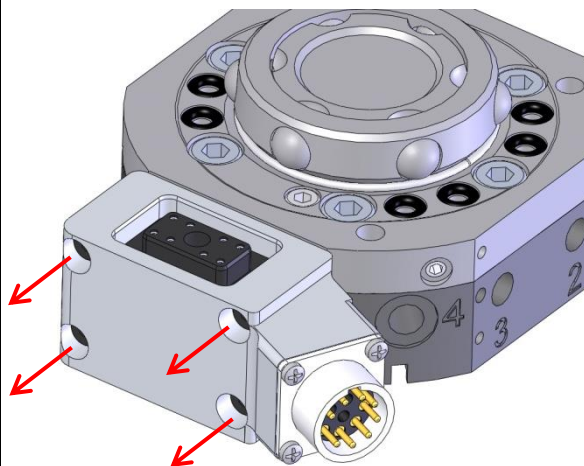




### 4.3.5 Replacement of signal, servo power, high voltage interface and air module, TC-side



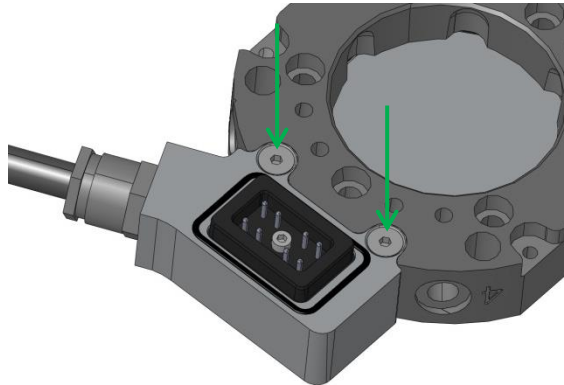
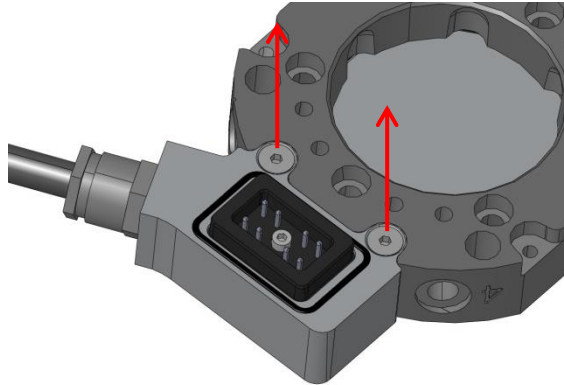
	Action	Note
1	Power off	Switch the power off and lock the circuit breaker.
2	Disconnect interface	Remove connector from the servo power interface.
3	Release interface	<p>Unscrew the four screws and release the signal interface/air module.</p> <p><b>NOTE!</b> P1307, P1322, P1356 and P1354 are mounted with a special type of shoulder screw. See spare part list.</p>
4	Mount new interface	<p>Mount a new signal interface/air module.</p> <p><b>NOTE!</b> Tightening torque for mounting of shoulder screws are 2 Nm. For standard M4 screws see tightening torques above.</p>
5	Reconnect interface	Connect the new signal interface/air module.



### 4.3.6 Replacement of signal interface/air module, TA-side

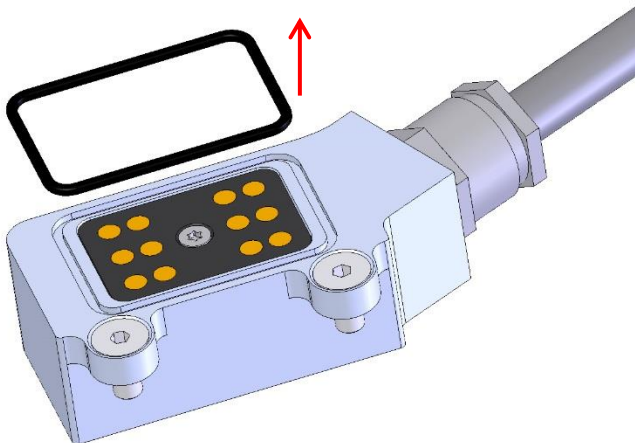
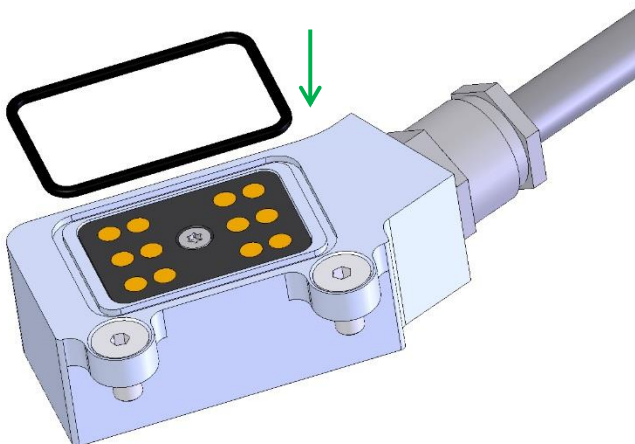


	Action	Note
1	Undock tool attachment	Undock tool attachment, switch power off and lock the circuit breaker.
2	Disconnect signals/air	Disconnect signals/air from the module.
3	Release interface	<p>Unscrew the four screws and release the signal interface/air module.</p> <p><b>NOTE!</b> Special types of screws are used. See spare part list in Technical Description.</p>
4	Mount new interface	<p>Mount a new signal interface/air module.</p> <p><b>NOTE!</b> Tightening torque for mounting 5 Nm.</p>
5	Reconnect interface	Connect the new signal interface/air module.



### 4.3.7 Replacement of O-rings on signal interface, TA-side

Replace O-rings when worn-out or damaged.

	Action	Note
1	<b>Remove O-rings</b> 	Remove the O-ring/O-rings on the tool attachments signal contact.
2	<b>Replace O-rings</b> 	Put small amount of grease (Renolit HLT2) on the new O-rings before they are mounted.



## **5 DISPOSAL AND RECYCLING**

### **Taking care of spent equipment**

Used equipment must be taken care of in an environmentally-friendly way.

When disposed of, a major share of the material, or its energy content, can be recycled. The quantities possible to recycle vary depending on technical resources and practises in respective country. Non-recyclable components shall be handed over to an authorized environmental waste treatment facility for destruction or disposal.

### **Electronics**

Electronic equipment shall be sent to an authorized recycling company or sorted into different component materials and treated as such.

### **Metals**

Metals can, in general, be melted down, recycled and used in new products. They shall be sorted according to type and surface coating and handed over to an authorized recycling facility.

Metal components of steel and aluminium are substantial in size and easy to identify. Copper and brass are primarily used in transmission of electric power and in water/air modules. Brass may include small alloy of lead. Silver or gold plating of contact surfaces may occur.

### **Plastics**

Thermoplastics can, in general, be re-heated and recycled without any major loss of quality. They shall be handed over to an authorized recycling facility. POM occurs in swivel housings, etc. PTFE in some sealings.

### **Rubber**

Rubber shall be handed over to an authorized environmental waste treatment facility either for recycling, disposal or destruction. Rubber occurs in O-rings.

### **Other material**

All other material shall be sorted and handed to an authorized environmental waste treatment facility in accordance with national legislation.





