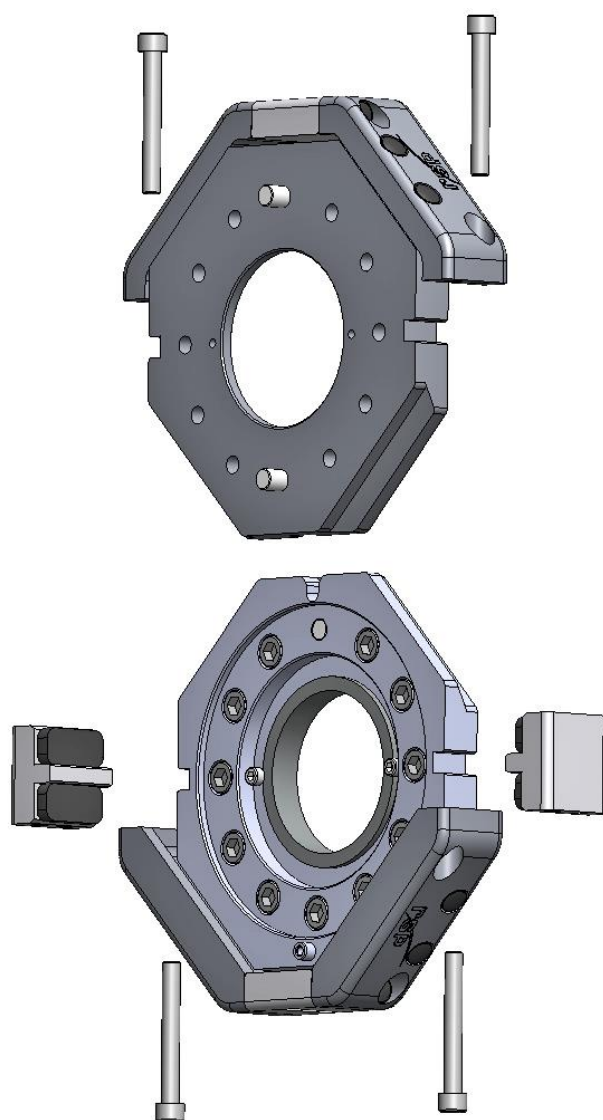


# Product Manual

## Manual quick tool changer MQC300

M0622-1

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





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# 1 INTRODUCTION

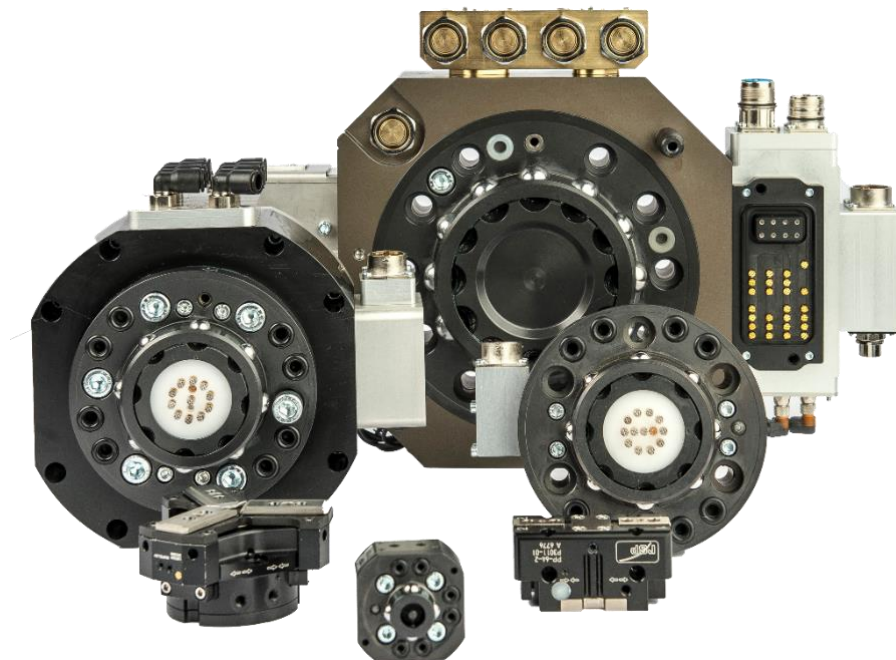
**Robot System Products** is a front-rank provider of peripheral products for high performance robot applications. We provide complete system solutions for your robot installations, aiming to improve your productivity with the most reliable and cost-effective tooling on the market. Continuously we explore 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: [www.rsp.eu.com](http://www.rsp.eu.com)



## 1.1 Safety

### 1.1.1 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 will 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 tools attached to the tool changer if the air pressure is safely switched off.



**WARNING!**

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



**WARNING!**

Electric signals and power must be disconnected/switched off during dismounting and mounting of tool changer and tools.

### 1.1.2 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.

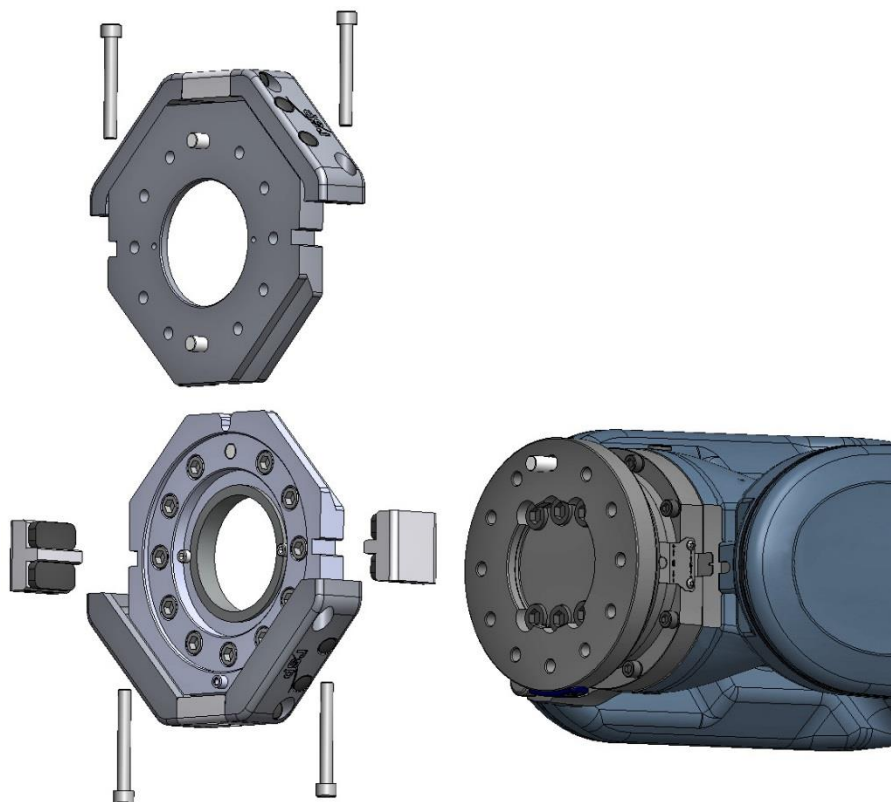
## 2 TECHNICAL SPECIFICATIONS

### 2.1 Description of MQC manual quick tool changers

This document presents the Robot System Products' MQC300 manual quick tool changers. RSP manual quick tool changers are designed to facilitate easy and quick mounting, dismounting and remounting of larger tools by hand. They have been optimized with respect to weight, compactness and robustness.

The MQC300 consists of two halves, an MQC master to be mounted on the robot side and MQC tool attachments to be mounted on the tools. When hanging in pick up position it will, even when unlocked, remain attached. This cost-efficient solution means that the signals and media are attached directly to the tool.

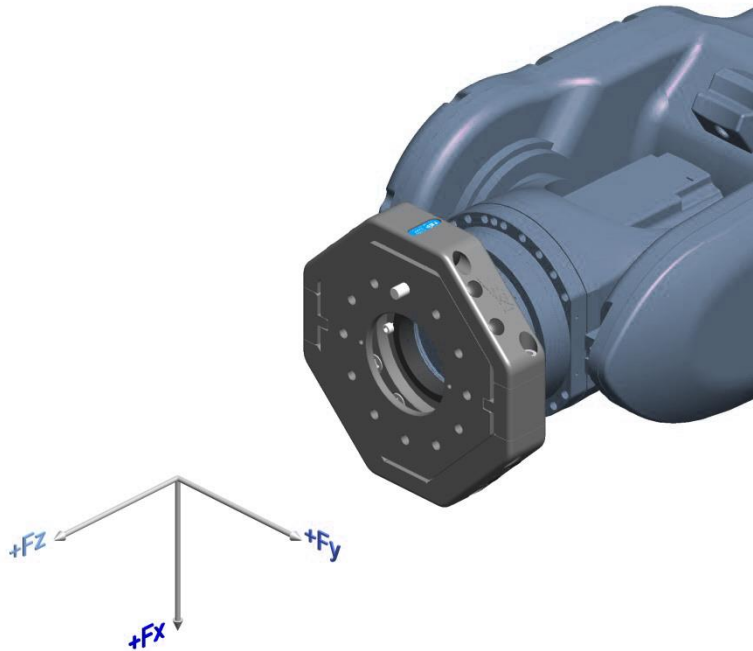
For other bolt circles adaptation plates between the tool changer and the turning disc of the robot or tool may be needed. Such adaptation plates are available from RSP.



**MQC300**

## 2.2 Coordinate System Definition

A tool changer adds load to the robot. If the arm and tool loads are not stated correctly during programming the behaviour of the robot and the wear of the equipment will be affected. Information about weight and centre of gravity can, in accordance with the co-ordinate system stated below, be found in the technical specification tables of the tool changers.

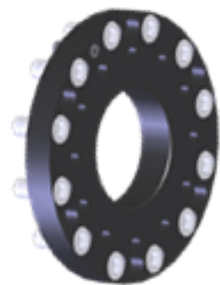


### NOTE!

For the MQC manual quick tool changers origo is situated on the surface in the centre of the robot mounting flange.

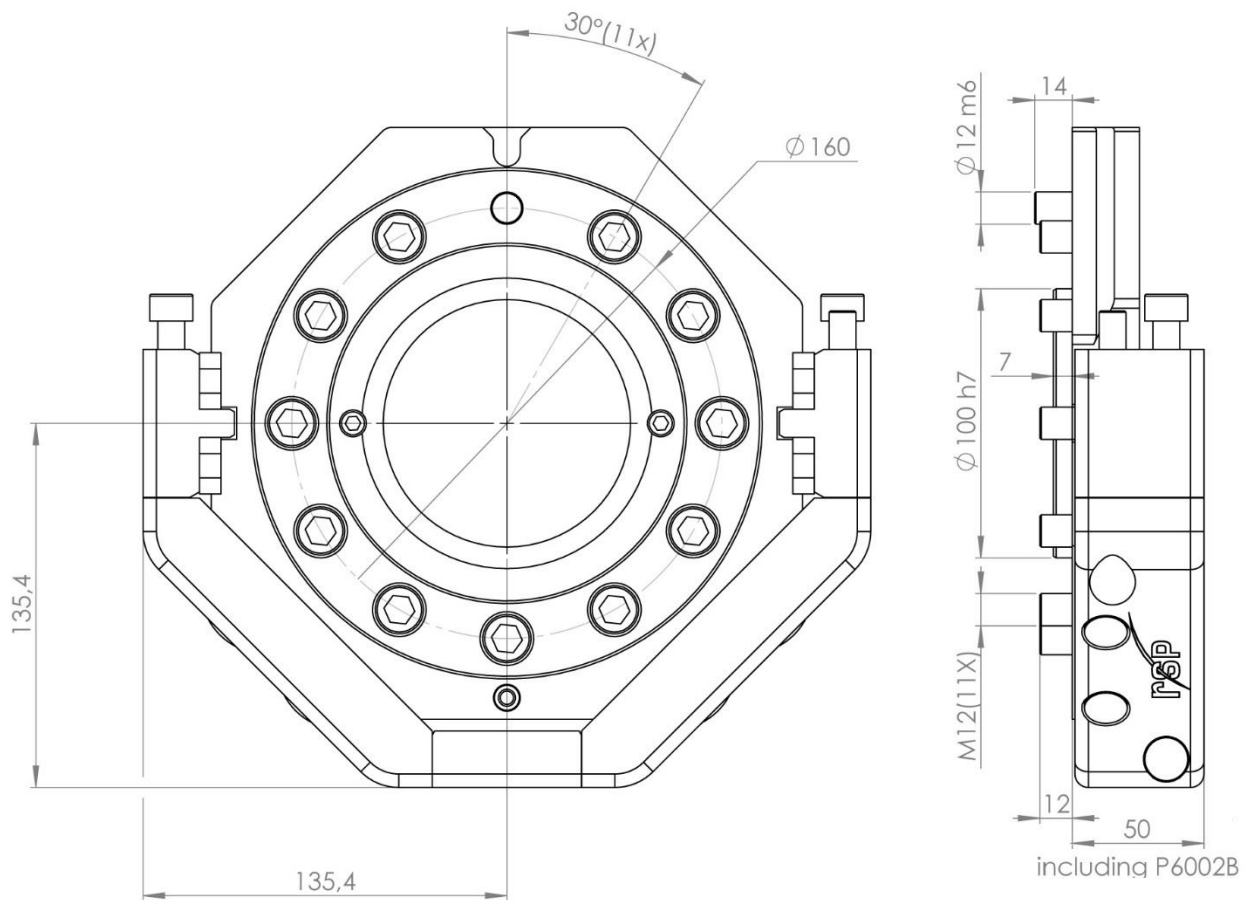
## 2.3 Robot adaptation plate

The flange of the tool changer shaft has fastening holes in accordance with ISO 9409-1. There are adaptation plates available for various bolt circles, they are mounted between the MQC manual quick tool changer and the robot flange. The order number is customer specific, depending on the robot.





### 2.3.1 Manual quick tool changer MQC300 master. Article no: P6001B

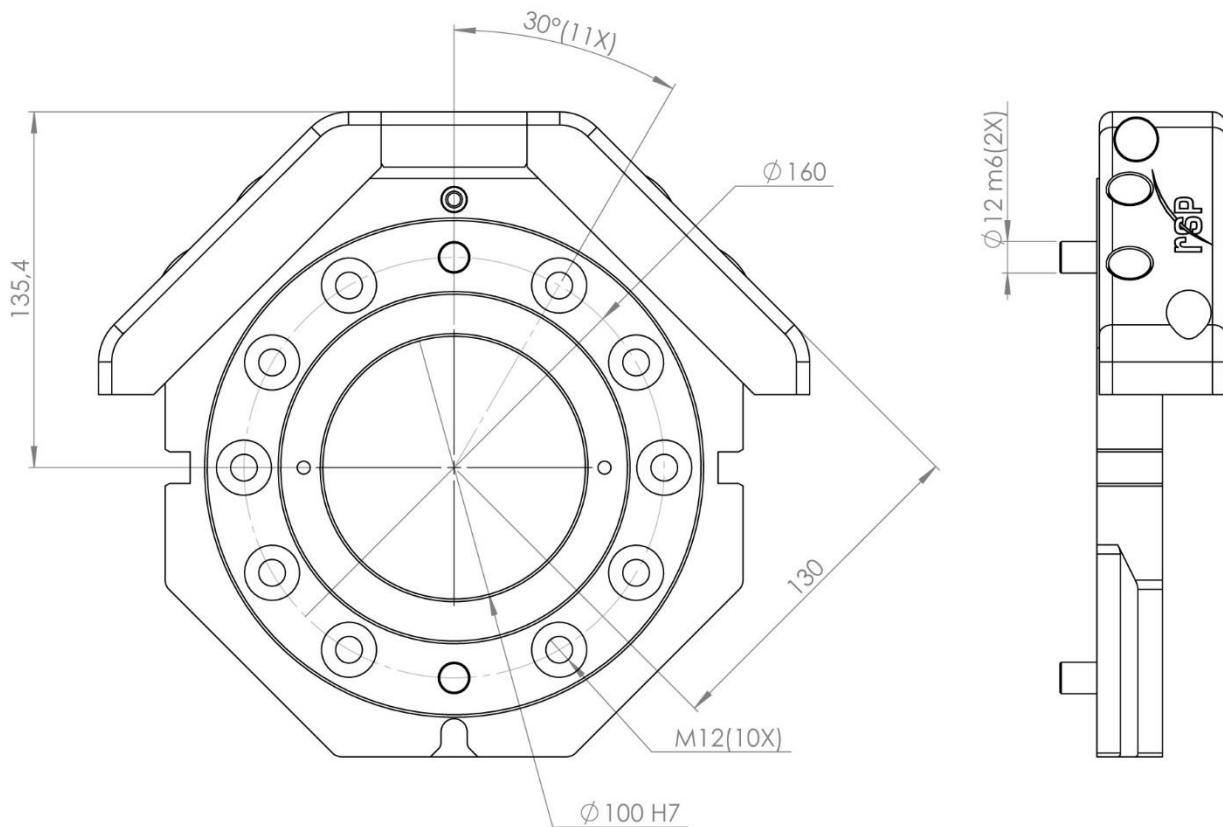


Manual quick tool changer MQC300 master P6001B, to be mounted on the robot side and combined with the MQC300 tool attachment P6002B mounted on the tool.

#### Technical data

<b>Working temperature</b>		10°C--+50°C
<b>Bolt pattern</b>		ISO 9409-1 160-11-M12
<b>Weight</b>		7,9 kg
<b>Maximum tool load</b>	Fz (static)	±5 000 N
	Mx/My (dynamic)	±5 000 Nm
	Mz (dynamic)	±3 000 Nm

### 2.3.2 Manual tool attachment MQC300. Article no: P6002B



MQC300 tool attachment P6002B, to be mounted on the tool and combined with MQC master P6001B on the robot side.

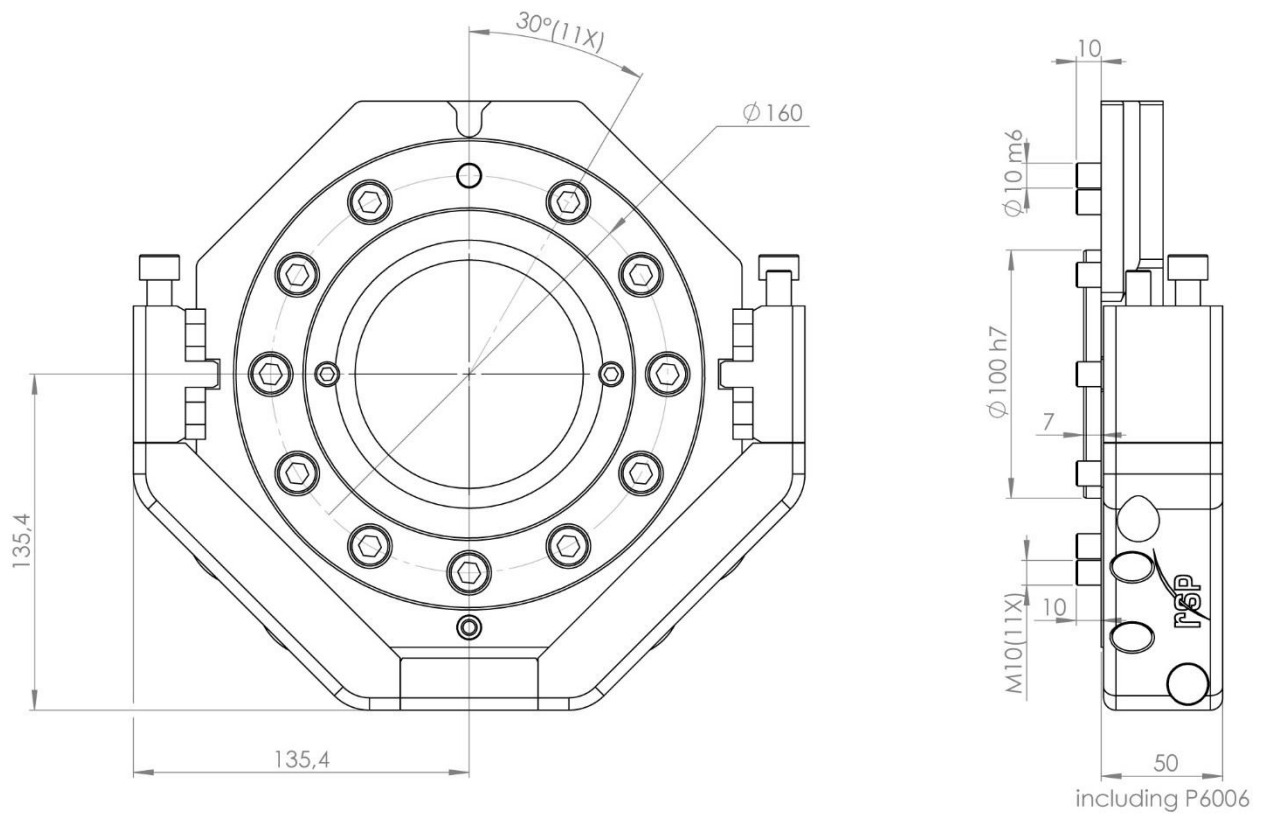
#### Technical data

<b>Working temperature</b>		10°C–+50°C
<b>Bolt pattern</b>		ISO 9409-1 160-10-M12
<b>Weight</b>		6,9 kg
<b>Maximum tool load</b> (M12-screws)	Fz (static)	±5 000 N
	Mx/My (dynamic)	±5 000 Nm
	Mz (dynamic)	±3 000 Nm
<b>Maximum tool load</b> (M10-screws)	Fz (static)	±5 000 N
	Mx/My (dynamic)	±5 000 Nm
	Mz (dynamic)	±2 500 Nm



**Note!** Tools can be mounted to the MQC tool attachment P6002B using ten M12-screws, alternatively the MQC300 tool attachment P6002B can be mounted to the tool using ten M10-screws.

### 2.3.3 Manual quick tool changer MQC300 master. Article no: P6005

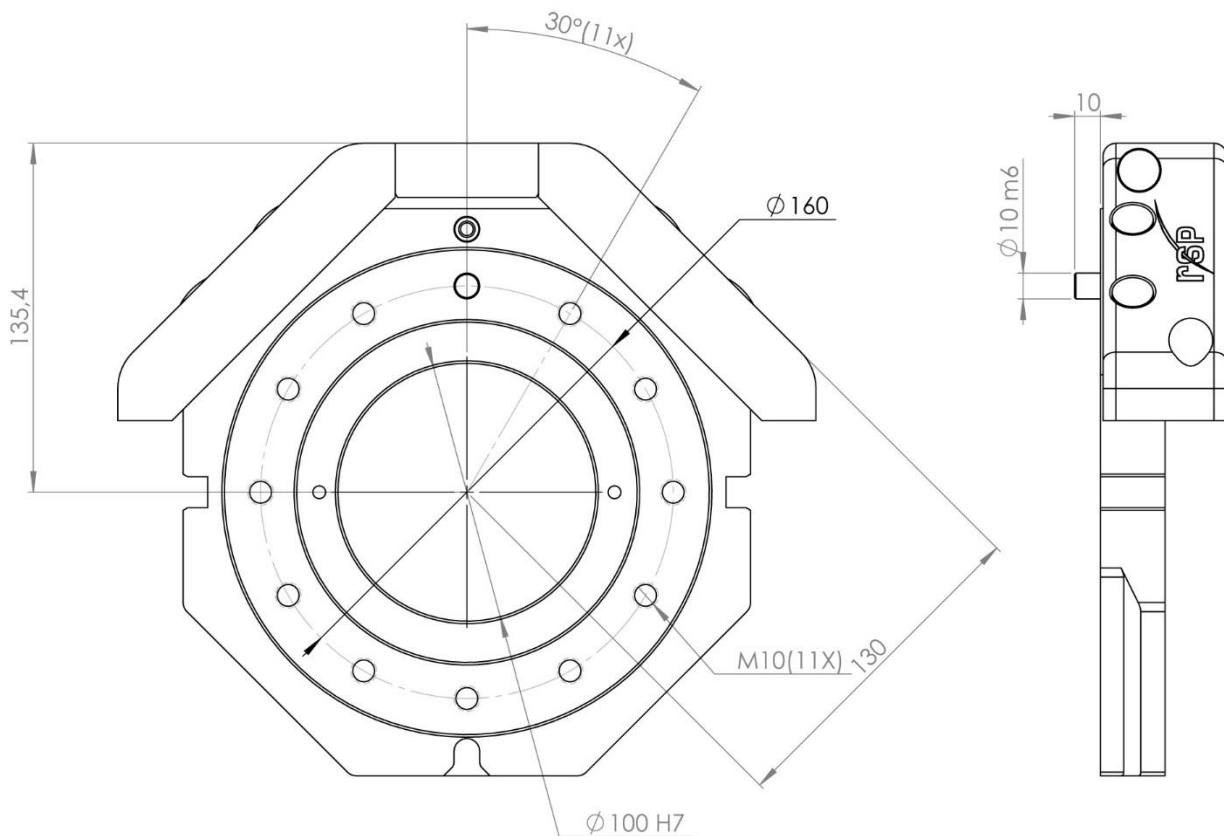


Manual quick tool changer MQC300 master P6005, to be mounted on the robot side and combined with the MQC300 tool attachment P6006 mounted on the tool.

#### Technical data

<b>Working temperature</b>		10°C--+50°C
<b>Bolt pattern</b>		ISO 9409-1 160-11-M10
<b>Weight</b>		7,9 kg
<b>Maximum tool load</b> (M10-screws)	Fz (static)	±5 000 N
	Mx/My (dynamic)	±5 000 Nm
	Mz (dynamic)	±2 500 Nm

### 2.3.4 Manual tool attachment MQC300. Article no: P6006



MQC300 tool attachment P6006, to be mounted on the tool and combined with MQC300 master P6005 on the robot side.

#### Technical data

<b>Working temperature</b>		10°C–+50°C
<b>Bolt pattern</b>		ISO 9409-1 160-11-M10
<b>Weight</b>		7,0 kg
<b>Maximum tool load</b> (M10-screws)	Fz (static)	±5 000 N
	Mx/My (dynamic)	±5 000 Nm
	Mz (dynamic)	±2 500 Nm
<b>Maximum tool load</b> (M8-screws)	Fz (static)	±3 000 N
	Mx/My (dynamic)	±3 000 Nm
	Mz (dynamic)	±1 500 Nm



**Note!** Tools can be mounted to the MQC tool attachment P6006 using ten M10-screws, alternatively the MQC tool attachment P6006 can be mounted to the tool using ten M8-screws.

## 3 INSTALLATION

### 3.1 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

### 3.2 Recommended tools for installation

Tools	Applications
Complete set of Allen keys	For dismounting and mounting.
Torque wrench	For all socket head cap screws

### 3.3 Mounting of MQC master (P6001B and P6005) on robot side



	Action	Note
1	<b>Safety</b>	Read the safety section (1.1).
2	<b>Service position</b>	Place the robot in service position.
3	<b>Pneumatic air off</b>	<b>NOTE!</b> The pressure in the pneumatic system must be released before dismounting.
4	<b>Mount guide pin</b>	<p>Press the enclosed guide pin into the robot flange. <i>Alternatively, if adaptation plate is used:</i></p> <p>Mount the adaptation plate on the robot flange (see tightening torques above). Press the enclosed guide pin into the adaptation plate.</p>
5	<b>Fit MQC master to robot</b>	<p>Lift the MQC master to the robot flange (or adaptation plate). Make sure that the guide pin is fitted to the guide hole in the tool changer.</p> <p><b>WARNING!</b> MQC master may cause personal injury and equipment damage if dropped.</p>
6	<b>Mount master to robot</b>	Mount the MQC master with the enclosed screws. Use an Allen key for tightening (see tightening torques above).

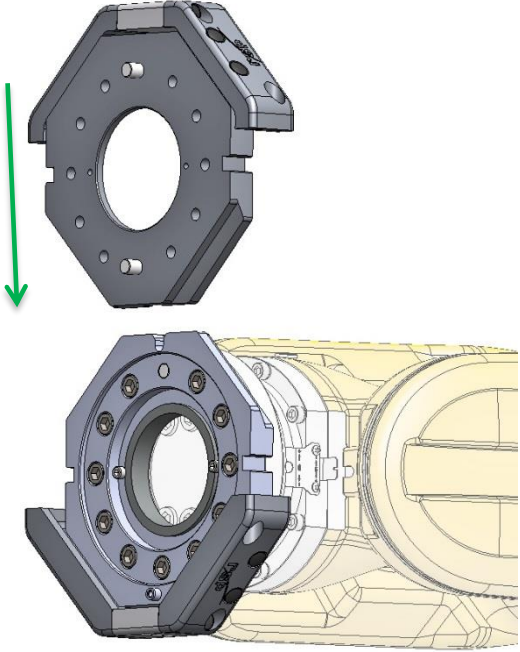
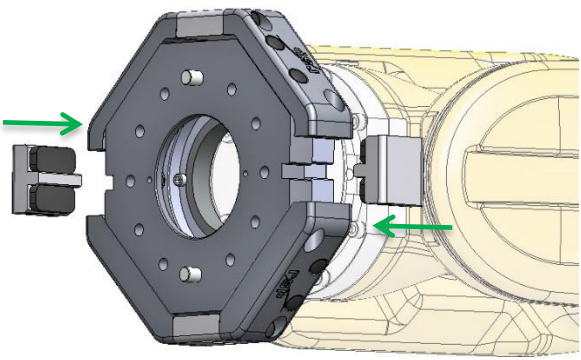


### 3.4 Mounting of MQC tool attachment (P6002B and P6006)

	Action	Note
1	<b>Safety</b>	Read the safety section (1.1).
2	<b>Mount guide pin(s)</b>	Press a guide pin (MQC P6006) or alternatively two guide pins (MQC P6002B) into the corresponding hole(s) on the tool.
3	<b>Fit tool attachment</b>	Lift and fit the tool attachment, using the guide pin(s), into its appropriate guide hole(s).
4	<b>Mount tool attachment</b>	<p>The tool attachment can be mounted in two alternative ways:</p> <ul style="list-style-type: none"> <li>○ Screws are put in from the gripper/tool side to the threaded holes in the tool attachment. See tightening torques above.</li> </ul> <hr/> <ul style="list-style-type: none"> <li>○ Screws are put in from the tool attachment side to threaded holes in the gripper/tool. See tightening torques above.</li> </ul>

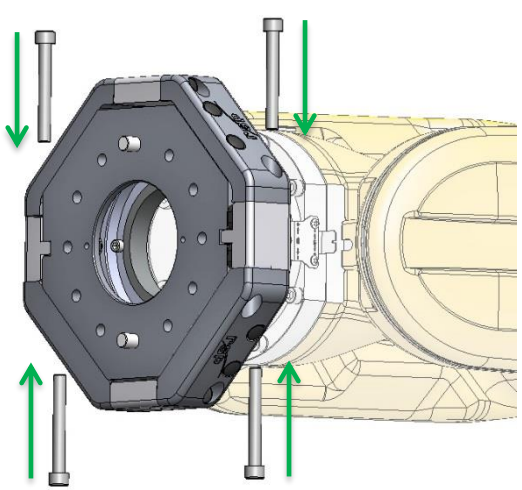




### 3.5 Mounting of MQC tool attachment on MQC master



	Action	Note
1	<b>Safety</b>	Read the safety section (1.1).
2	<b>Clean and lubricate</b>	Clean the surfaces on MQC tool attachment and MQC master and apply a small amount of grease (Molykote BR2Plus).
3	<b>Fit MQC tool attachment</b> 	Fit the MQC tool attachment onto the MQC master.  <b>NOTE!</b> The robot flange shall normally be in vertical position, with the guiding bar of the MQC master downwards, before the MQC tool attachment is fitted.
4	<b>Fit locking pieces</b> 	Fit the two locking pieces between the MQC tool attachment and the MQC master.  <b>NOTE!</b> Although the MQC tool attachment will hang by its own weight the mounting must be fully finished before the robot is allowed to move.





<p>5</p>	<p><b>Attach screws</b></p> 	<p>Attach the four screws holding the MQC tool attachment and the MQC master together.</p>
<p>6</p>	<p><b>Tighten crosswise – step 1</b></p>  <p><b>Tighten crosswise – step 2</b></p>  <p><b>Tighten crosswise – step 3</b></p>  <p><b>Tighten crosswise – step 4</b></p> 	<p>Tighten the M10 screws crosswise. Tightening torque shall be 47 Nm when finished.</p>

## 4 MAINTENANCE AND SERVICE

### 4.1 Maintenance

The MQC manual quick tool changer requires a minimum of maintenance to ensure the proper function.



**NOTE!**

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



**NOTE!**

The MQC manual quick tool changer must only be dismantled and repaired by Robot System Products during the warranty period. Otherwise the warranty will not be valid.

#### 4.1.1 Required products

Product	Specification	Note
Cleaning agent	Industrial alcohol or similar	For MQC master and MQC tool attachment.
Grease I0876	Molykote BR2Plus	For contact surfaces of MQC master and MQC tool attachment.
Cloth	Lint free cloth	For cleaning.



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

#### 4.1.2 Recommended tools for maintenance

Tools	Applications
Complete set of Allen keys	For dismounting and mounting.
Torque wrench	For all socket head cap screws

#### 4.1.3 Activities and intervals

For MQC tool attachment and MQC master no preventive maintenance is required.

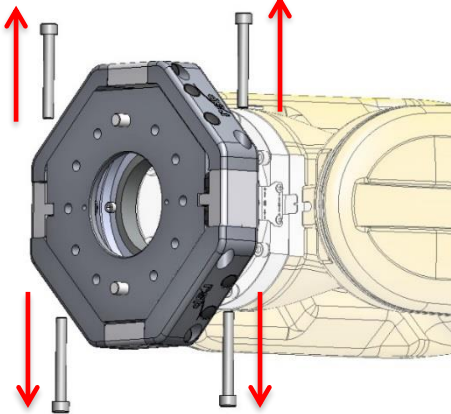
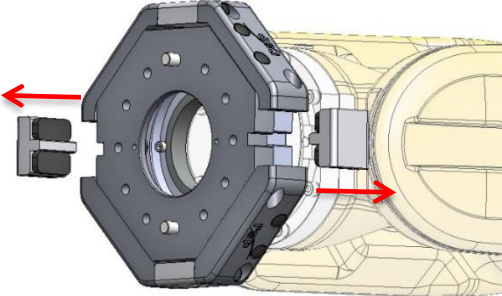
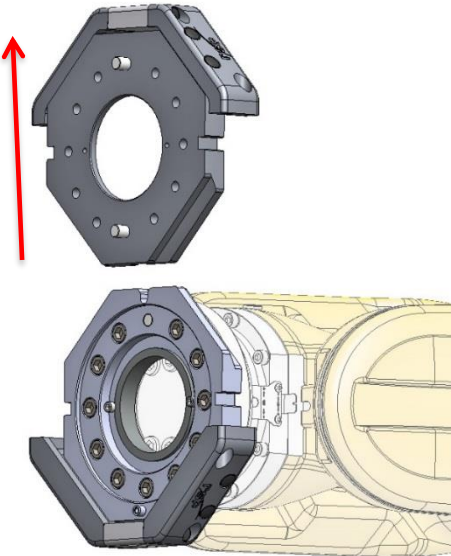


**NOTE!**

Every time the MQC tool attachment and MQC master is remounted after being dismantled the contact surfaces should be cleaned and lubricated.

## 4.2 Dismounting of MQC tool attachment from MQC master

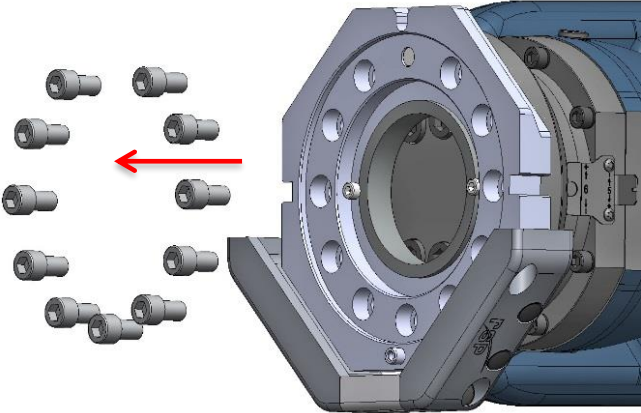
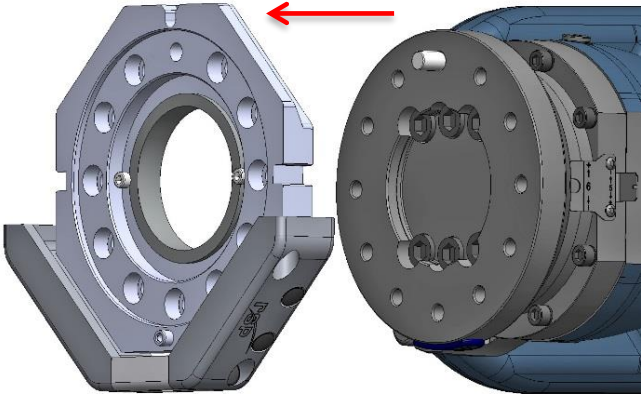
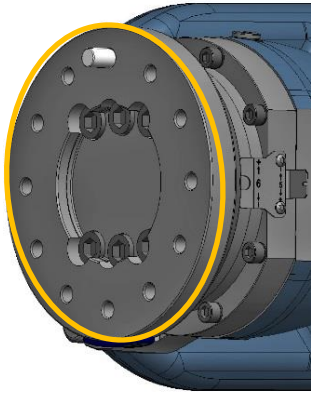


	Action	Note
1	<b>Safety</b>	Read the safety section (1.1).
2	<b>Service position</b>	Place the robot in service position. <b>NOTE!</b> The robot flange shall normally be in vertical position, with the guiding bar of the MQC master downwards, before dismounting.
3	<b>Pneumatic air off</b>	<b>NOTE!</b> The pressure in the pneumatic system must be released before dismounting.
4	<b>Remove screws</b> 	Remove the four screws holding the MQC tool attachment and the MQC master together.
5	<b>Remove locking pieces</b> 	Remove the two locking pieces between the MQC tool attachment and the MQC master.  <b>NOTE!</b> The MQC tool attachment will hang by its own weight provided the guiding bar of the MQC master is in downwards position.
6	<b>Dismount MQC tool attachment</b> 	Dismount the MQC tool attachment from the MQC master.  <b>WARNING!</b> The MQC tool attachment with tool mounted is heavy and may cause damage if dropped.



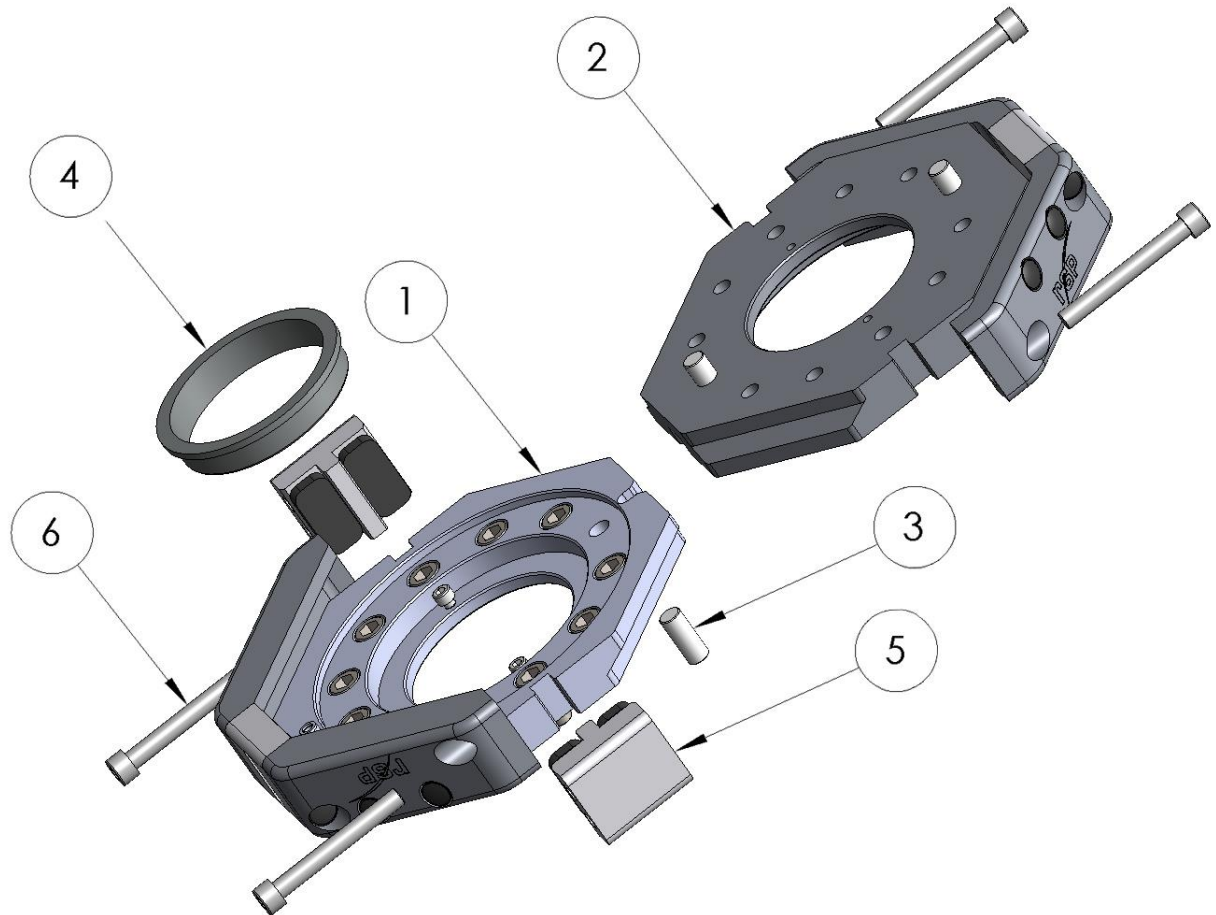
### 4.3 Dismounting of MQC master



	Action	Note
1	<b>Safety</b>	Read the safety section (1.1).
2	<b>Service position</b>	Place the robot in service position.
3	<b>Pneumatic air off</b>	<b>NOTE!</b> The pressure in the pneumatic system must be released before dismounting.
4	<b>Remove screws</b> 	Remove the screws holding the MQC master to the robot flange.  <b>WARNING!</b> The MQC master is heavy and may cause damage if dropped.
5	<b>Dismount MQC master</b> 	<b>NOTE!</b> A guide pin is mounted between the MQC master and the robot flange.
6	<b>Clean the robot flange</b> 	Wipe the robot flange clean with a lint free cloth.

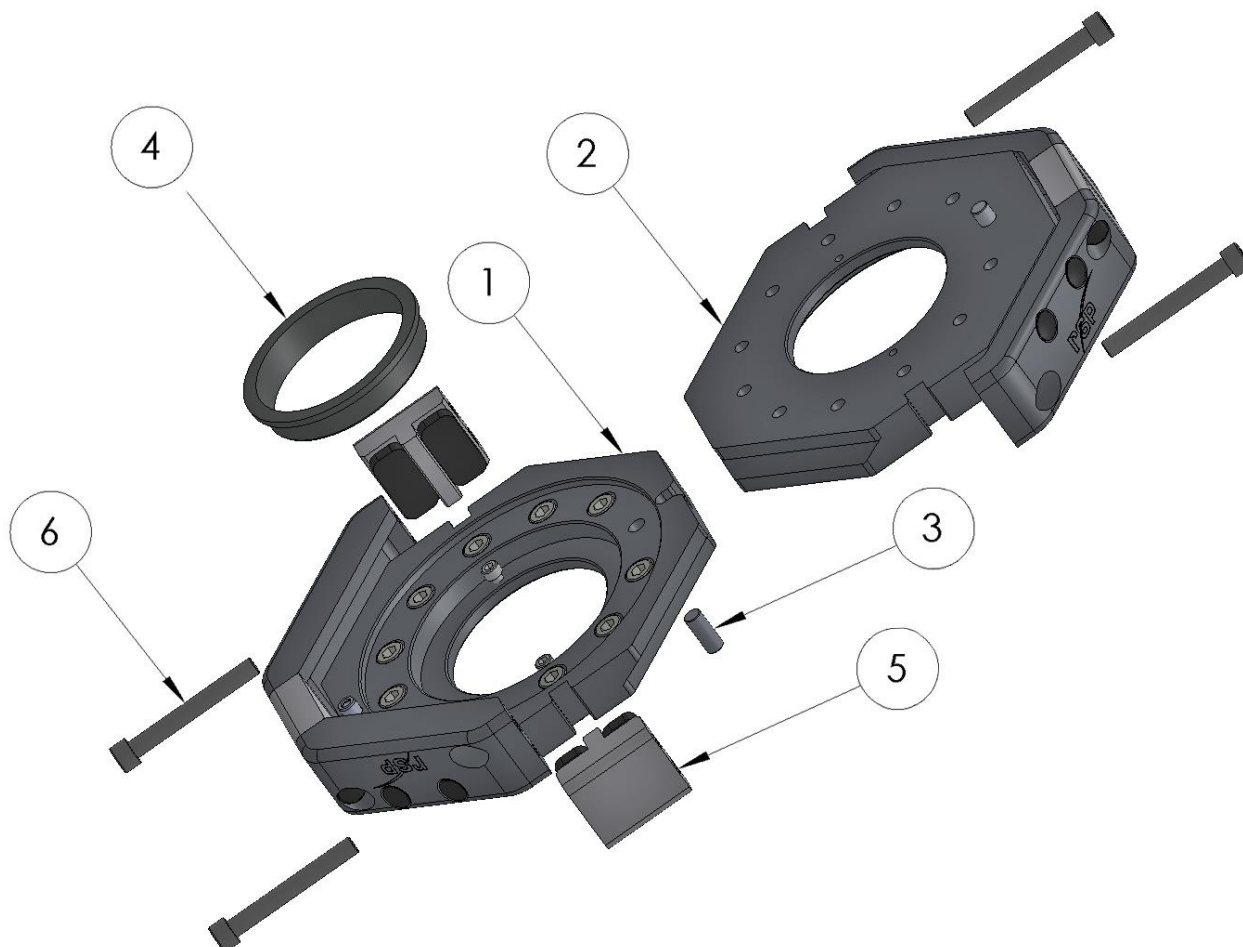
## 5 SPARE PARTS

### 5.1 Part list for MQC300, P6001B and P6002B



Item	Description	Part number	Wear part	Pcs
1	MQC master	P6001B		1
2	MQC tool attachment	P6002B		1
3	Guide pin	21112021-512		1
4	Guide ring	P0246-009		1
5	Locking clamp with damper	A0246-024		2
6	Screw	MC6S M10x80		4

## 5.2 Part list for MQC300, P6005 and P6006



Item	Description	Part number	Wear part	Pcs
1	MQC master	P6005		1
2	MQC tool attachment	P6006		1
3	Guide pin	CPK 10x25		1
4	Guide ring	P0246-009		1
5	Locking clamp with damper	A0246-024		2
6	Screw	MC6S M10x80		4

## **6 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.







