UNIVERSAL ROBOTS



Service Manual

Revision 4.0.0

Compatible robots: UR3e, UR5e, UR10e, UR16e

Control Box: e-Series Control box, OEM Control Box
Original instructions (en)

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1. Introduction

1.1. About This Document

The purpose of the Service Manual is to help Universal Robots (UR) users and integrators to safely perform service-related operations and troubleshooting.

Universal Robots industrial robots are designed using high quality components to ensure a long lifetime. However, improper use of a robot or robot parts can potentially cause failures. If, for example, the robot is overloaded, dropped during relocation, damaged by collision, or any other improper usage, the warranty will be void.

Universal Robots recommends the user does not attempt repair, adjustment, or make other interventions in the mechanical or electrical systems of the robot without first consulting a UR certified service engineer. Any unauthorized intervention voids the warranty. Service-related operations and troubleshooting should only be performed by qualified personnel.

Before performing service-related operations, stop the robot program and disconnect the main power to any potential dangerous tool on the robot or in the surroundings.

In the event of a defect, Universal Robots recommends ordering new parts from the Universal

Robot distributor where the robot was originally purchased. Alternatively, parts can be ordered from the nearest distributor, details of which can be obtained from Universal Robots official website at www.universal-robots.com

1.2. Company Details

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1.4. Safety Message Types

Safety messages in this document contain information that helps you avoid injuries or equipment damage. This document contains the following safety message types.

DANGER, WARNING, CAUTION, NOTICE and SAFETY INSTRUCTION statements are used throughout this manual to emphasize important and critical information.
You MUST read these statements to help ensure safety and to prevent product damage.

The statements are defined below.



DANGER

These warnings mean a hazardous situation which, if not avoided, will result in death or serious injury.



WARNING

These warnings mean a hazardous situation which, if not avoided, could result in death or serious injury.



CAUTION

These warnings mean a hazardous situation which, if not avoided, could result in minor or moderate injury.



NOTICE

These warnings mean damage to property may occur if no precautions are taken.



CAUTION

This warning sign contain references to safety-relevant information or general safety measures.
This warning sign do not refer to individual hazards or individual precautionary measures.

This warning draws attention to procedures which serve to prevent or remedy emergencies or malfunctions:

MANDATORY ACTION

Procedures marked with this warning must be followed exactly.

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2. Handling ESD-Sensitive Parts

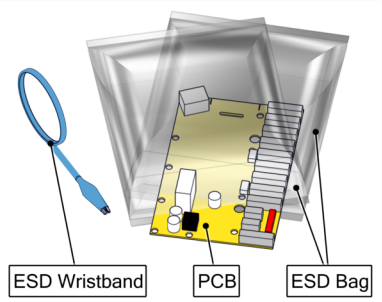




To prevent damage to ESD-sensitive parts i.e. Printed Circuit Board, follow the instructions below in addition to all the usual precautions, such as turning off the power before removing the circuit boards. See section Complete Rebooting Sequence

NOTICE

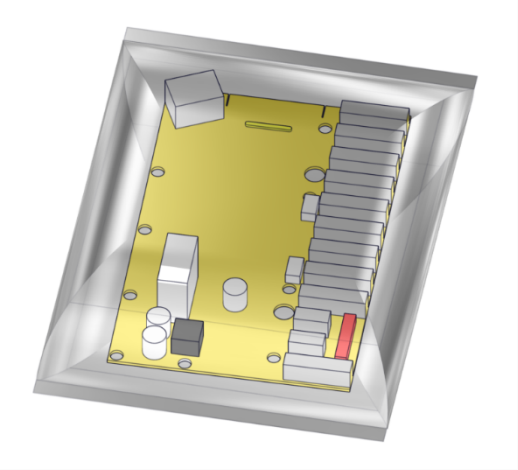
Be sure you have intact ESD Wristband and a spare ESD bag before replacing any ESD-sensitive parts.



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NOTICE

Keep the ESD-sensitive part in its original shipping container (a special "ESD bag") until the part is ready to be installed.

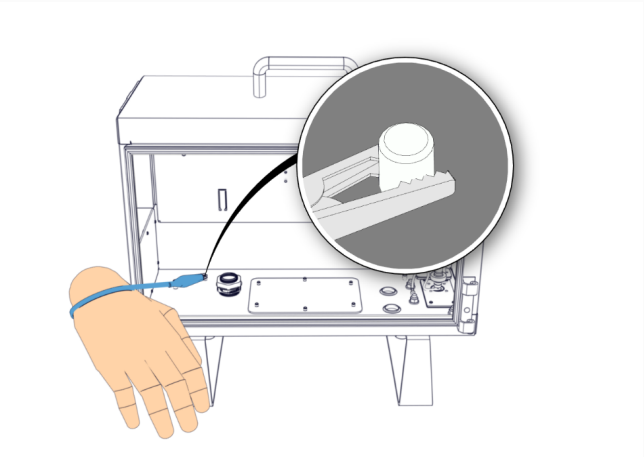


NOTICE

Put the ESD wristband on your wrist. Connect the wristband to the system ground point.
It discharges any static electricity in your body to ground.

NOTICE

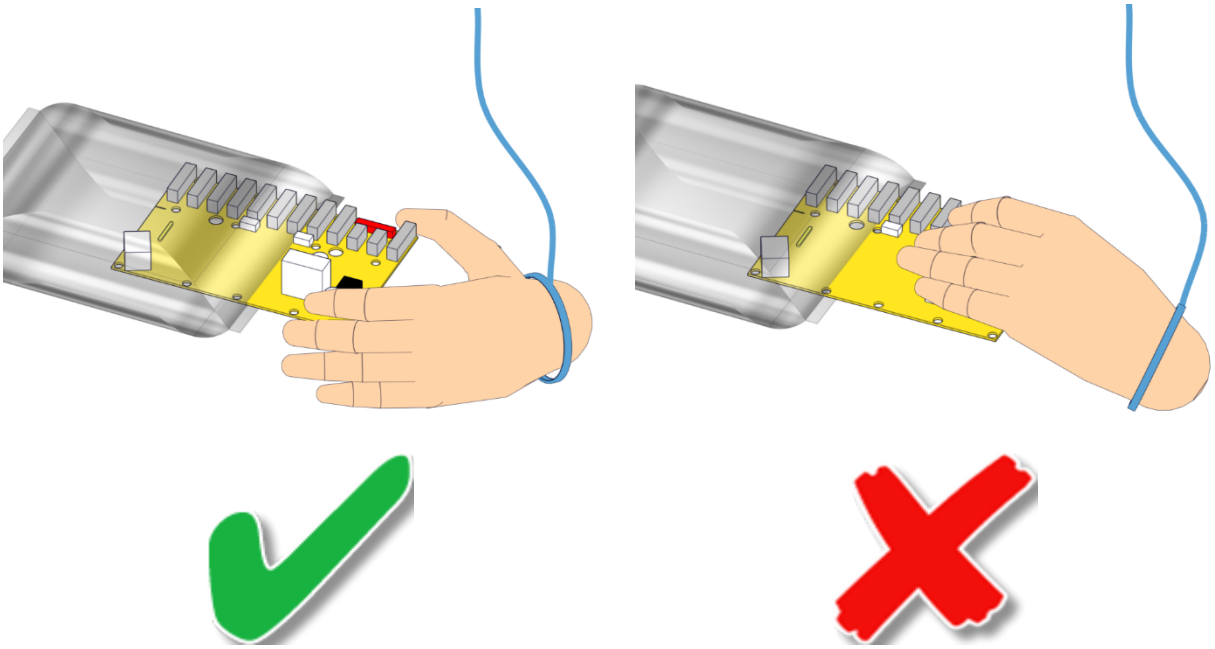
Replacing an ESD-sensitive part in a safe way is important to avoid damage to the part. It is important to take precautions when handling an ESD-sensitive part.



NOTICE

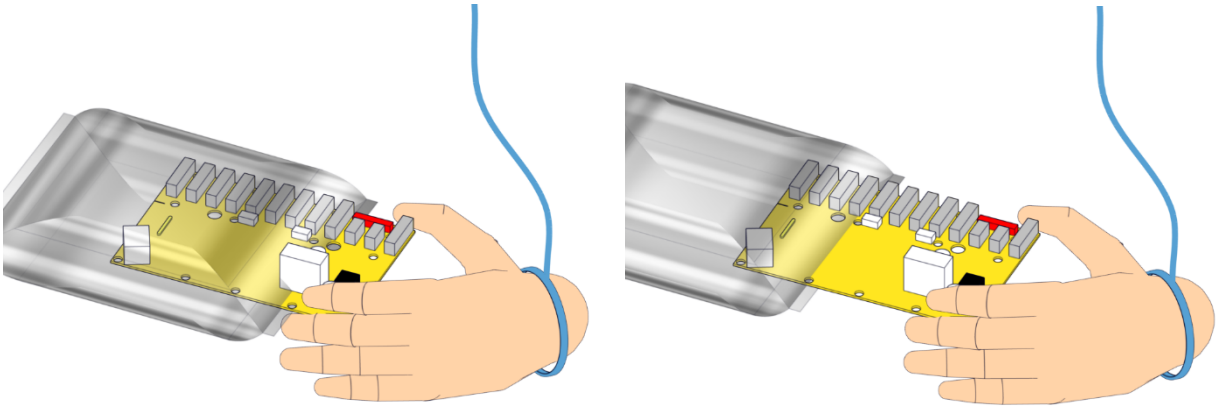
Hold the ESD-sensitive part by its edges. Do not touch its pins or hold directly on any exposed prints.

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NOTICE

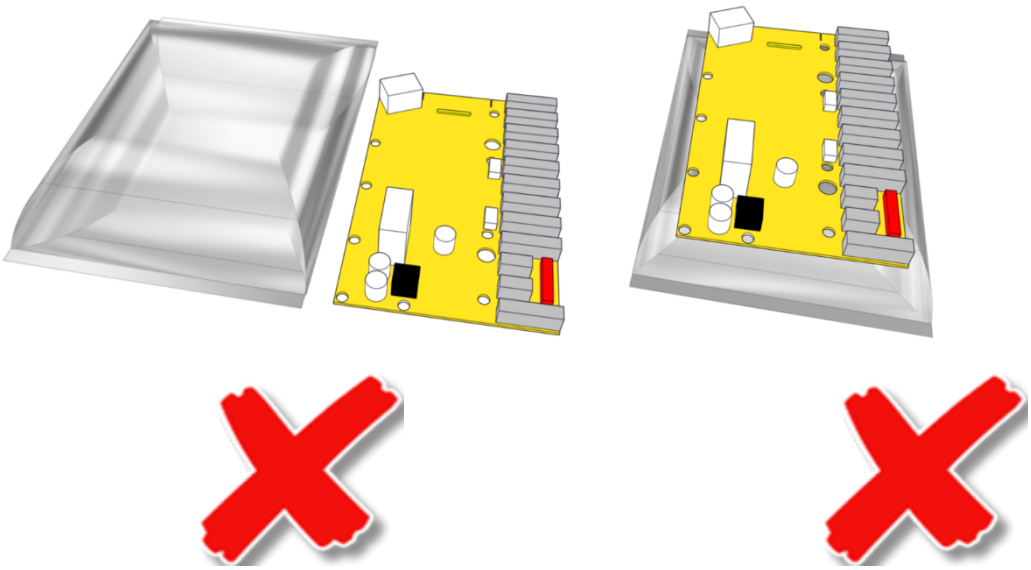
First place the OLD part in the spare ESD bag, then take out the NEW part of the ESD bag.



NOTICE

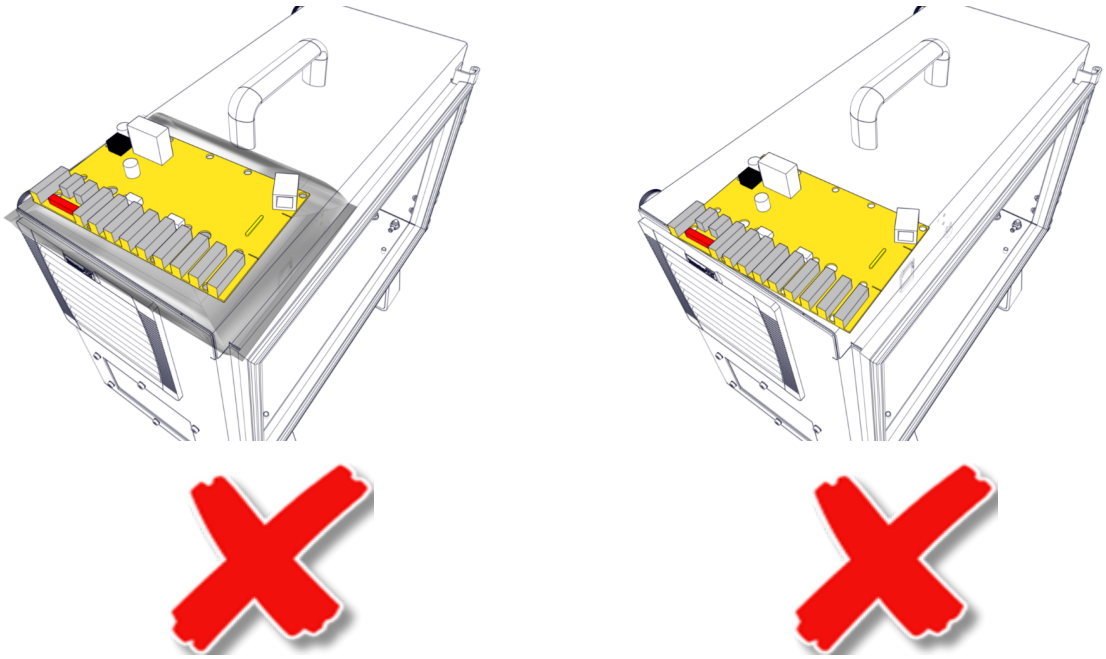
Do not place the ESD-sensitive part on nonconductive material or on metal tables/surfaces. If you must put down the ESD-sensitive part for any reason, then first place it into the ESD bag.

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NOTICE

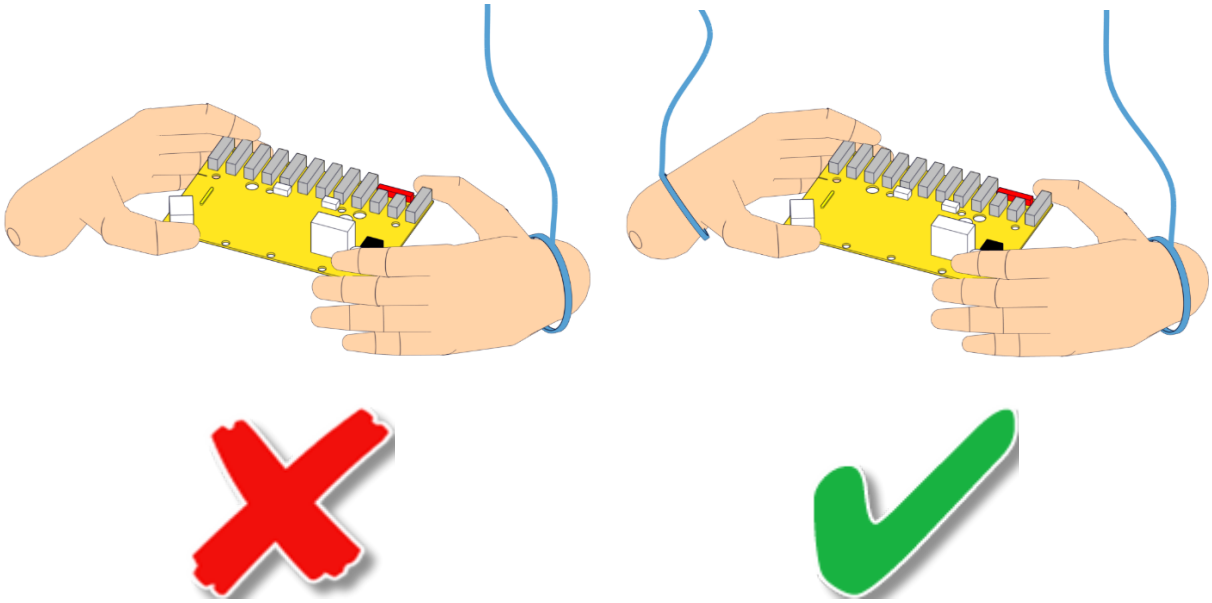
Machine covers and metal tables/surfaces are electrical grounds. They increase the risk of damage because they make a discharge path from your body through the ESD-sensitive part. (Large metal objects can be discharge paths without being grounded.)



NOTICE

If passing an ESD-sensitive part to another person, ensure both are wearing ESD wristband and the ESD wristband is attached to the system grounding point.

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NOTICE

Be extra careful in working with ESD-sensitive parts when cold-weather and heating is used, because low humidity increases static electricity.

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3. Recommended Inspection Activities

3.1. Robot Arm

3.1.1. Inspection Plan

The table below is a checklist of the type of inspections recommended by Universal Robots. Perform inspections regularly as advised in the table. Any referenced parts found to be in an unacceptable state must be rectified or replaced.

See the following sections for detailed guidance:

- 3.1.2. Visual Inspection: Robot arm below
- 4.1. Pre-Use Assessment on page 16
- 4.2. Robot Arm on page 17

Inspection action type			Timeframe		
			Monthly	Biannually	Annually
1	Check blue lids *	V		✘	
2	Check blue lid screws	F		✘	
3	Check flat rings	V		✘	
4	Check robot cable	V		✘	
5	Check robot cable connection	V		✘	
6	Check Robot Arm mounting bolts *	F	✘		
7	Check Tool mounting bolts *	F	✘		
8	Check screws/bolts on joints *	F		✘	

V = Visual inspection F = Functional inspection * = Must also be checked after heavy collision

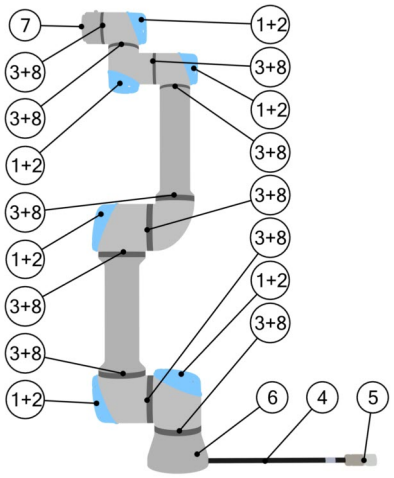
3.1.2. Visual Inspection: Robot arm

NOTICE

Using compressed air to clean the robot arm can damage the robot arm components.

- Never use compressed air to clean the robot arm.

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1. Move the Robot Arm to ZERO position, if possible.
2. Turn off and disconnect the power cable from Control Box.
3. Inspect the cable between Control Box and Robot Arm for any damage.
4. Check the base mounting bolts are properly tightened.
5. Check the tool flange bolts are properly tightened.
6. Inspect the flat rings for wear and damage.
   - Replace the flat rings if they are worn out or damaged.
7. Inspect the blue lids on all the joints for any cracks or damage.
   - Replace the blue lids if they cracked or damaged.
8. Inspect the screws used for the blue lids are in place and properly tightened.
   - Replace or tighten screws, if necessary.
   - Correct the torque value for screws on the blue lids to 0.4 Nm $^{+0.05Nm}_{-0.05Nm}$

NOTICE

If any damage is observed on a robot within the warranty period, contact the distributor where the robot was purchased.

3.1.3. Functional Inspection

Do functional inspections to ensure the robot arm and its screws, bolts and tools are not loose.

Use a correctly calibrated torque wrench, specified in Torque Values to check the screws and bolts listed in the inspection plan.

For the robot arm mounting bolts specifications, see the Hardware Installation Manual, chapter Mechanical Interface: Mounting.

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3.1.4. Cleaning your robot

Everyday cleaning

You can wipe away any dust/dirt/oil observed on the robot arm and/or Teach Pendant using a cloth and one of the following cleaning agents: Water, Isopropyl alcohol, 10% Ethanol alcohol or 10% Naphtha. In rare cases, very small amounts of grease can be visible from the joint. This does not affect the function, use, or lifetime of the joint.

Additional cleaning

Due to the added focus on cleaning your robot, Universal Robots recommends cleaning with 70% isopropyl alcohol (rubbing alcohol).

1. Wipe the robot with a hard twisted micro fiber cloth and 70% isopropyl alcohol (rubbing alcohol).
2. Let the 70% isopropyl alcohol dwell on the robot for 5 minutes, and then clean the robot using standard cleaning procedure.

DO NOT USE BLEACH. Do not use bleach in any diluted cleaning solution.

3.2. Control Box and Teach Pendant

3.2.1. Inspection Plan

The table below is a checklist of the type of inspections recommended by Universal Robots. Perform inspections regularly as advised in the table. Any referenced parts found to be in an unacceptable state must be rectified or replaced.

See the following sections for detailed guidance:

- 3.2.2. Functional and Safety Inspection on the next page
- 3.1.2. Visual Inspection: Robot arm on page 9
- 4.1. Pre-Use Assessment on page 16
- 8.4. Control Box on page 210

Inspection action type			Timeframe		
			Monthly	Biannually	Annually
1	Check Emergency stop on Teach Pendant	F	✘		
2 & 3	On a standard TP: check the freedrive button by pressing it gently. On a 3PE TP: check the 3PE buttons pressing them gently.	F		✘	
	Check Backdrive mode	F	✘		
	Check Freedrive mode	F		✘	

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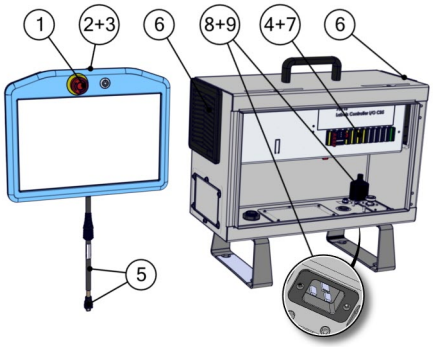
Inspection action type			Timeframe		
			Monthly	Biannually	Annually
4	Check safety inputs and outputs(if connected)	F	✘		
5	Check Teach Pendant cable and connector	V		✘	
6	Check and clean air filters on Control Box	V	✘		
7	Check terminals in Control Box	F		✘	
8 & 9	Check electrical grounding 1< Ω to Control Box	F			✘
	Check main power to Control Box	F			✘

V = Visual inspection F = Functional inspection

3.2.2. Functional and Safety Inspection

NOTICE

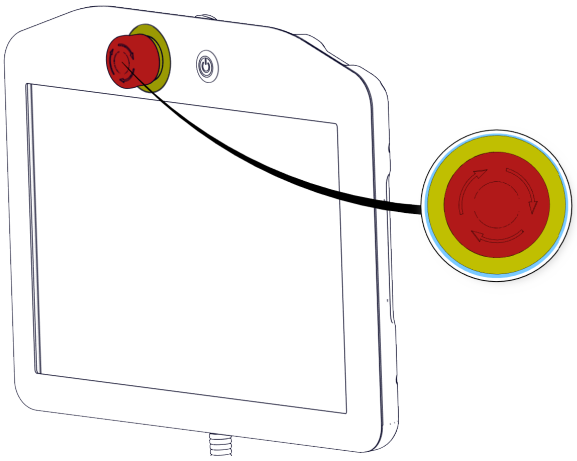
Robot safety functions is highlight recommended be tested monthly to ensure correct function.



Emergency Stop button on the Teach Pendant:

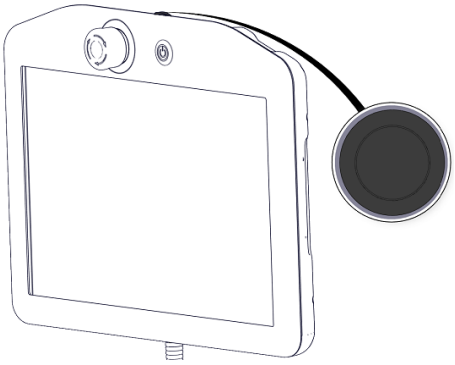
1. Press the Emergency Stop button on the Teach Pendant.
2. Observe the robot stops and shuts off power to the joints.
3. Power on robot again.

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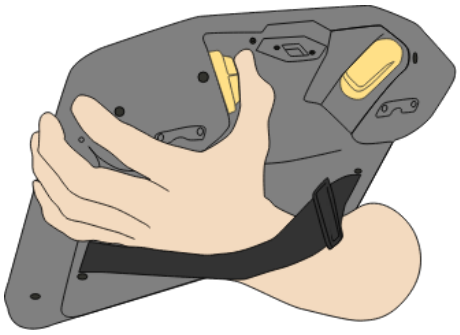


Freedrive

1. Unmount attachment or set TCP/Payload/CoG according to tool specifications.
2. To move the robot arm in Freedrive:
   - On a standard Teach Pendant, press and hold the Freedrive button.
   - On a 3PE Teach Pendant, rapidly light-press, then light-press-and-hold the 3PE button.

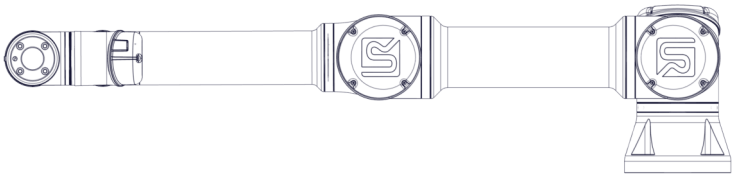


Standard TP



3PE TP

3. Pull/Push the robot to a horizontally elongated position and release.



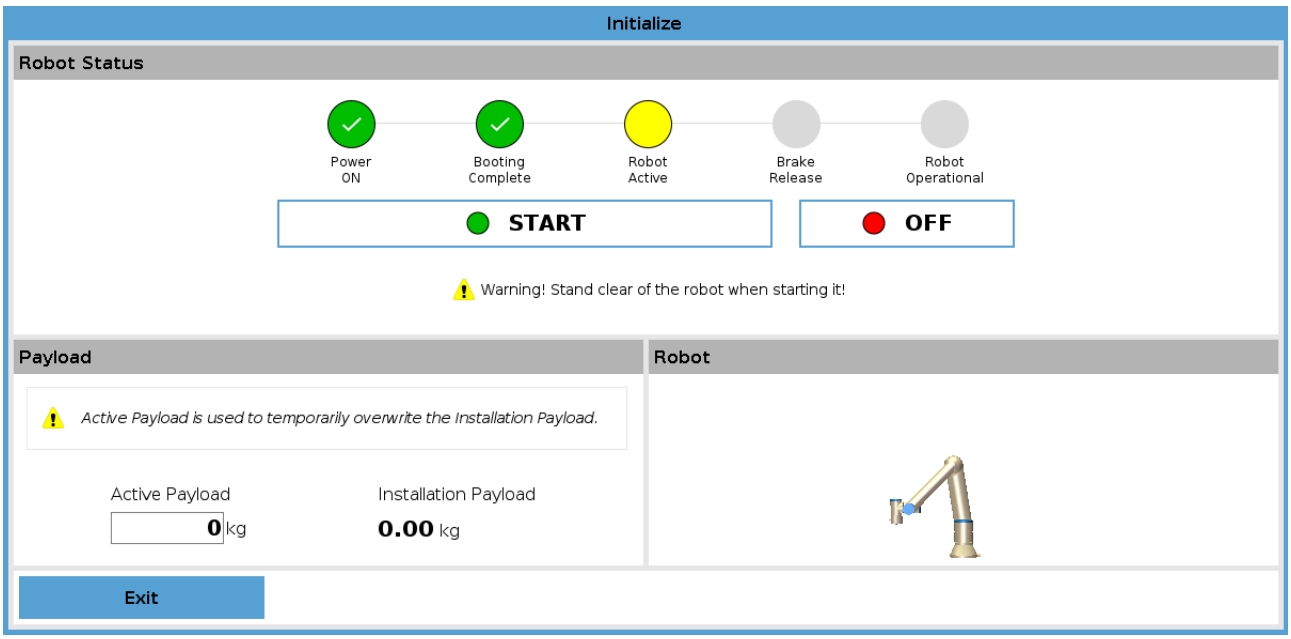
4. Verify the robot arm can maintain the position without support and without pressing the Freedrive, or 3PE button.

Backdrive

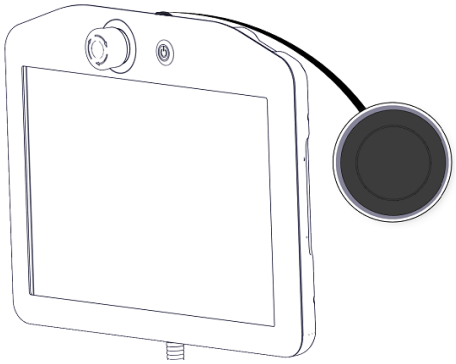
If the robot arm is close to colliding with something, you can use the Backdrive function to move the robot arm to a safe position before (re)initializing it.

1. Press ON to enable power. Status changes to *Robot Active*

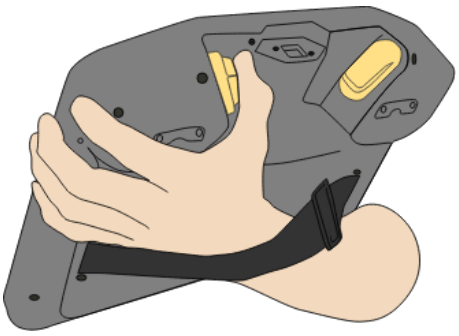
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2. Press and hold Freedrive. Status changes to *Backdrive*



Standard TP



3PE TP

3. Move robot as in Freedrive. Joint brakes are released where needed once the Freedrive button is activated.

NOTICE

The robot arm is “heavy” to move around in Backdrive, so efort is required to move the joints.

MANDATORY ACTION

You must test Backdrive mode on all joints.

Safety settings

Verify the robot safety settings comply with the robot installation risk assessment.

Additional safety inputs and outputs are still functioning

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Check which safety inputs and outputs are active and that they can be triggered via PolyScope or external devices.

Backup data

See section Backup of data

3.2.3. Visual Inspection: Control Box

1. Disconnect the power cable from Control Box.
2. Check the Control Board terminals are properly inserted.Do not ignore loose wires.
3. Check for any dirt/dust inside Control Box. Clean with ESD vacuum cleaner if needed.

NOTICE

Using compressed air to clean the Control Box can cause damage to the Control Box components.

- Never use compressed air to clean the Control Box.

3.2.4. Cleaning

See also

To clean the Teach Pendant touch screen

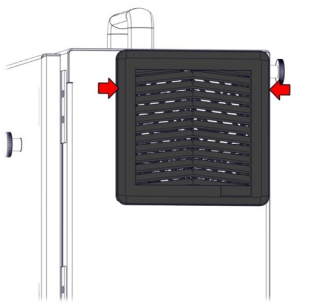
Use a mild, industrial cleaning agent without thinning agents or any aggressive additives. Do not use an abrasive material to wipe down the screen.Universal Robots does not promote a specific cleaning agent.

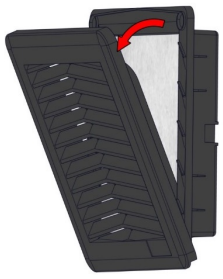
To clean the Control Box filters

There is a filter on either side of the Control Box.

1. Gently remove the outer plastic frame, by pulling where the red arrows are shown in the images below. The frame tilts outward.
2. Remove both filters and use low pressure air to clean them.

   If necessary, replace filters.





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4. Service and Replacement of Parts

4.1. Pre-Use Assessment

Verify all safety inputs and outputs are correctly connected. Test all connected safety inputs and outputs, including devices common to multiple machines or robots, are functioning. The following tests must be conducted before using the robot for the first time or after any modifications are made:

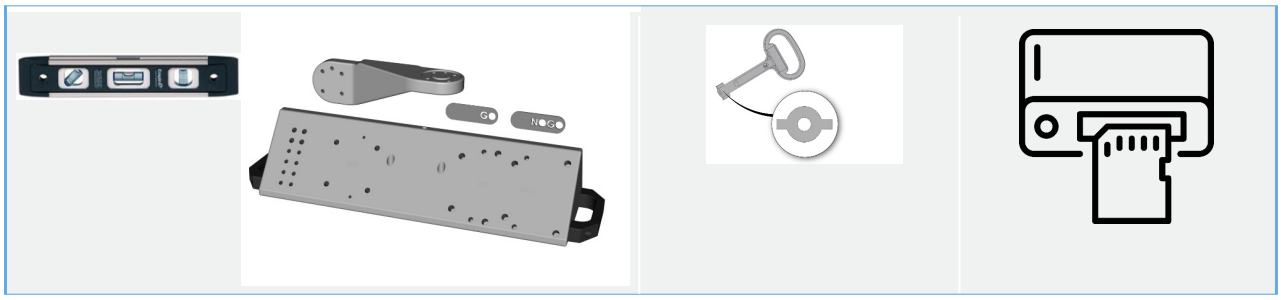
- Test the emergency stop buttons. Check the robot is stopped and the brakes are engaged.
- Test the safeguard input stops the robot's motion. If a safeguard reset is configured, check that it must be activated before motion can resume.
- Test safety boundaries to ensure that Reduced Mode can switch the safety mode and back.
- Test the Operational Mode switches (if connected), see icon in top right corner of user interface to ensure the mode is changing.
- Test the Three-Position Enabling Device (if connected) to enable motion in manual mode and test that the robot is under reduced speed control.
- Test that the System Emergency Stop Outputs can bring the entire system to a safe state.
- Test that the system connected to Robot Moving Output, Robot Not Stopping Output, Reduced Mode Output, or Not Reduced Mode Output can detect the output changes.

Read Section 9 to learn how to pack down and ship the robot and/or spare parts. Packing and Shipping of Robot/Spare Parts

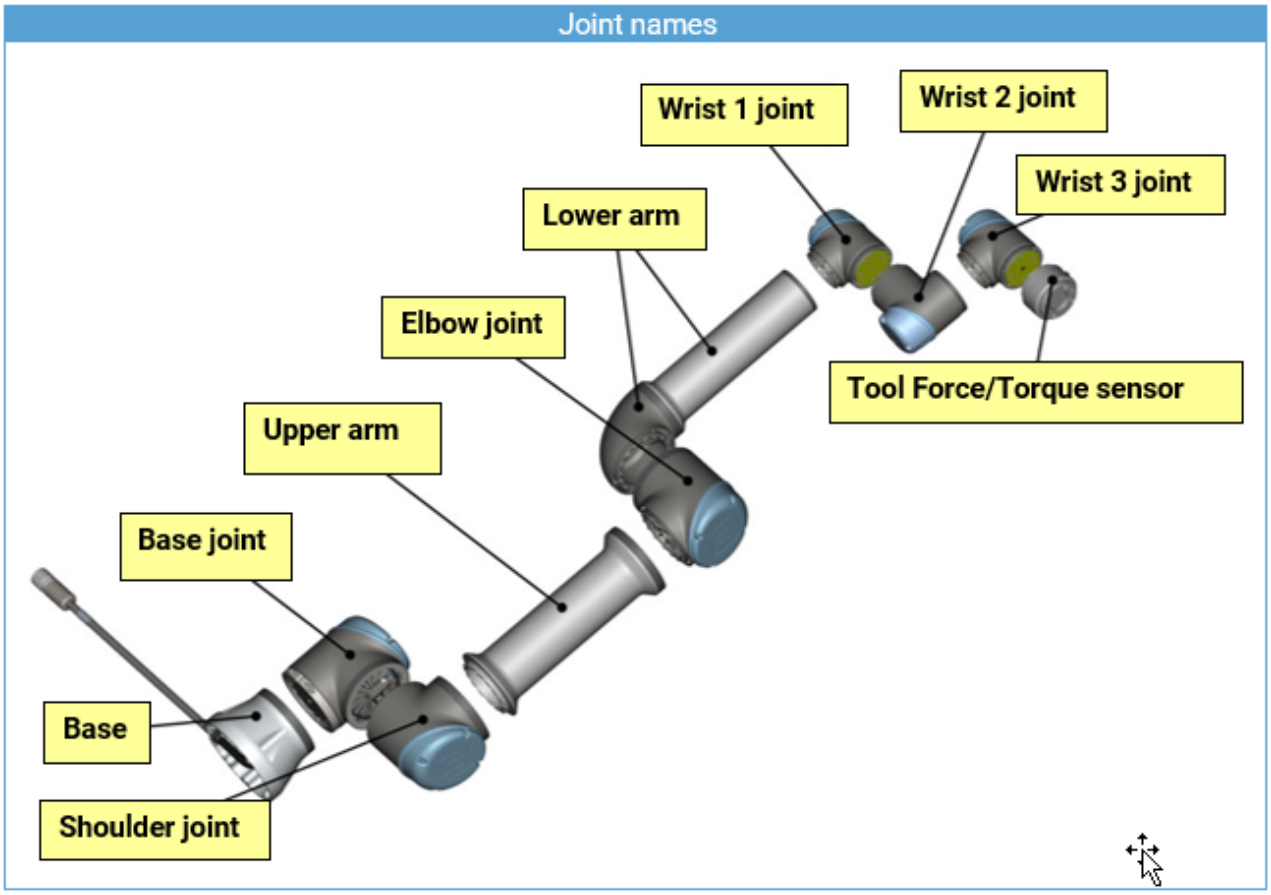
4.1.1. Recommended Tools

Robot Arm	Control Box	
Service tools - part no.: 109011	Service tools - part no.: 109011	
		
Spirit level or Dual Robot Calibration tooling part no.: 185500	Cabinet key (double-bit key)	SD card reader

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4.2. Robot Arm



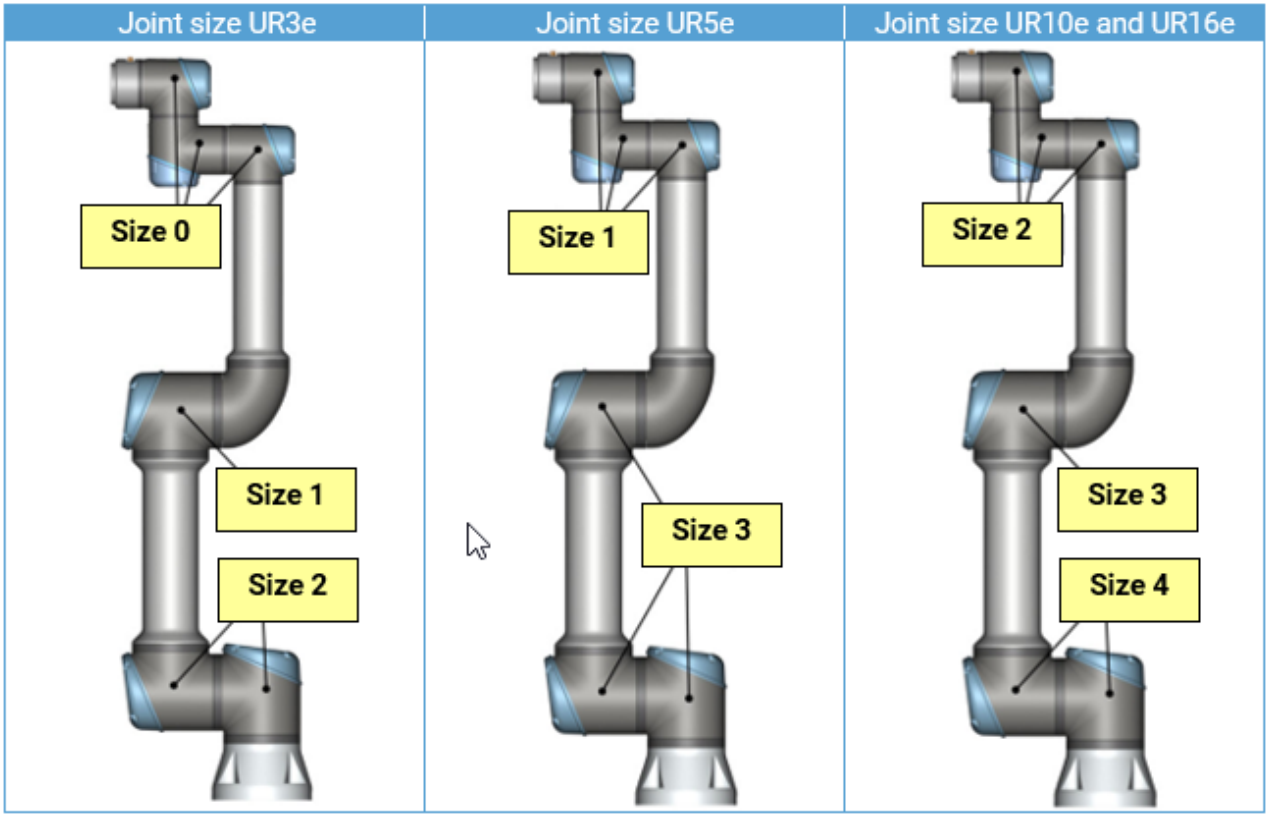
4.2.0. Size 3 Joint on UR10e

Using size 3 joints manufactured before November 12, 2020, as a replacement for any UR10e size 3 elbow joint (either UR10e with 12,5kg max. payload or UR10e with 10kg max. payload) may damage the housing.

If you hold any spare part joint size 3 from previously to 12 November 2020, only use it for replacements of UR5e robots' joints.

Under no circumstances use joints from robots previously to 12 November 2020 as replacements to UR10e size 3 elbow joint. Size 3 joints from previously to: Serial Number: 20205001663. Date: 12 November 2020. Must only be used as spare parts for UR5e robots.

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4.2.1. Movement Without Drive Power

In the unlikely event of an emergency, when the robot power is either impossible or unwanted, you can use forced back-driving or contact your Universal Robots distributor if this is not possible.

To perform forced back-driving you must push, or pull, the Robot Arm hard to move the joint. Each joint brake has a friction clutch that enables movement during high forced torque.

NOTICE

Moving the Robot Arm manually is intended for urgent emergency and service purposes only.
The brake inside each joint is not designed for manual release. Attempting to do so without proper training may cause damage to the brake and other joint components. This will make the joint un-usable.
Do not move the joint more than necessary.
Not more than 160 degrees to ensure the robot can find its original physical position.

CAUTION

Attempting to release a joint brake manually may result in injuries personnel or damage to equipment.

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4.2.2. General Guidance to Separate Joint from Counterpart

WARNING

Before replacing ANY components inside the Control Box, it is important to completely shut it down first. Follow the first 3 steps in Complete Rebooting Sequence

NOTICE

Exercise caution when handling ESD sensitive parts. See Section 2: Handling ESD-Sensitive Parts

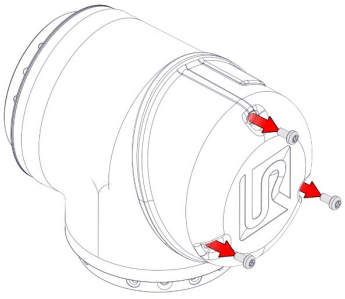
Disassemble:

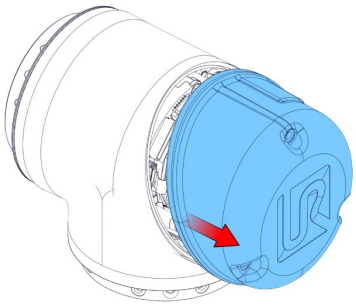
1. Before repairing the robot, make sure the necessary tools are available.
    1. Service tools with torque tools, ESD Wristband, etc.
    2. If you must disassemble the Robot Arm you will need:
    new flat rings, wear rings, M3 and M4 tap tool("roll tap" or "forming tap") for threads, pre-coated screws, or Loctite.

MANDATORY ACTION

Before continuing, read the complete guide in this manual.

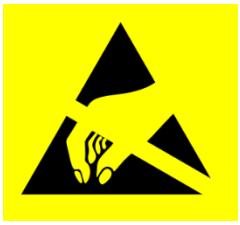
2. Move the robot to an appropriate position for disassembly.
3. Shut down the Control Box and remove the main power.
4. If necessary, dismount the entire Robot Arm from the work cell and place on a solid surface.
5. Remove screws and the blue lid.

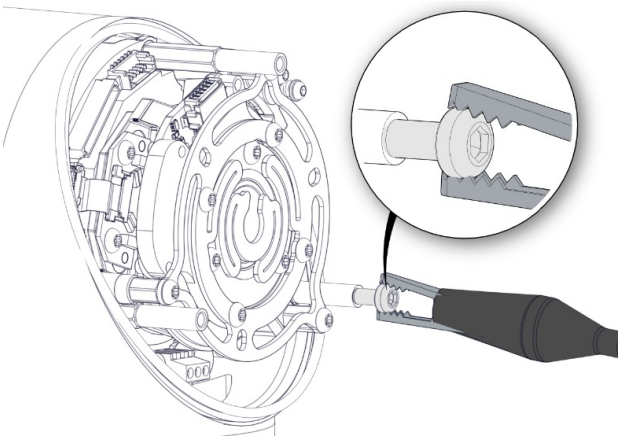




6. Now reattach one of the screws, on one of the standoffs and mount the alligator clip on your ESD wristband, as shown below.

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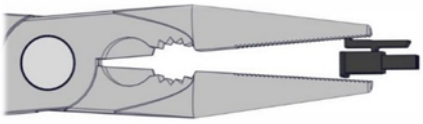




NOTICE

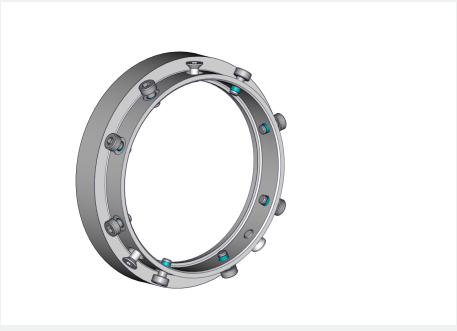
Some connectors have a lock that must be engaged before it is pulled out of the printed circuit board.

7. **Gently** unplug the cable connectors without bending the printed circuit board.



4.2.3. Joint Connection Types

There are two different ways the joints are assembled.

Screw Connection				Bracket Connection			
							
Head Size	Torque			Head Size	Torque		
Torx T10	1.3Nm	+0,10Nm -0.10Nm		Hex key 4	5.0Nm	+0.00Nm -1.00Nm	
Torx T20	3.0Nm	+0.30Nm -0.30Nm					

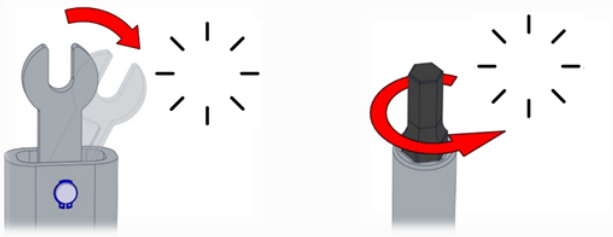
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4.2.4. Torque Values

Connection	Head size	Torque	
Screw Connection	Torx T10	1.3Nm	+0,10Nm -0.10Nm
Screw Connection	Torx T20	3.0Nm	+0.30Nm -0.30Nm
Bracket Connection	Hex key 4	5.0Nm	+0.00Nm -1.00Nm
Blue lid screws	Torx T10	0.4Nm	+0.05Nm -0.05Nm
Tool connector	No tools to be used	0.4Nm	
Tool mounting		Max. 8.0Nm	

NOTICE

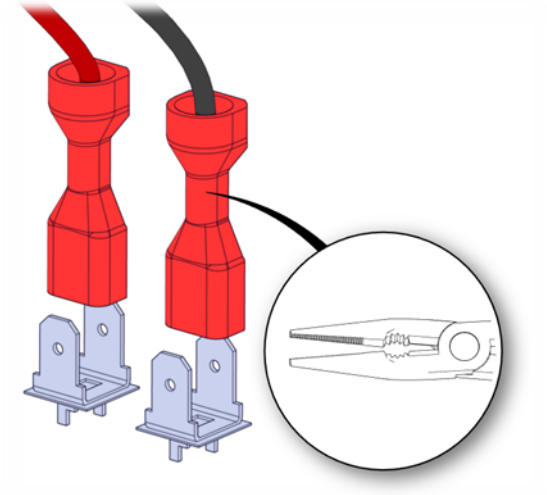
Click the torque tools a minimum of three times before use, to get the correct calibrated torque.



4.2.5. Power and Communication Connector Types on the Joint

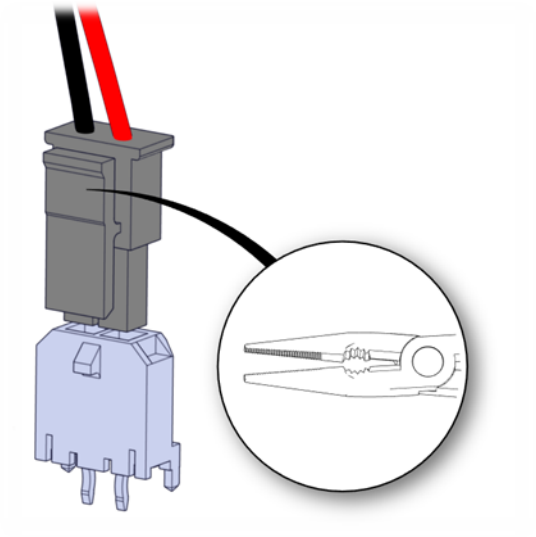
There are two different power plug types and one plug type for communication.

Power Plug Types



This plug can be removed by **GENTLY** pulling in the **plug**.

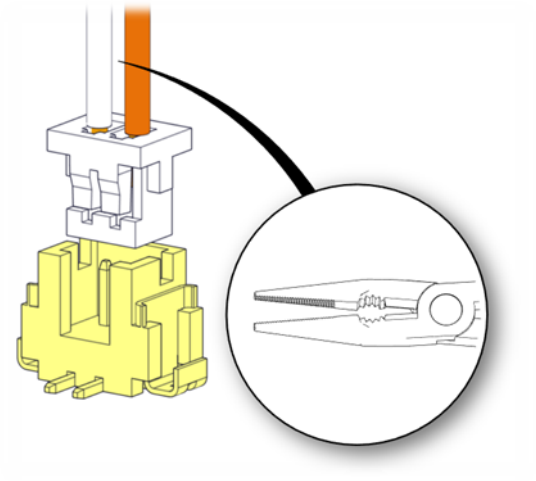
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This plug has a lock. Use a flat-nose plier or fingers to unlock and **GENTLY** pull in the **plug**.

Communication Plug Type

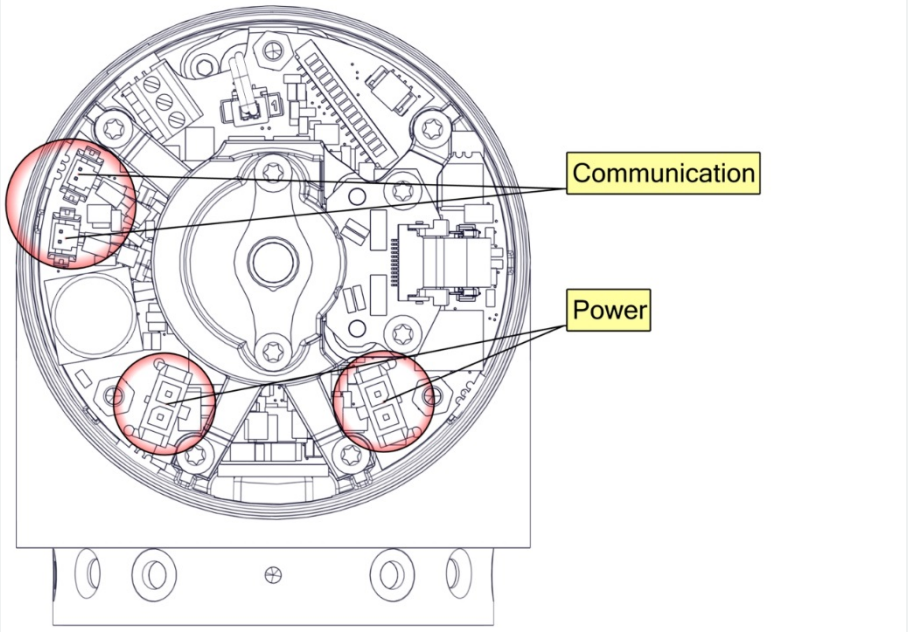


This plug can be removed by **GENTLY** pulling in the **wire**.

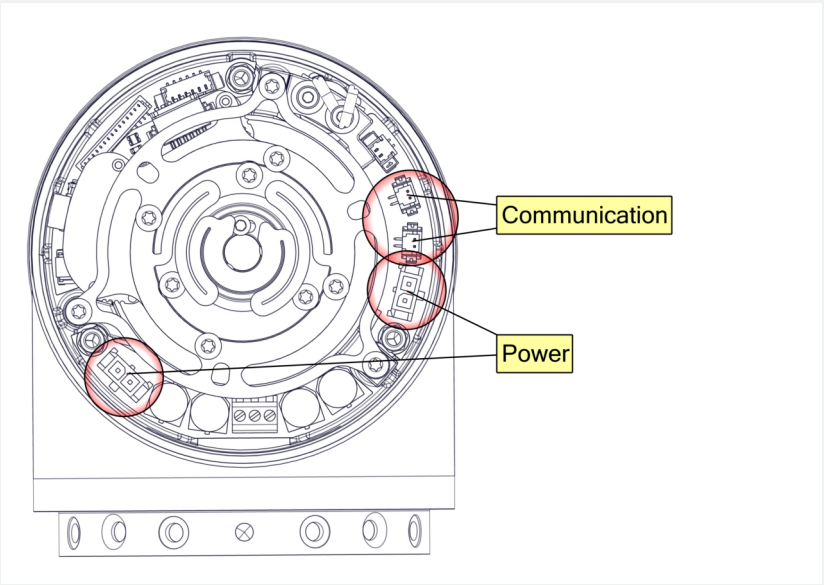
4.2.6. Connector Location on joints

Size 0

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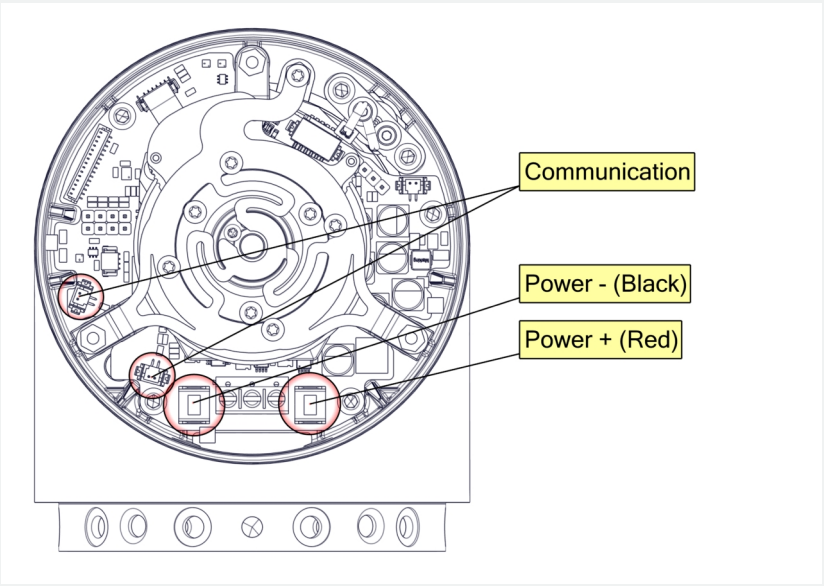


Size 1

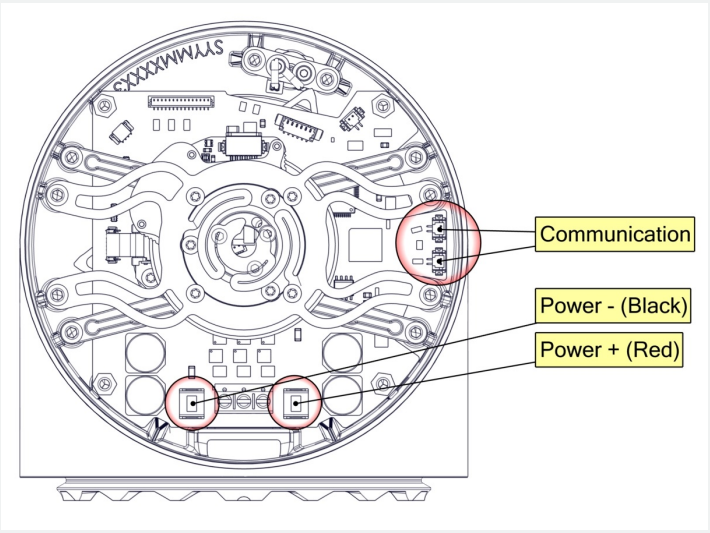


Size 2

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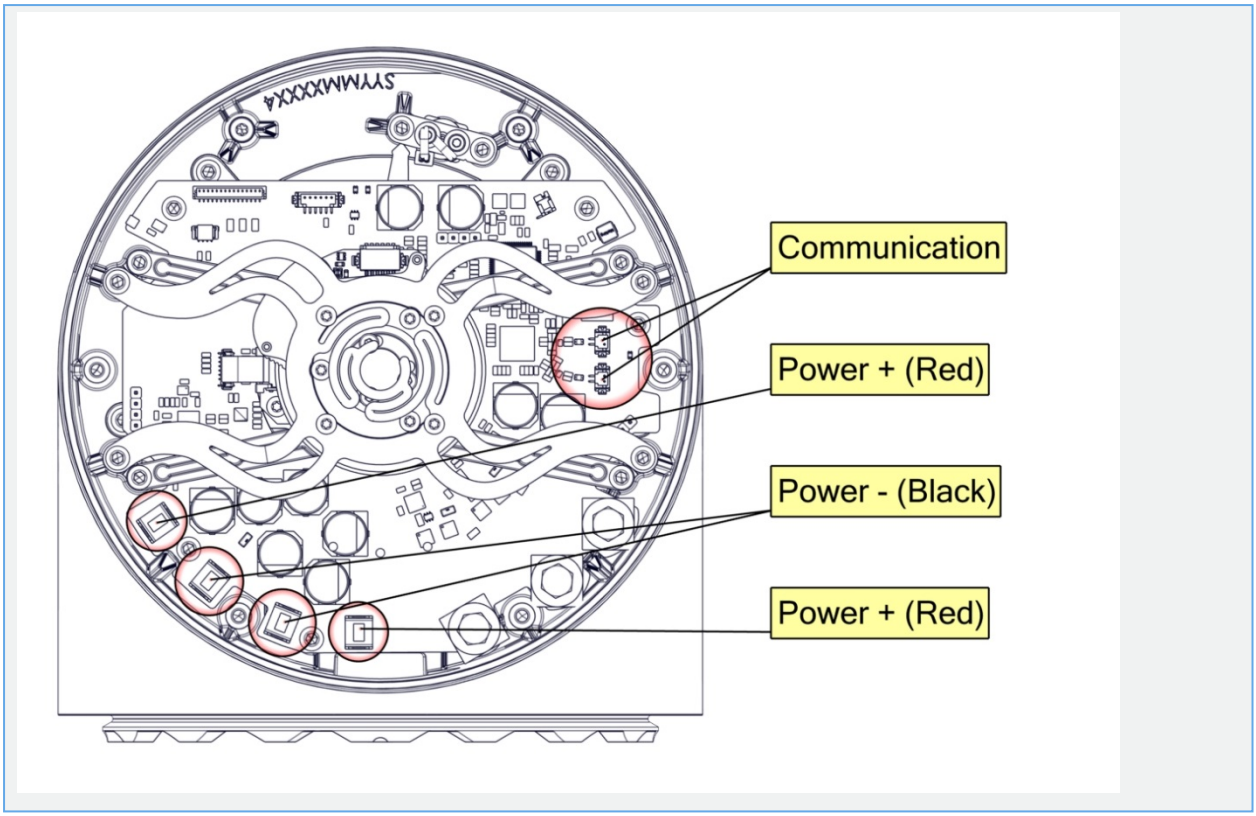


Size 3



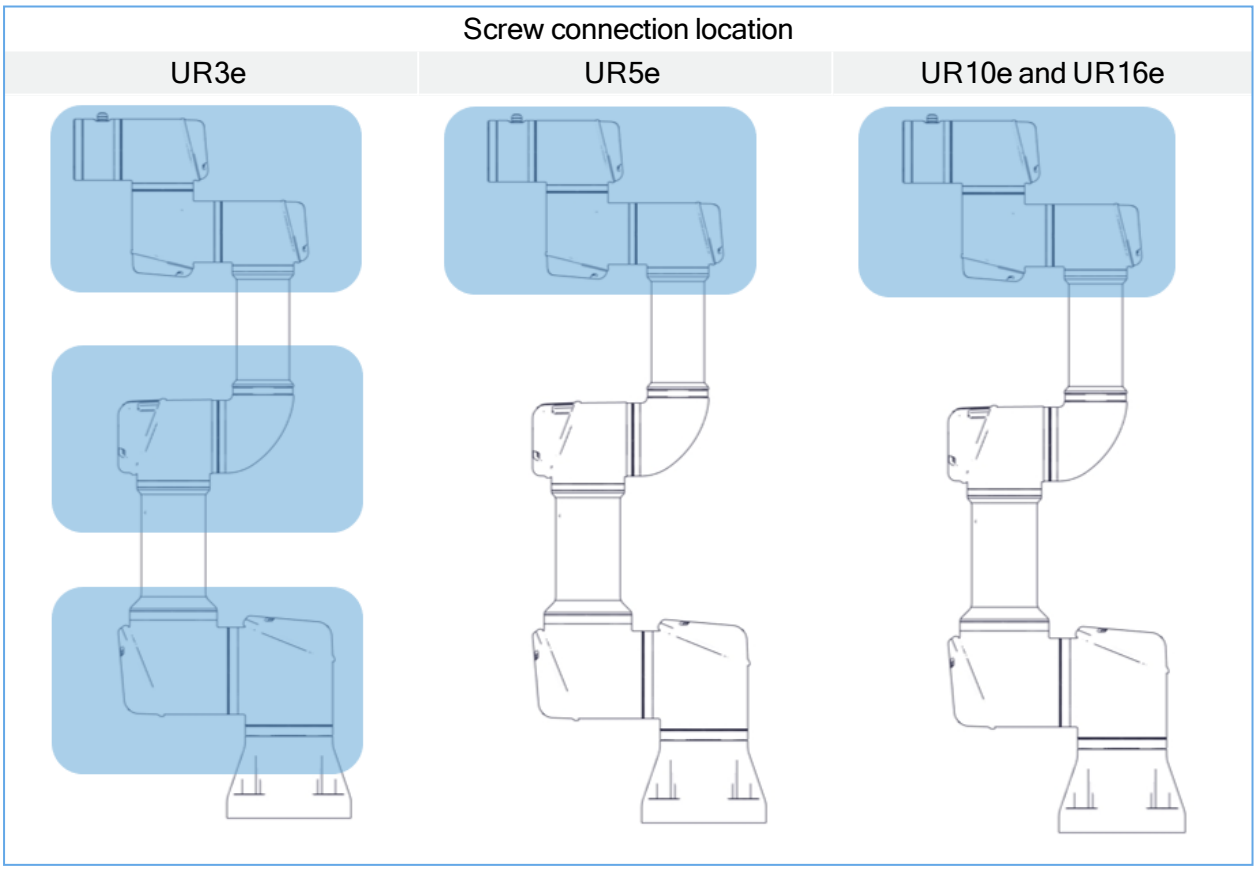
Size 4

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4.2.7. Screw Connection

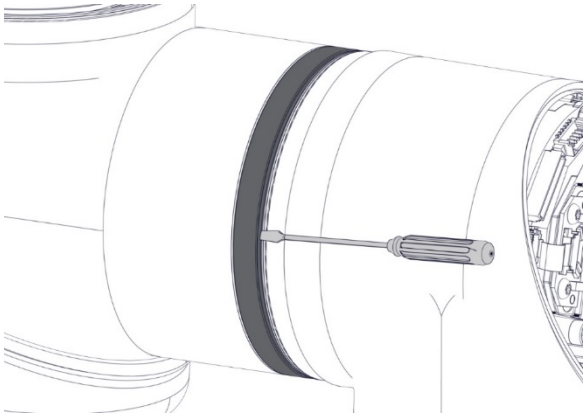
The following two sections describe how to disassemble and assemble a joint with a screw-connection.

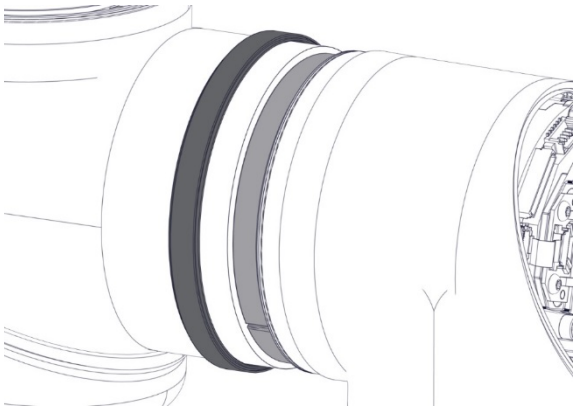


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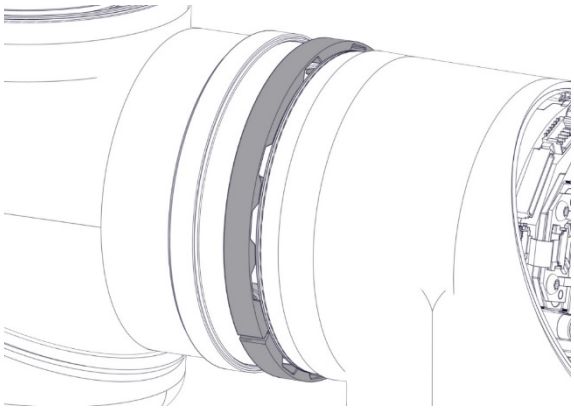
Disassembling Screw Connection

1. Remove the screws in the blue lid, then remove the blue lid as shown in Section General Guidance to Separate Joint from Counterpart
2. **Gently** remove the power and communications wires from the terminals as shown in Section Power and Communication Connector Types on the Joint and Connector Location on joints.
3. You can use a small flathead screwdriver to push-off the flat-ring.
   Then slide the flat-ring over the joint.





4. Remove Teflon-ring.

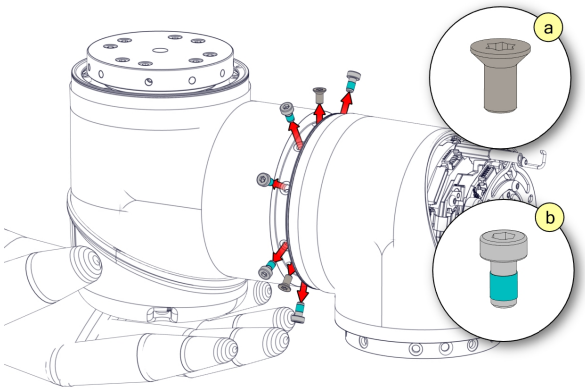


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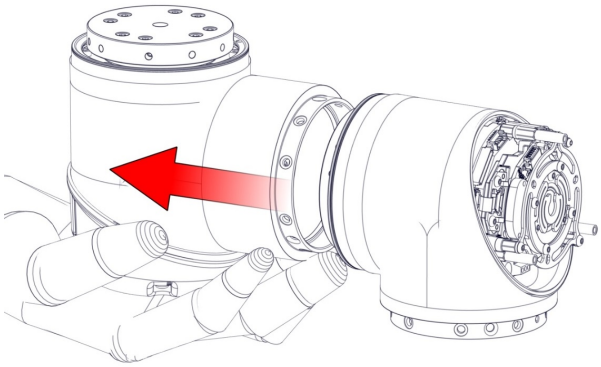
MANDATORY ACTION

The joint can fall off if not supported when removing the screws.

5. First remove the countersunk screws(a) then the remaining(b) screws.



6. The joint is now loose and can be removed. Remember to pull the wires out.



Assemble Screw Connection Joint

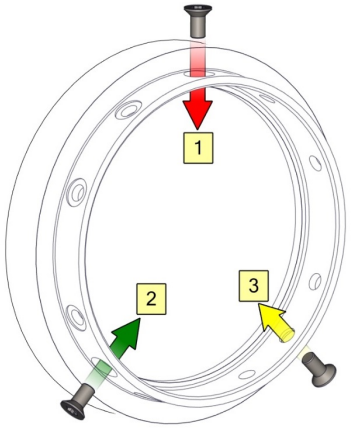
The assembly is done in reverse of the disassembly. However, a few things must be noted before assembly is begun.

NOTICE

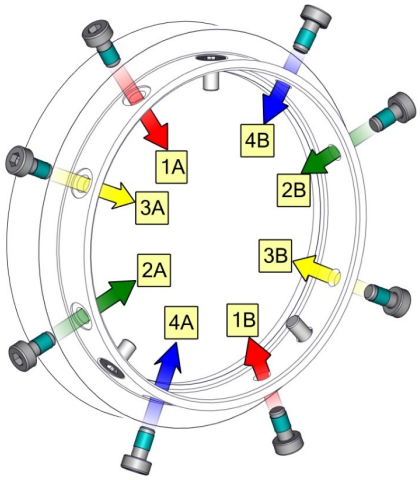
Remove old Loctite residue in the screw holes with a roll tap or forming tap (Size 2 M4 the rest M3) for threads before assembling the joint to get the correct torque on the new screws.
Always use new pre-coated screws when possible. If you must assemble with old screws, carefully clean the screws and add Loctite 243 to the screws before assembly.
Always replace the black flexible flat ring with a new one to maintain the IP classification.
Replace the wear rings if extensive wear or damage is shown

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1. Orient the joints according to the marks (indicated by red arrows in the image below) and gently push the two joints together.
2. Insert and tighten the hex countersunk screws according to the image below. Do not exceed recommended torque.
   Example: 1, 2, 3



3. Insert and tighten the hex screws according to the image below. Do not exceed recommended torque.
   Example: 1A, 1B, 2A, 2B etc.

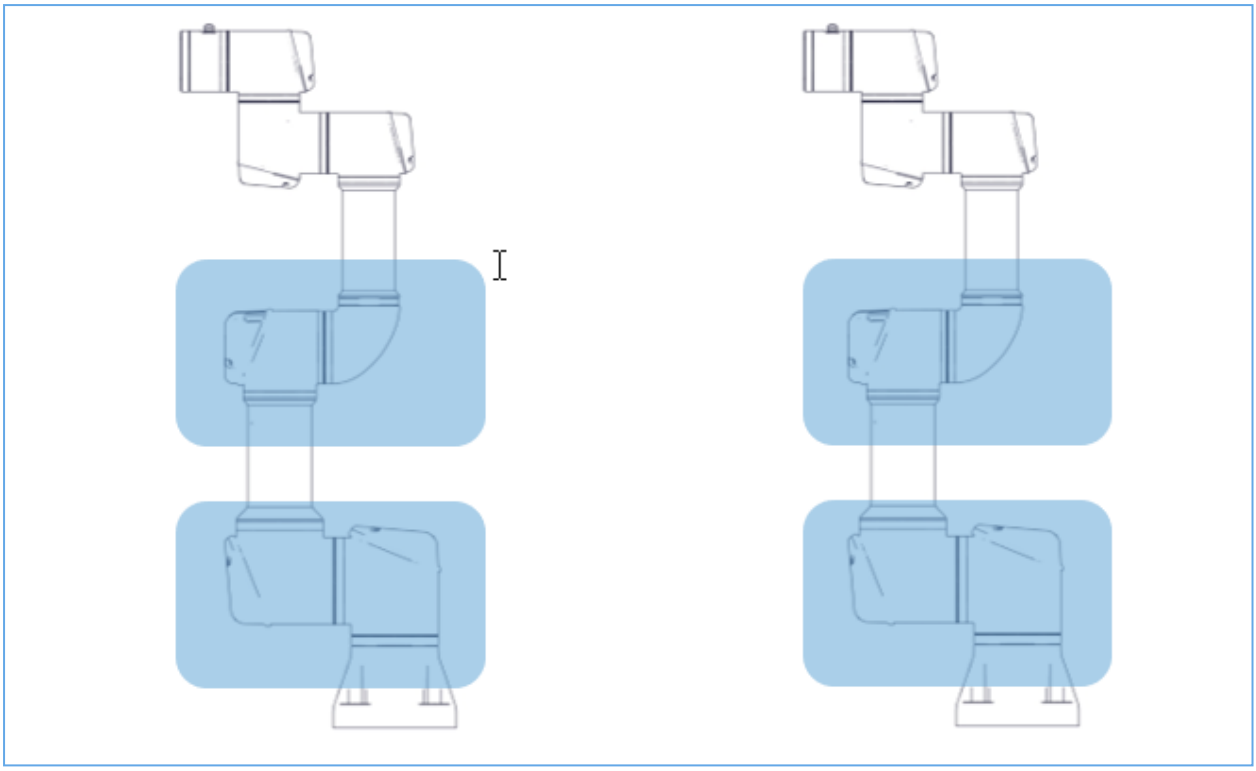


4.2.8. Bracket Connection

The following two sections describe how to disassemble and assemble a joint with a bracket-connection.

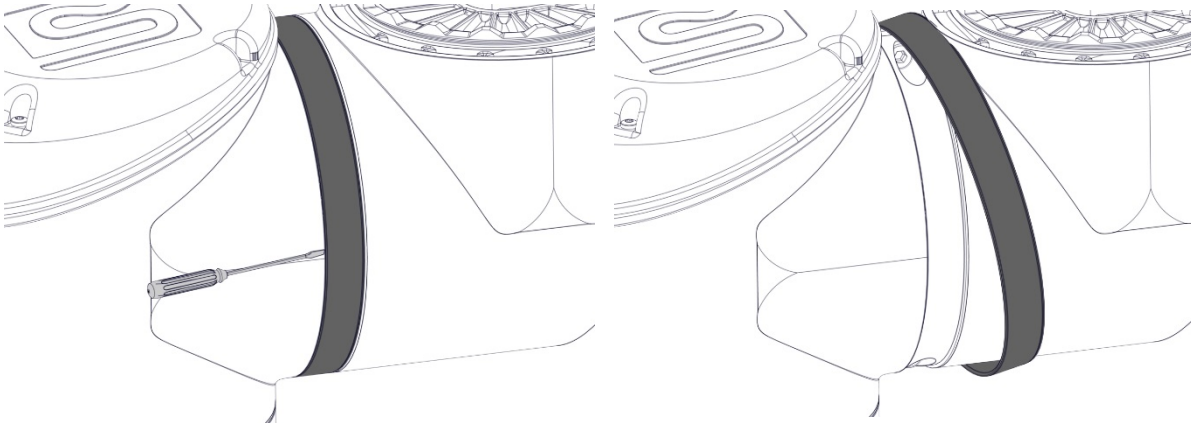
Bracket connection location	
UR5e	UR10e and UR16e

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Disassembly Bracket Connection

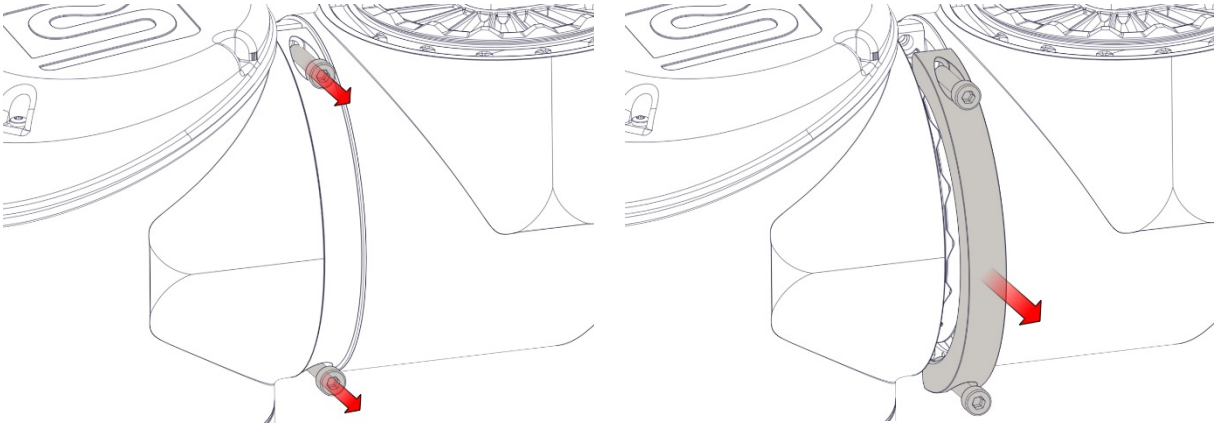
1. Remove the screws in the blue lid, then remove the blue lid as shown in Section General Guidance to Separate Joint from Counterpart.
2. **Gently** remove the power and communications wires from the terminals as shown in Section Power and Communication Connector Types on the Joint and Connector Location on joints.
3. Remove the black flat-ring. You can use a small flathead screwdriver.



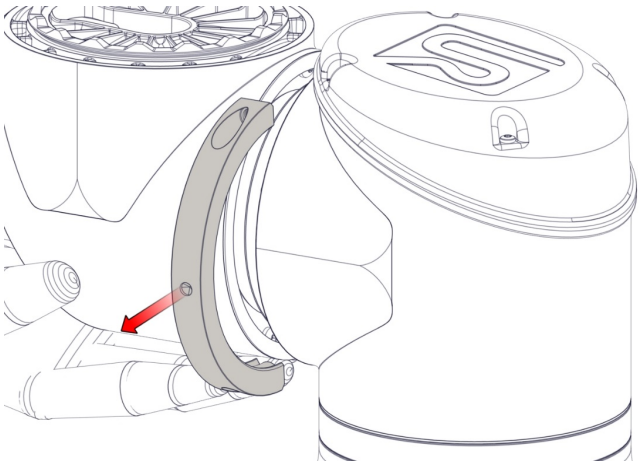
4. Remove the screws and the bracket on one side.

> **MANDATORY ACTION**
>
> The joint can fall off if not supported when removing the bracket.

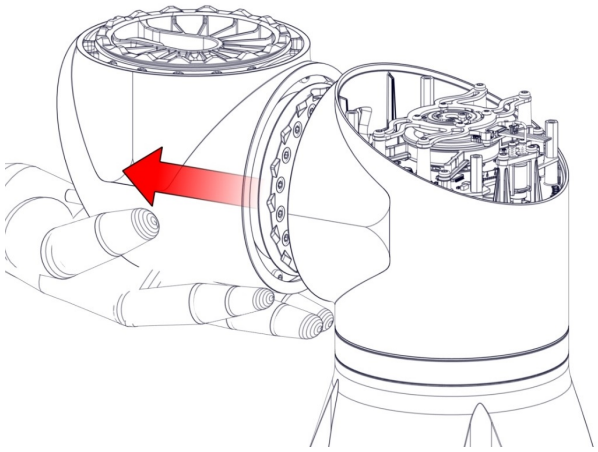
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5. Support the joint as you remove the second side of the bracket.



6. The joint is now loose and can be removed. Remember to pull the wires out as well.



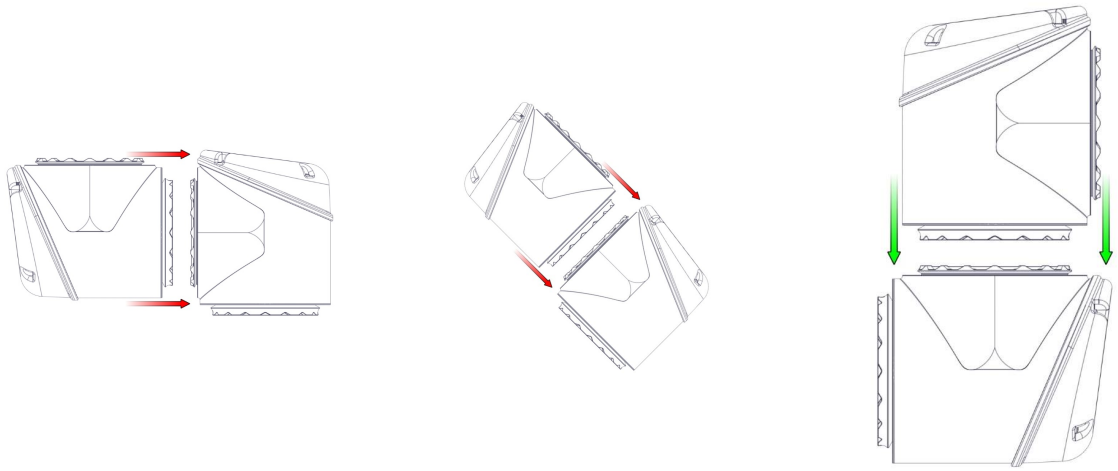
Assembling Bracket Connection

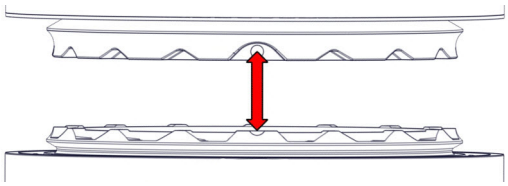
The assembly is done in reverse of the disassembly. However, a few things must be noted before assembly is begun.

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NOTICE

Always replace the black flexible flat ring with a new one to maintain the IP classification.
Replace the foam seal on the brackets if damaged to maintain the IP classification.
Replace the wear rings if extensive wear or damage is shown.
The dots must be aligned otherwise the connection cannot be made.

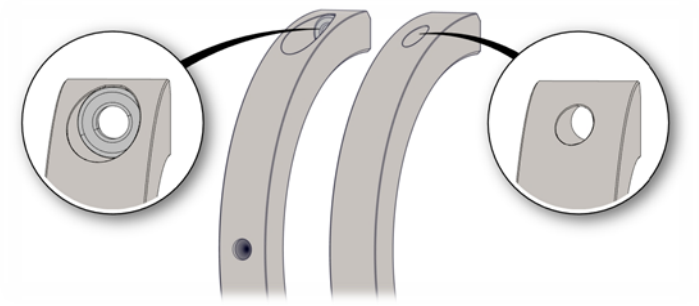




CAUTION

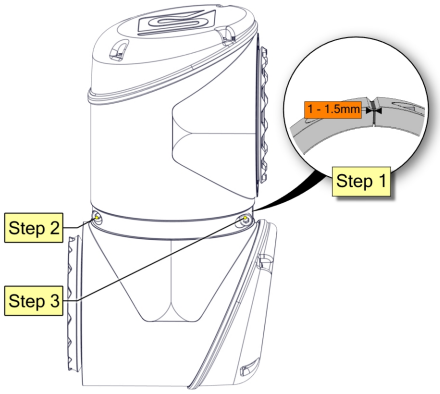
Joints should be assembled in a vertical position to ensure proper mating between the joints.
Ensure the screws are inserted in the correct bracket.
Only apply to early version of brackets where one side has a circular marker.

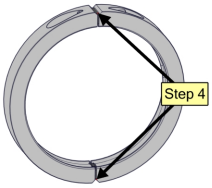
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When tightening the brackets, it must be done in steps. Do not exceed recommended torque:

- Step 1: Tighten one side so there is a gap of 1.0mm to 1.5mm.
- Step 2: Tighten the other side completely with $5.0\ ^{+0.0}_{+1.0}$ Nm
- Step 3: Tighten the first side with $5.0\ ^{+0.0}_{+1.0}$ Nm
- Step 4: Ensure same gap at both ends.





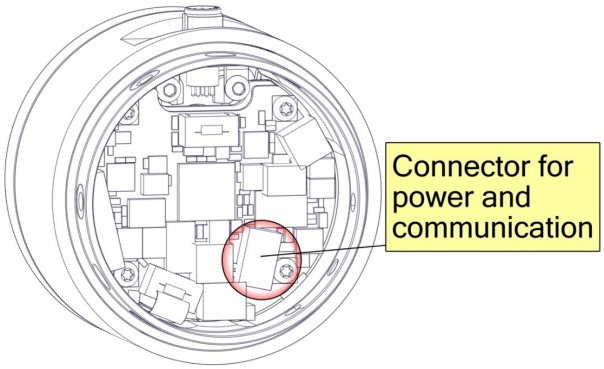
4.2.9. Tool Flange

The tool flange is a Screw Connection and is disassembled like a joint with this connection.
See section Screw Connection
Power and communication plug is in the same plug.

See section Screw Connection

Power and communication plug is in the same plug.

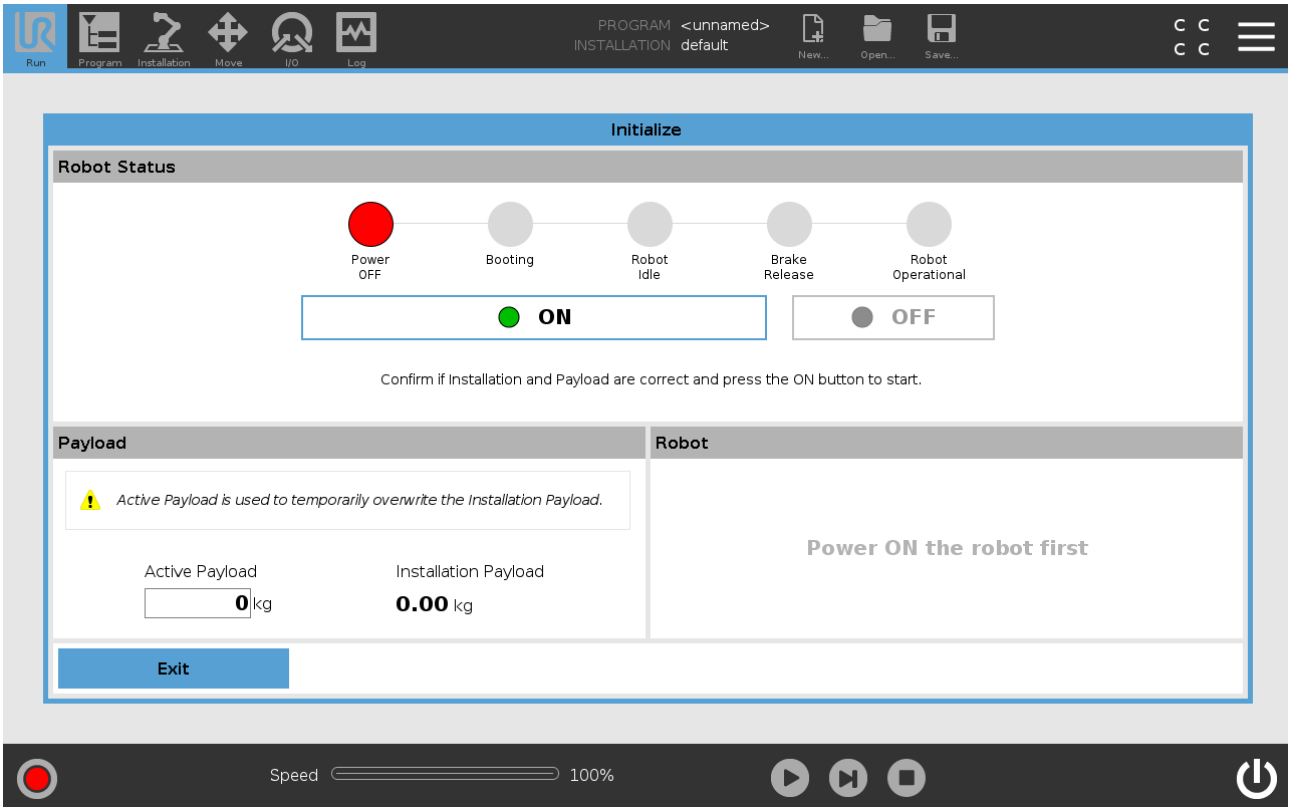
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4.2.10. Joint Verification

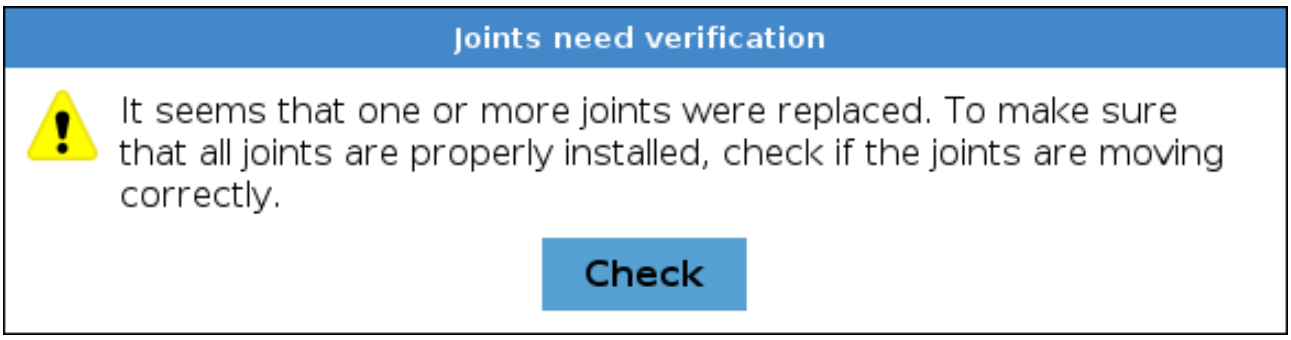
When a joint is replaced it needs to be verified by the controller to be assigned the correct ID. The steps below appear automatically when the Robot Arm is powered on for the first time.

1. Go to Initialize screen and press ON

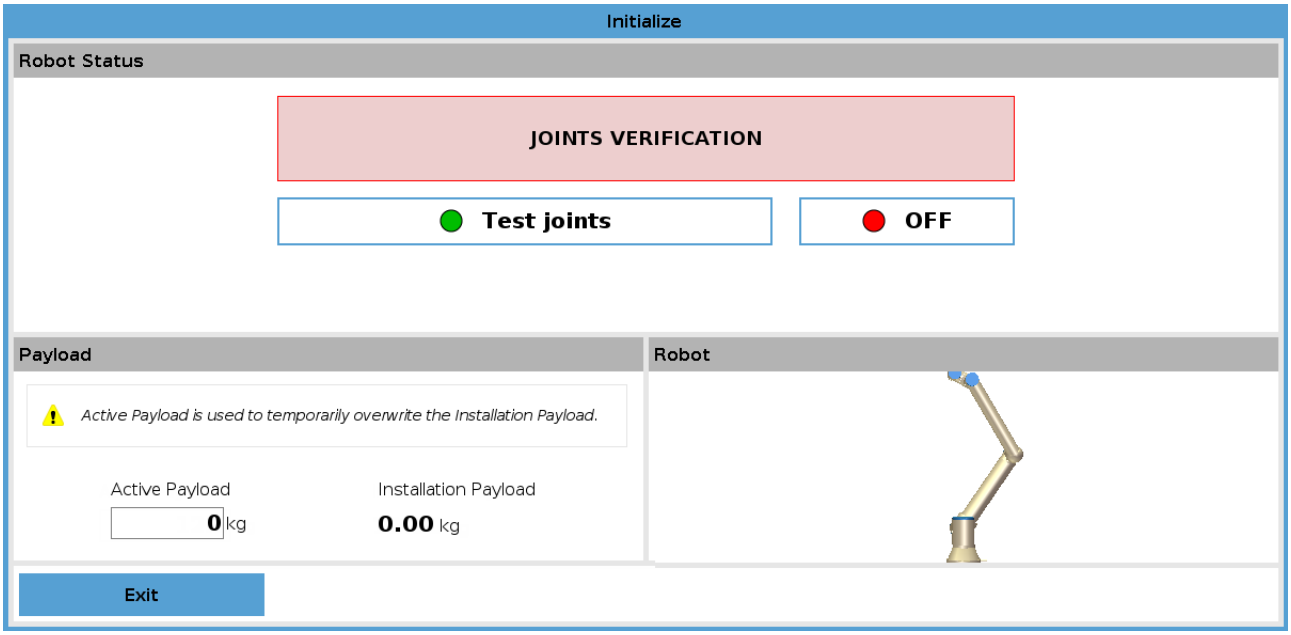


2. A popup appears saying that joints need verification. Confirm the popup message by pressing Check

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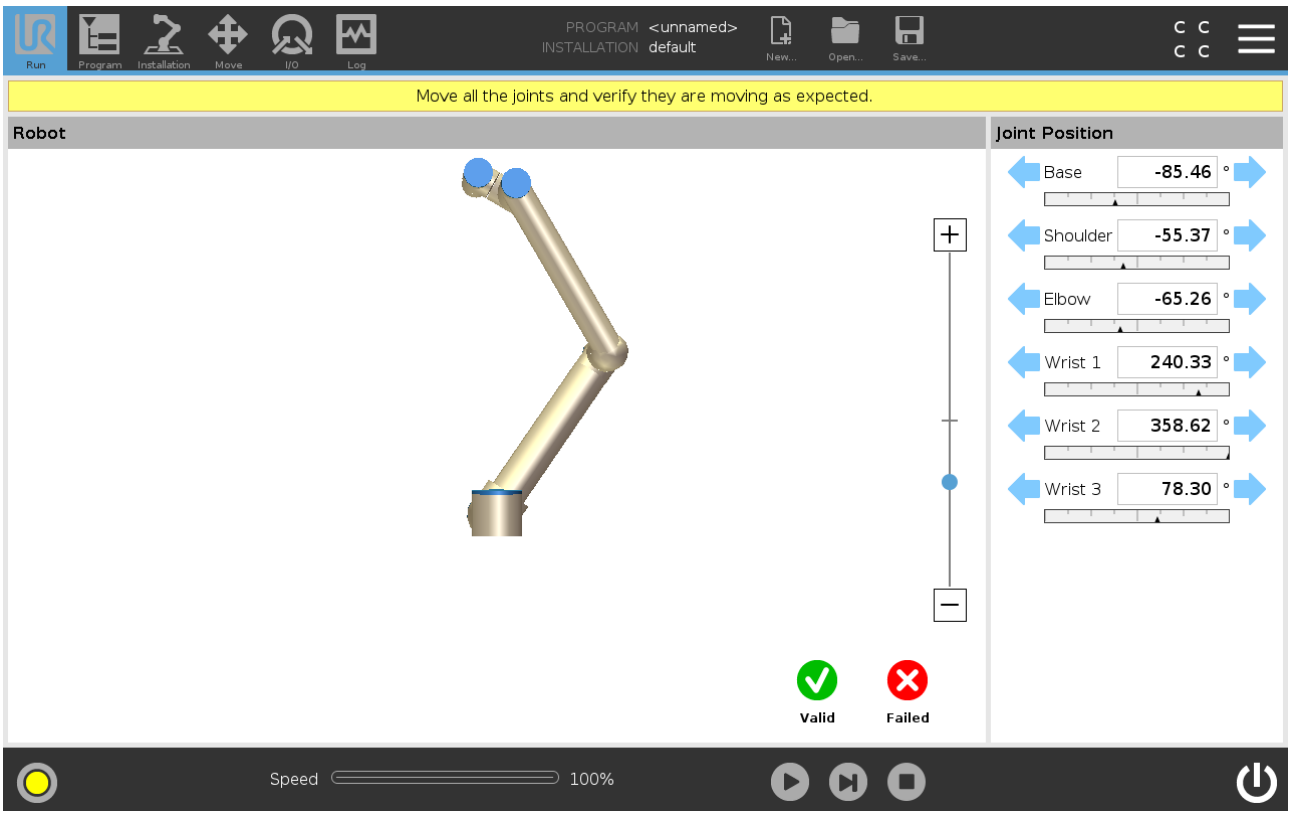


3. Press Test Joints to start joint verification.



4. Move all joints with the arrows respective to each joint.
    1. If joints move as expected, press Valid and a popup appears. Follow the popup instructions.
    2. If joints did not move as expected (i.e., wrong joint moves or incorrect direction), press Failed and a popup appears. Follow the popup instructions.

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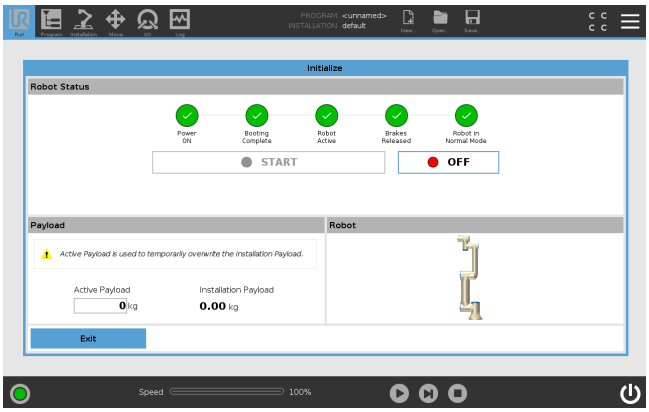
4.2.11. Zeroing of Joints

When a joint has been replaced and verified it may be necessary to zero the joint so that it is aligned with the rest of the robot arm. There are two ways this can be done.

- Automatically - Dual robot calibration – this is recommended method as it is done via controlled procedure and removes human errors. Please consult Calibration manual for this process.
- Manually - Access Expert mode and use a spirit level, to level the joint.

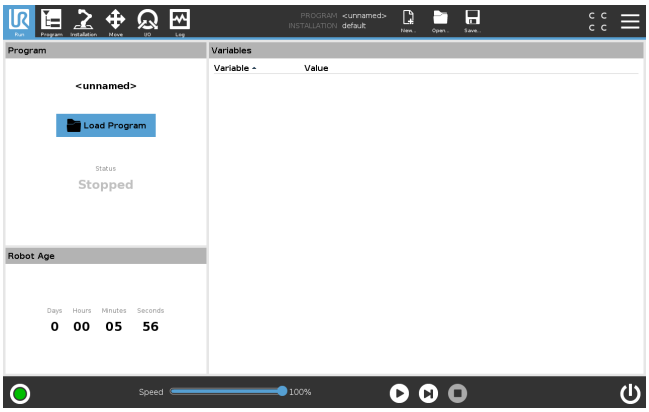
The following step guides how to zero the joint(s) manually.

1. Power on the robot and ensure the brakes are released.

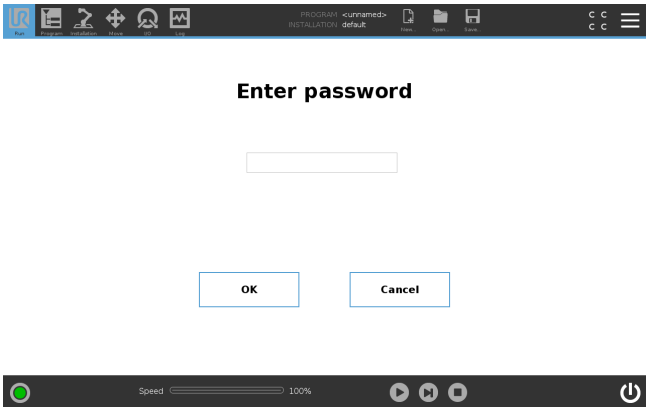


2. Press and hold the UR logo for approximately 5 seconds. The screen will change.

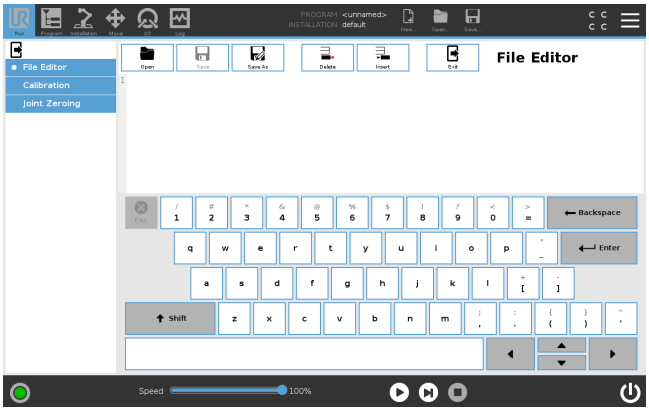
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3. Press the gray box and type the password **lightbot** and press OK



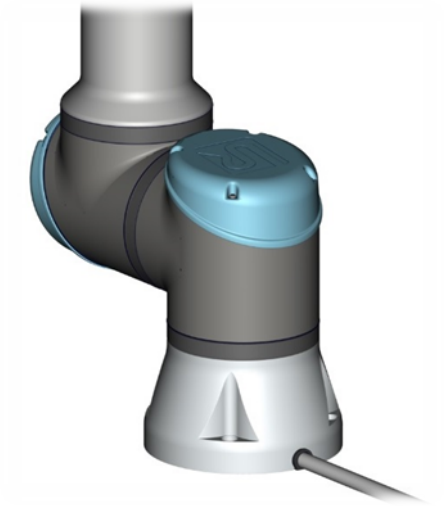
4. Select Joint Zeroing in the menu to the left.



5. Use the arrows in the Joint Position window on the right side of the screen to move each joint to align as shown in the images below. The Speed Slider can be used to reduce the speed of movement.

Base Shoulder, Elbow, Wrist 1

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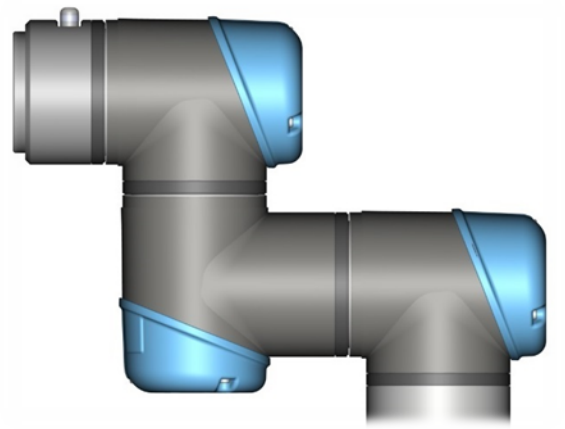




Base zero position is aligned so the Base joint is offset 180 degrees from the cable at the back of the robot base.

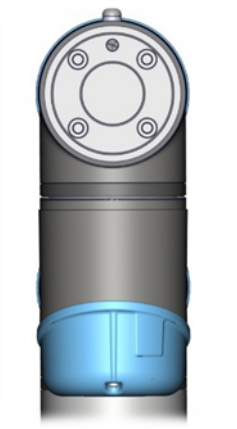
Shoulder, Elbow and Wrist 1 zero output flange vertically align (assuming Base is horizontal). Make sure that Base of the robot is horizontal, use spirit level to align joints.

Wrist 2



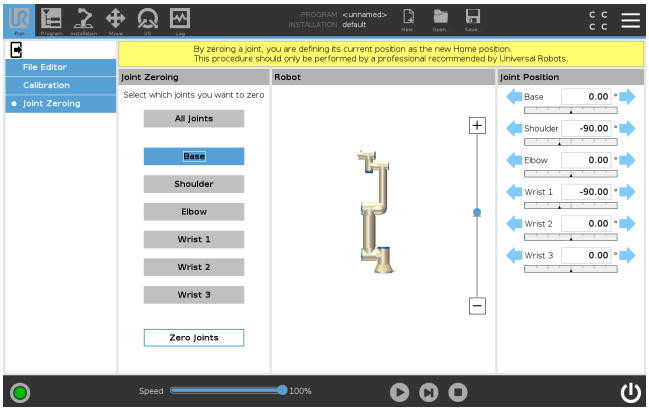
Wrist 2 zero position is aligned like the Base joint, with tool flange parallel with Wrist 1 output flange.

Wrist 3



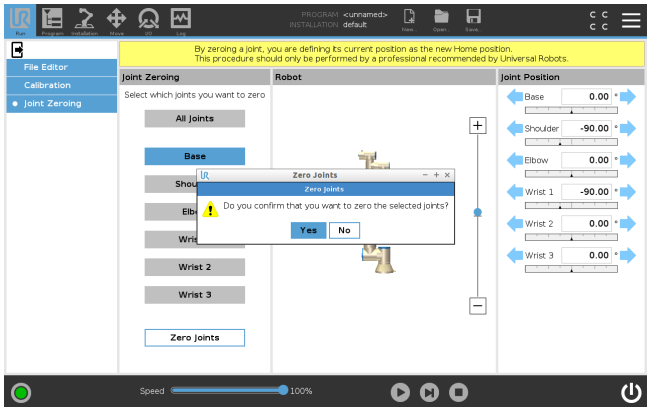
Wrist 3 zero position is aligned so the tool connector is pointing upward. Mount two bolts in tool holes and use spirit level to align joint.

6. In the Joint Zeroing window select the joint you want to zero. When selected the box will change from gray to blue. Press Zero Joints

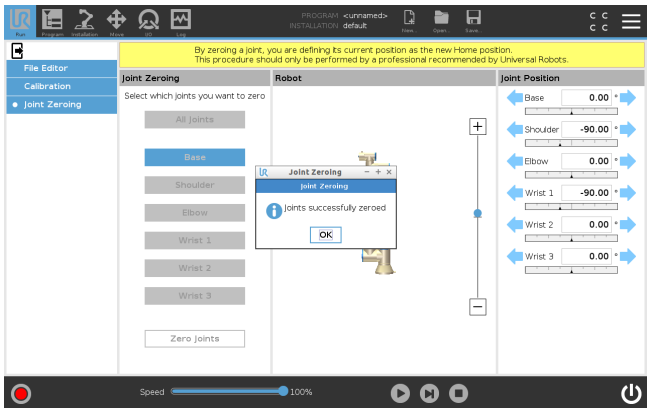


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7. Confirm you want to zero the joint. The robot will power down after confirmation.



8. A popup shows to confirm that the joint(s) has now been zeroed. Press OK to close the popup and return it to normal.



4.2.12. Dual Robot Calibration

Dual Robot Calibration calibrates the robot in the full work space. Each new robot is Dual Robot Calibrated as part of final assembly.

NOTICE

If a joint is replaced on a calibrated robot the calibration is no longer valid.

Performing a Dual Robot Calibration after replacement of a joint allows the robot to continue in the production line without modifying waypoints in the robot program.

To perform a Dual Robot Calibration, you need:

- 2 robots (same size and same generation)
- Dual Robot Calibration Tooling Complete (Part no: 185500)

You can download the Calibration Manual from the Universal Robots Support site www.universal-robots.com/support/

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4.2.13. Program Correction by Key Waypoints

Program Correction by Key Waypoints helps adjusting programs waypoints when a program is moved from an uncalibrated robot to another. The technique can also be used to make programs work after replacements of joints.

Please refer to the Calibration Manual from the Universal Robots Support site www.universal-robots.com/support/ for detailed description on how to use this feature.

NOTICE

Program Correction by Key Waypoints does not currently support the following:
- Other types of waypoints with the exception fixed waypoints.
- Move node with Use Joint Angles selected.

The unsupported program nodes above may need to be corrected manually after the Program Correction by Key Waypoints process is complete.

4.3. Robot Cable

4.3.1. Replacing Robot Cable

CAUTION

The maximum robot connection from the robot arm to the Control Box is 12 m. Improper robot connection can result in loss of power to the robot arm.

- Do not extend a 6 m.

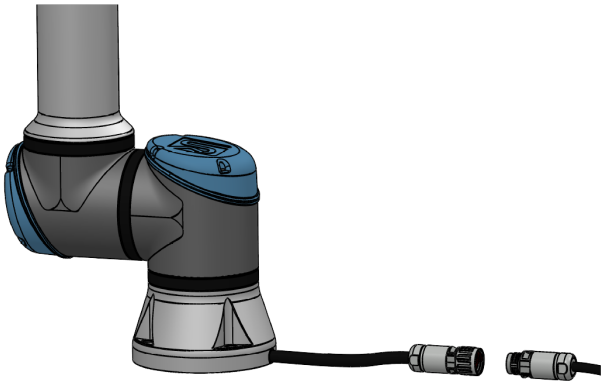
NOTICE

Connecting the Base Flange Cable directly to any Control Box can result in equipments or property damage.

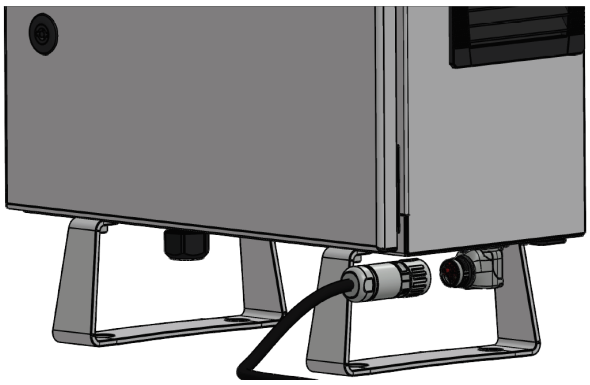
- Do not connect the Base Flange Cable directly to the Control Box.

1. On the base of the robot arm, locate the robot connection and twist it to the Open position.
2. Pull the robot connection apart to separate the Robot Cable from the Base Flange Cable.
3. On the Control Box, locate the robot connection cable and twist it to the Open position.
4. Pull the robot connection apart to separate the Robot Cable from the Control Box connector.
5. Connect the new Robot Cable to the Base Flange connector and twist to the Closed position.

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6. Connect the new Robot Cable to the Control Box connector and twist to the Closed position



4.4. Control Box

4.4.1. Dismantling the Control Box

WARNING

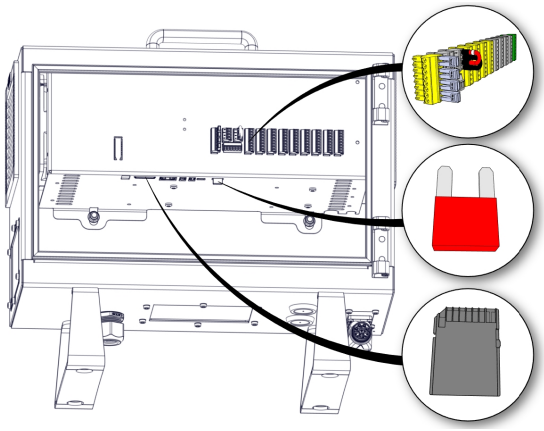
Before replacing ANY components inside the Control Box, you MUST do a complete shutdown.
Follow the first 3 steps in section Complete Rebooting Sequence

NOTICE

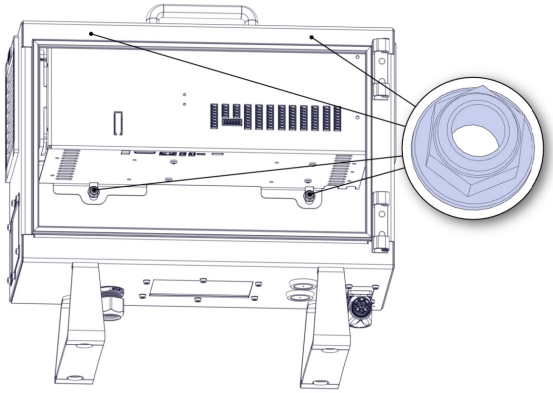
Exercise caution when handling ESD sensitive parts.
See section 2. Handling ESD-Sensitive Parts
If possible, lay the Control Box on its back.
Assembling is done in revers from the steps shown.

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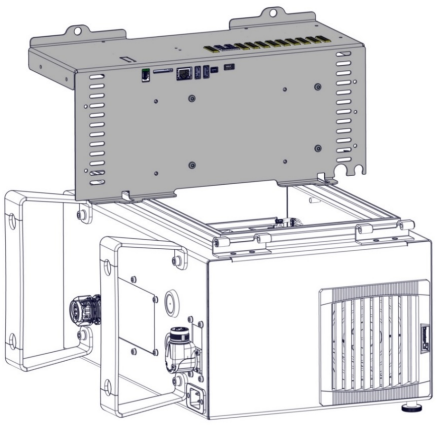
1. Power off Control Box - follow step 1 to 3 in section Complete Rebooting Sequence
2. Remove all the I/O Terminals, the Fuse, SD-card and any other I/O etc. that may be connected.



3. Remove the Teach Pendant, see Section 4.4.4. Replacing the Teach Pendant: Standard TP on page 53
4. Lay the Control Box on the backside and remove the four nuts.

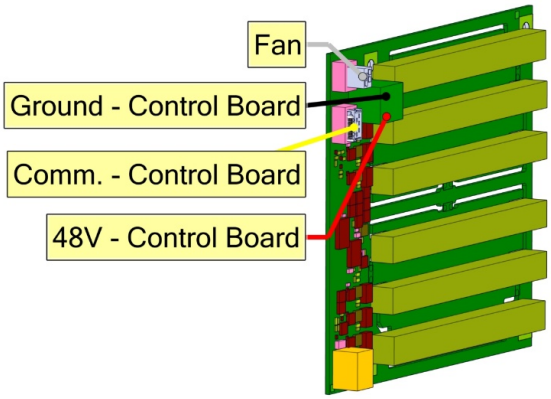


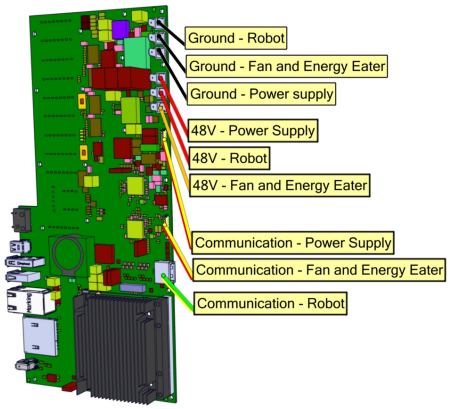
5. Take out the Control Box bracket and place it on the edge of the Control Box as shown below.



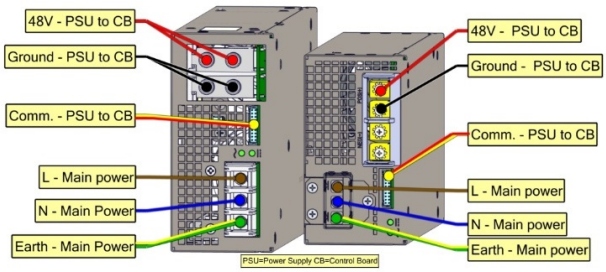
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6. Remove the wires connecting the Control Box bracket and the Control Box.
   Take note of the connections or consult the eletrical diagram in Section 7. Electrical drawings





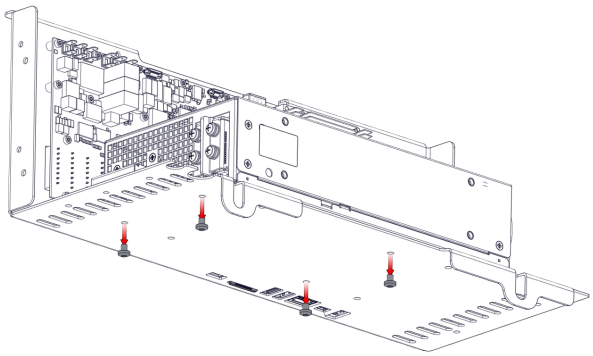
Power Supply

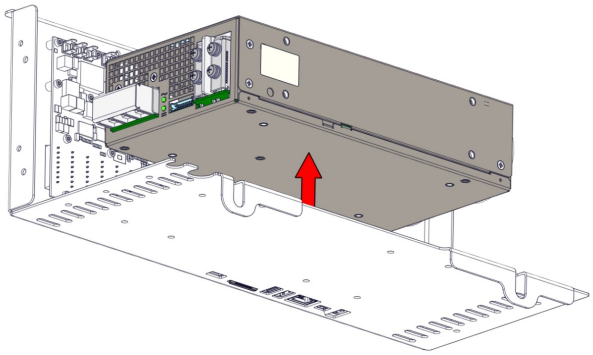


UR5e, UR10e and UR16e **UR3e**

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7. Remove the four screws on the bottom of the power supply, then remove the power supply.

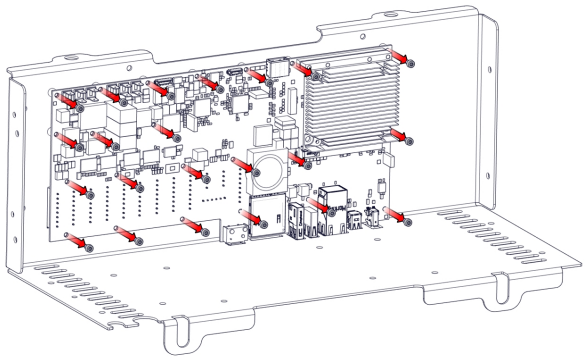




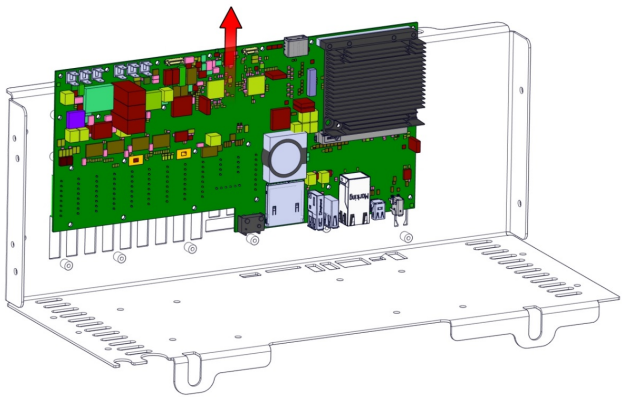
NOTICE

When assembling, the screws must not be tightened with a torque greater than 1.0 $^{+0.1}_{-0.1}$ Nm

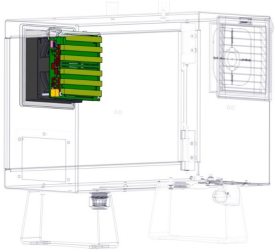
8. Remove the twenty-two screws and remove the Control Board upward.

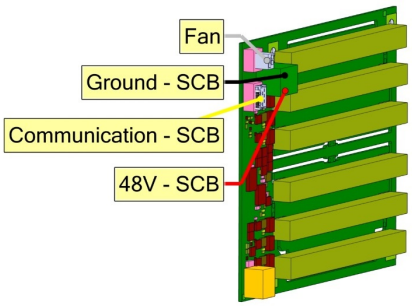


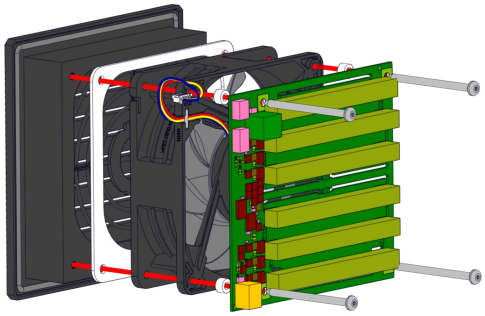
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9. Removing the Energy Eater and fan assembly. Remove the four screws.







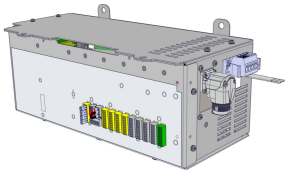
NOTICE

When assembling, remember to place the round spacers behind the Energy Eater board.

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4.4.2. Dismantling the OEM AC and DC Control Box

The OEM AC and DC version are special Control Box units made for OEM installation in AC and DC environments.



WARNING

Before replacing ANY components inside the Control Box, you MUST do a complete shutdown.
Follow the first 3 steps in section Complete Rebooting Sequence

NOTICE

Exercise caution when handling ESD sensitive parts.
See section 2. Handling ESD-Sensitive Parts
If possible, lay the Control Box on its back.
Assembling is done in revers from the steps shown.

OEM DC Control Box Special Precautions

WARNING

In case of a battery failure, (for example, due to a short circuit) the current can cause fire or explosion. To avoid injury while performing service:
Wear safety glasses.
Wear fireproof protective gloves.
Do not perform service or maintenance work on the OEM DC Control Box if a circuit breaker, or a power switch and a fuse are not installed.
Ensure that the circuit breaker or the power switch is off and there is no voltage on the power connector before connecting or disconnecting the connector.

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NOTICE

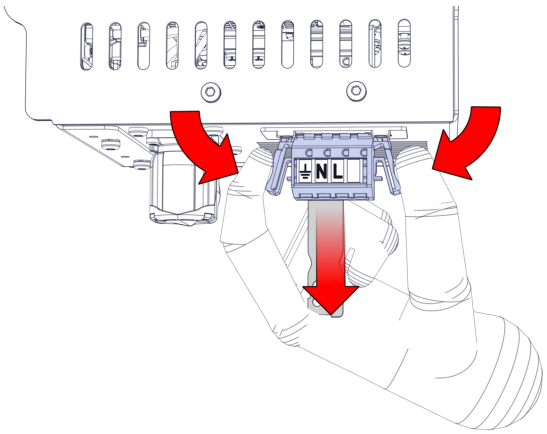
Since the control box does not have the reverse polarity protection, reversing the DC source polarity causes permanent damage to the control box. Such damage requires the replacement of the DC-DC PSU. To ensure that the polarity of the power source wiring is correct:

Doublecheck the polarity of wires in the power connector using a multimeter. Do not rely on the wire colors unless you have access to the battery terminals and can see where the wires are connected.

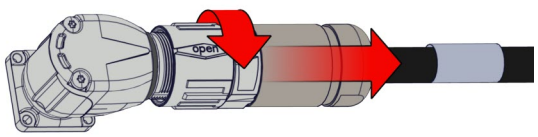
Ensure that the wires are installed correctly in the connector terminals. Ensure that:
Wires are not loose.
Wires are fully inserted in terminals.
Ensure that the control box is grounded properly. For information on grounding, see the OEM Control Box Installation Guide.
Ensure that the wires in the power connector can sustain the short circuit cut-off current of the circuit breaker or fuse. For example, an AWG12 wire is rated up to 34A, so the cut-off current of the protective device must be at least 34A or lower to protect the wire and the system.

Dismantling the OEM AC and DC Control Box

1. Follow step 1 and 2 as described in Dismantling the Control Box
2. Remove main power connection by pushing in on the two clips and pull backwards.



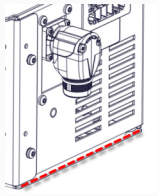
3. Remove robot cable by unscrew the top part clock-vise then pull the plug out.



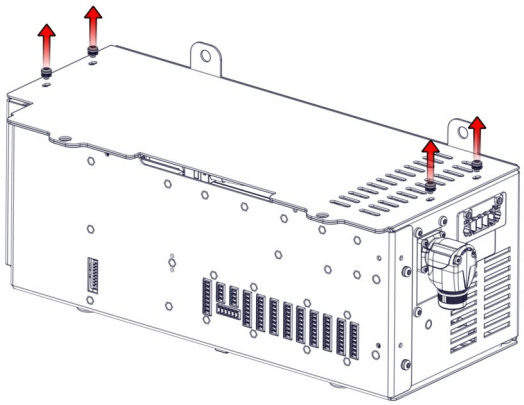
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CAUTION

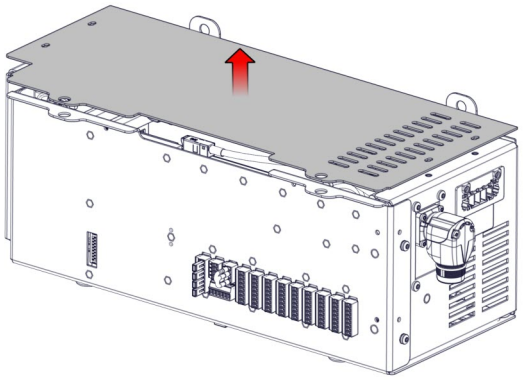
When pulling the robot arm cable connector, be careful not to scrape your hand/fingers on the frame edge.



4. Remove the OEM Control Box from its installation and place it on a table or similar.
5. Remove the 4 screws(T20) shown below, remember the washers as well.

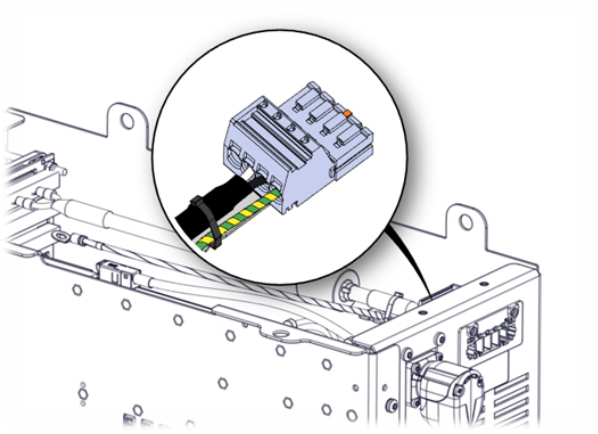


6. Remove the top lid.

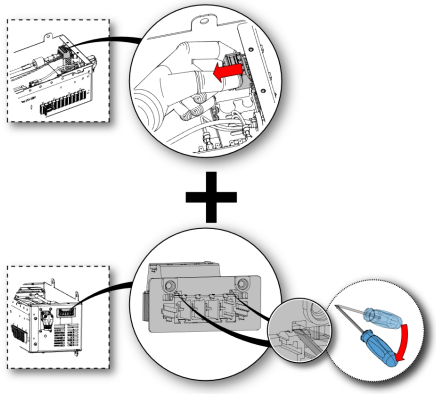


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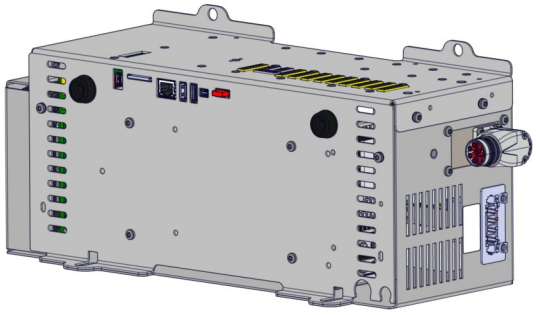
7. Now the power plug on the inside needs to be disconnected from the frame, how to do this correctly is shown in Step 8.



8. For removing the power plug, you will need a small 2mm flathead screwdriver. Pull in the power plug AND tip the two front locks upwards at the same time

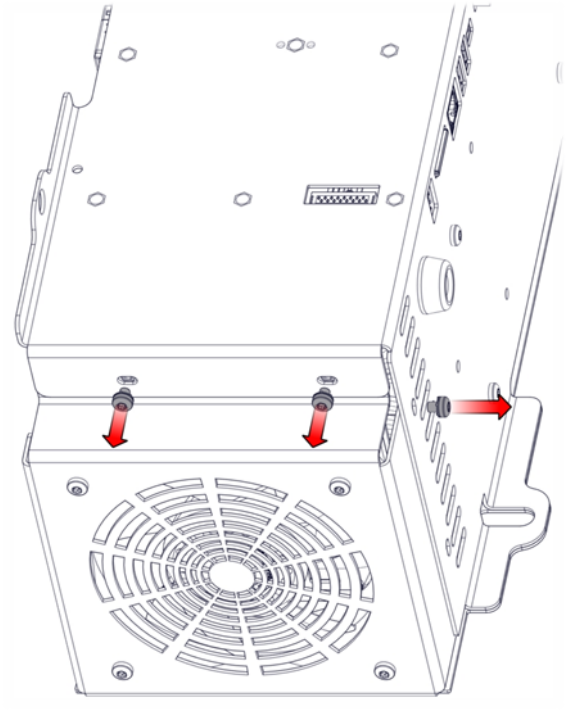


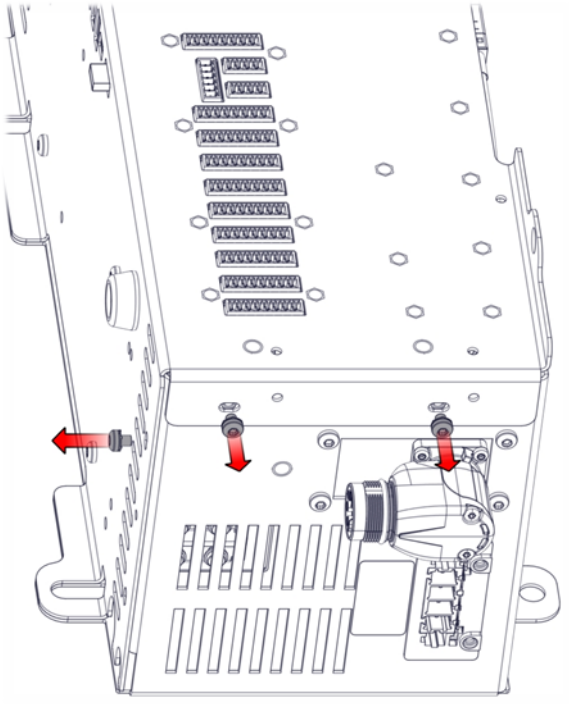
9. Remove all connections to the Control Board.
10. Lay the Control Box on the “back”



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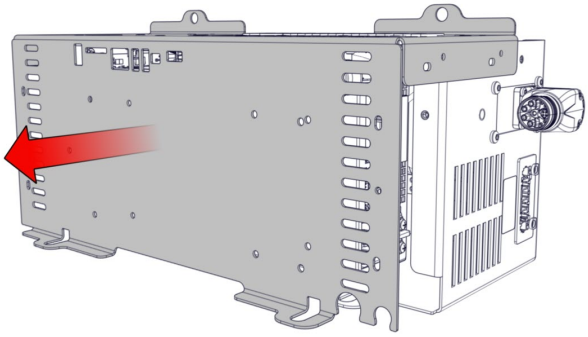
11. Remove the 6 screws(T20) shown below.



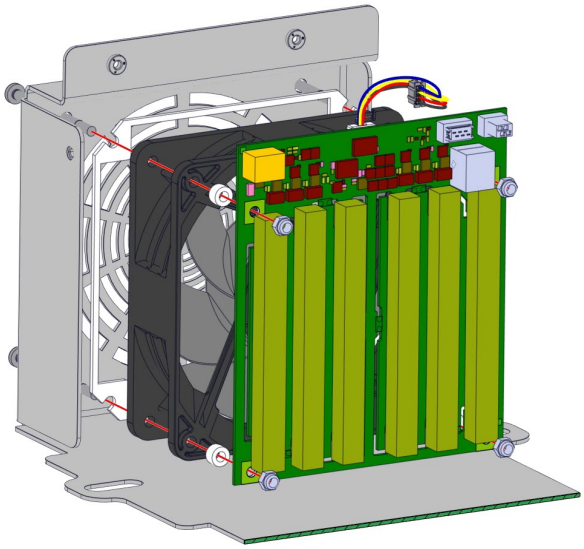


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12. Pull out the front part where the power supply and Control Board is attached.



13. There are now two possibilities:
    - Remove Power Supply and/or Control Board
    - See step 7 and 8 in section Dismantling the Control Box
      NOTE: Remember to cable tie the energy eater cable to the power cable when assembly the unit.
      - Remove Energy Eater and/or Fan
      See next step.
14. Remove the 4 nuts(7mm) on the Energy eater side and pull the individually part off the screws (T20).

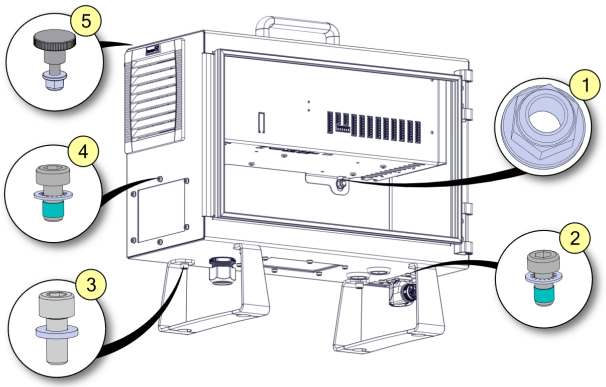


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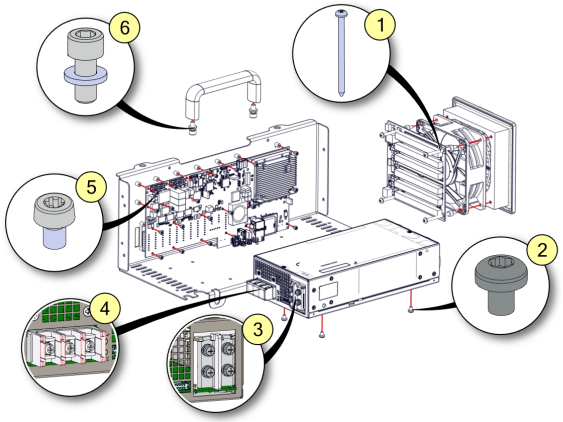
4.4.3. Torque Values

Torque values and notes for Control Box

Below are the torque values used in the Control Box.



NO.	DESCRIPTION	Tool size	Torque
1	Nut for internal CB bracket	10mm	2.25Nm
2	Robot connector screw	Torx T20	1.5Nm
3	Screw for feet bracket	Hex key 5	4.0Nm
4	Screw and washer for cover plate	Torx T20	1.5Nm
5	Control Box and Teach pendant mounting nut	10mm	2.25Nm



NO.	DESCRIPTION	Tool size	Torque
1	Screw for fan and energy eater assembly	Torx T20	0.6Nm
2	Screw for mounting power supply	Torx T20	1.0Nm
3	Internal power terminal screws	PZ2	1.2Nm
4	External power terminal screws	PZ2	1.2Nm
5	Control Board mounting screws	Torx T10	0.6Nm
6	Bolt for Control Box handle	Hex key 5	4.0Nm

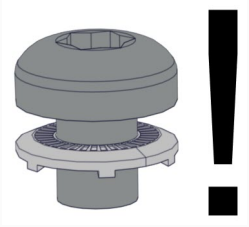
Torque values and notes for OEM AC and DC Control Box

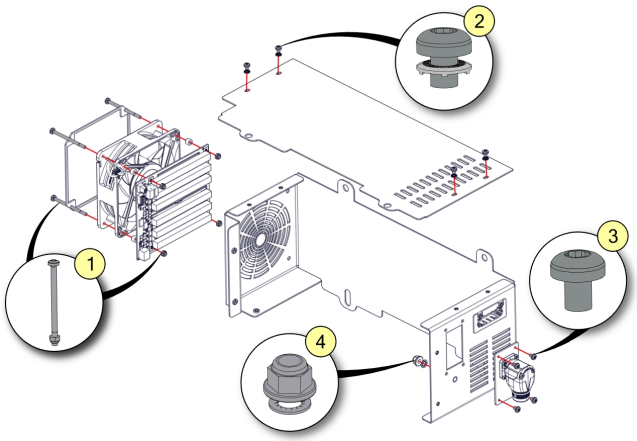
Below are the torque values used in the OEM AC and DC Control Box.

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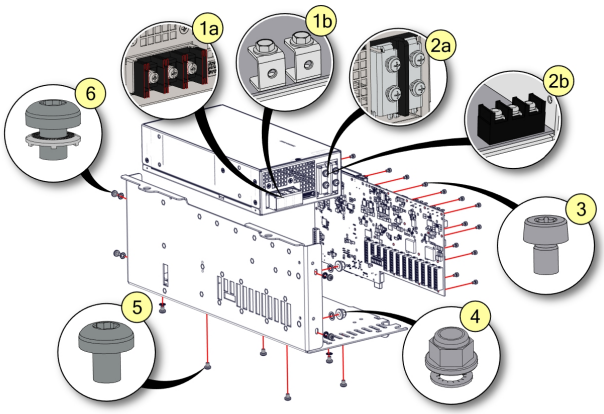
NOTICE

The washer, when present, need to have the spikes facing downwards.





NO.	DESCRIPTION	Tool size	Torque
1	Bolt and nut for fan and energy eater	Torx T20/7mm	0.6Nm
2	Panel screw and washer	Torx T20	1.6Nm
3	Robot connector screw	Torx T20	1.6Nm
4	Shield connecting bold and washer	10mm	2.25Nm



NO.	DESCRIPTION	Tool size	Torque
1a	AC external power terminal screws	PZ2	1.2Nm

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1b	DC external power terminal bolts	8mm	1.6Nm
2a	AC internal power terminal screws	PZ2	1.2Nm
2b	DC internal power terminal screws	PZ2	1.6Nm
3	Control Board mounting screws	Torx T10	0.6Nm
4	Bolt and nut for fan and energy eater	10mm	2.25Nm
5	Power supply mounting screw	Torx T20	1.0Nm
6	Panel screw and washer	Torx T20	1.6Nm

4.4.4. Replacing the Teach Pendant: Standard TP

This section describes how to remove and replace a Standard Teach Pendant. For information on how to replace a Standard Teach Pendant with a 3PE Teach Pendant, see 4.4.5. Replacing the Teach Pendant: 3PE TP on the next page.

WARNING

When the Teach Pendant is replaced, test the E-stop button function.

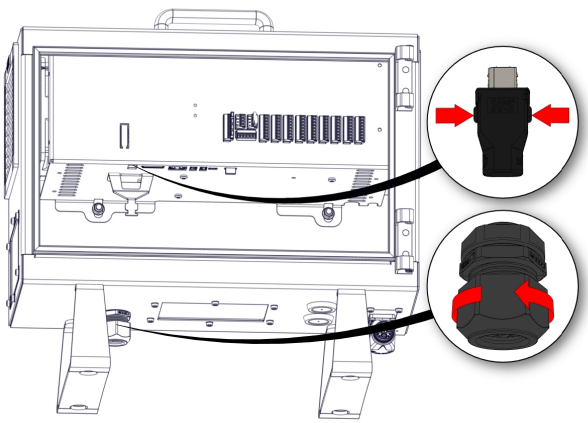
NOTICE

Replacing the Teach Pendant can result in the system reporting a fault on start-up.

- Always select the correct configuration for the type of Teach Pendant.

To remove:

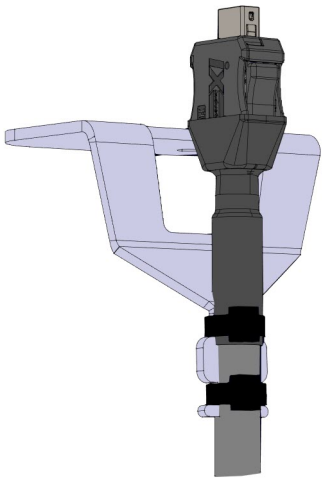
1. Power down the control box and disconnect the mains cable from the power source.
2. Remove and discard the two cable ties used for mounting the Teach Pendant cables.
3. Press in the clips on both sides of the Teach Pendant plug, as illustrated below, and pull down to disconnect from the Teach Pendant port.
4. Fully open/loosen the plastic grommet at the bottom of the control box and remove the Teach Pendant plug and cable.
5. Gently remove the Teach Pendant cable and Teach Pendant.



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To replace:

1. Place the Teach Pendant plug and cable in through the bottom of the Control Box and fully close/tighten the plastic grommet.
2. Push the Teach Pendant plug into the Teach Pendant port to connect.
3. Use two new cable ties to mount the Teach Pendant cables.
4. Connect the main power cable to the power source and power on the Control Box.



4.4.5. Replacing the Teach Pendant: 3PE TP

This section describes how to replace a Standard Teach Pendant with a 3PE Teach Pendant. For information on how to remove and replace a Standard Teach Pendant, see 4.4.4. Replacing the Teach Pendant: Standard TP on the previous page.

WARNING

When the Teach Pendant is replaced, test the function of the 3PE buttons.

NOTICE

Replacing the Teach Pendant can result in the system reporting a fault on start-up.

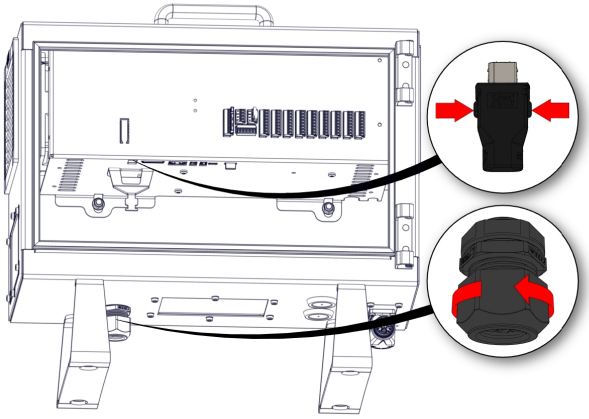
- Always select the correct configuration for the type of Teach Pendant.

To remove:

1. Power down the control box and disconnect the main power cable from the power source.
2. Remove and discard the two cable ties used for mounting the Teach Pendant cables.
3. Press in the clips on both sides of the Teach Pendant plug, as illustrated, and pull down to disconnect from the Teach Pendant port.

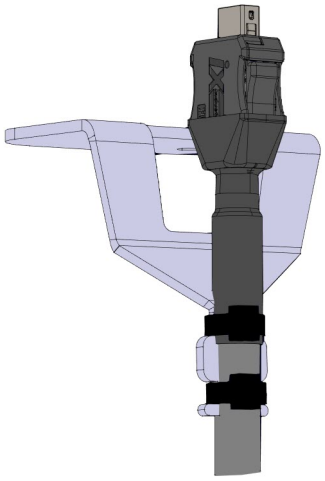
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4. Fully open/loosen the plastic grommet at the bottom of the Control Box and remove the Teach Pendant plug and cable.
5. Gently remove the Teach Pendant cable and Teach Pendant.



To replace:

1. Place the 3PE Teach Pendant plug and cable in through the bottom of the control box and fully close/tighten the plastic grommet.
2. Push the 3PE Teach Pendant plug into the Teach Pendant port to connect.
3. Use two new cable ties to mount the 3PE Teach Pendant cables.
4. Connect the main power cable to the power source and power on the Control Box.



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5. Software

5.1. Software Updates

Universal Robots software is called PolyScope.



CAUTION

Read these instructions and the instructions on our support website (www.universal-robots.com/support) completely prior to updating your software. Universal Robots assumes no responsibility for failed updates caused by improper operation.
Control Box power MUST NOT be turned off during the software update process. Failure to meet this demand is likely to cause loss of data and malfunction.
Keeping the robot software up to date is required to ensure safe operation. Also, the latest software provides more features and a better performance.
Read the Release Notes of the software you install. Release Notes hold notes about the software changes which in some cases are relevant for safe operation of the robot. Updating the software may cause changes to functionality. Robot motions might change or be subjected to different restrictions.
In case of questions or concerns related to your application please contact your supplier for advice and assistance.

Not all combinations of updates are possible. These are the rules to observe:

- If running **PolyScope 5.5.0 and above**:
  Update directly to PolyScope 5.8.0 or any later version.
- If running **PolyScope 5.4.3 and below**:
  Updates must be done incrementally in steps of one minor version.
  E.g. PolyScope 5.2.1 à 5.3.1 à 5.4.3 à 5.5.1.
  When PolyScope 5.5.0 is reached, software can be updated directly to the latest version.

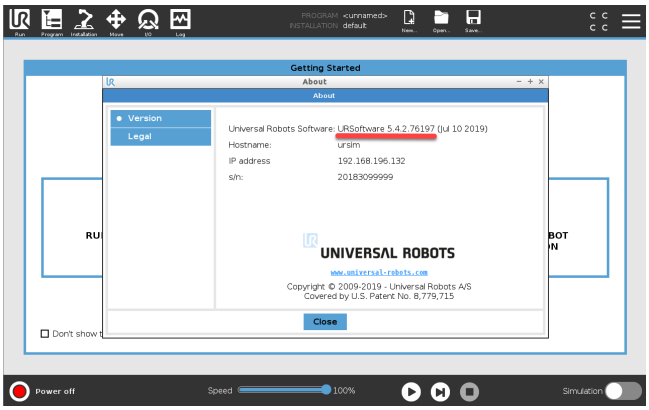
Therefore, when updating your robot software care must be taken to select a proper update path. Several update steps will be necessary until reaching a version of 5.5.0.

Downgrading software is not supported. In PolyScope 5.5.0 backup and restore functionality is added and this is the recommended way to go back to any prior version installed. We strongly recommend that you precede any update cycle with a backup to counter the situation of a failing update. Please contact your supplier if updating causes any trouble.

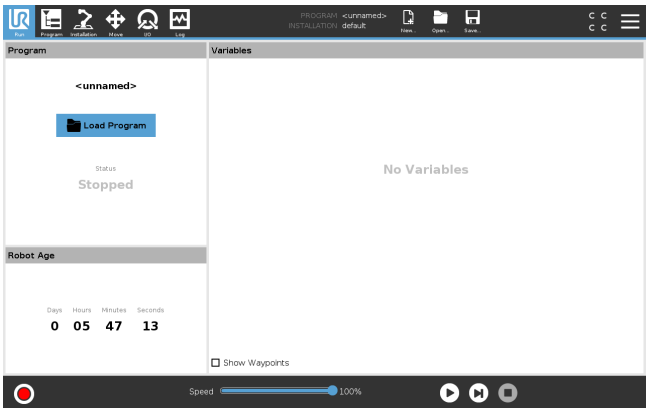
5.1.1. Update Procedure

1. On your robot, go to About and check your current software version.

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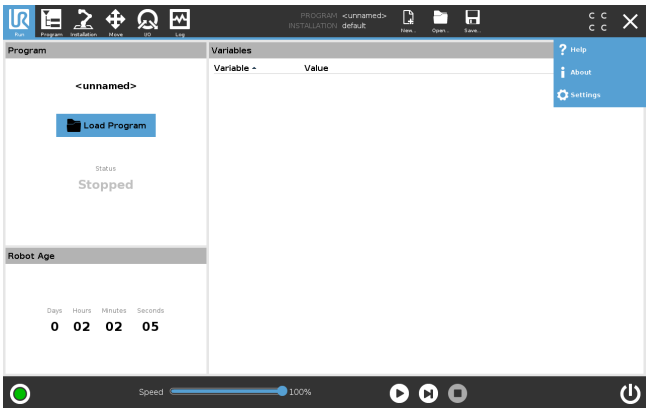


2. Download to your computer the software versions needed to be installed, you can download from Universal Robot's website (www.universal-robots.com/support).
    - If your SW is below 5.5 (E.g.: 5.3), you will need to incrementally update until you reach 5.5 (E.g.: 5.3 to 5.4, then 5.4 to 5.5), after updating to software 5.5 you can download the most up to date software and go straight from 5.5 to this last update (E.g.: 5.5 to 5.8).
    - If your SW is equal or above 5.5, just download the most updated software version file and install it straight from your current software version (E.g: 5.5 to 5.8).
3. Download the software version(s) needed to update your software and save file(s) in the root of a USB stick on your computer.
4. On the top right side of the Teach Pendant, insert the USB stick into the USB connector.
5. On teach pendant screen, press the right top corner icon  to access the settings menu.

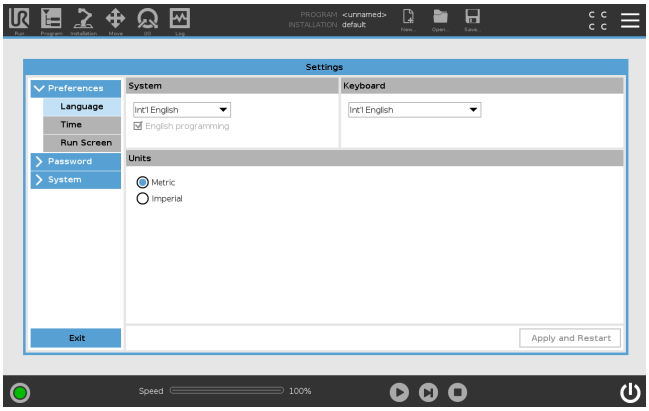


6. Press Settings to access the settings menu.

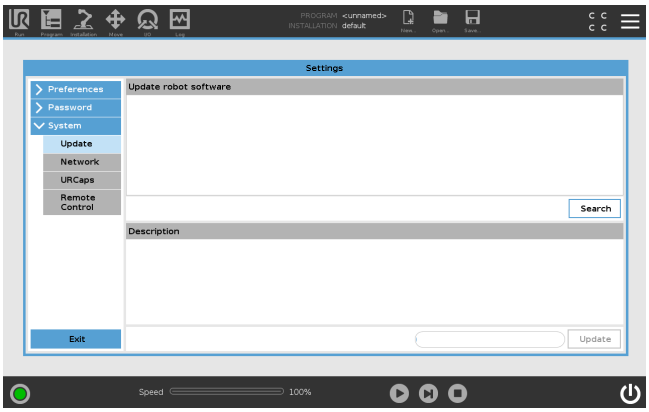
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7. On the left side menu, select System.

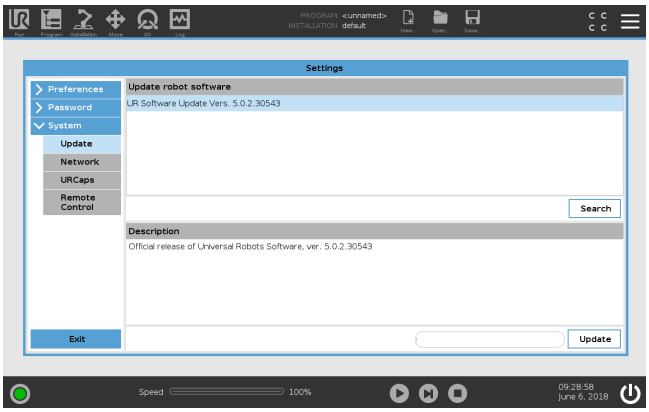


8. Press Update, then Search to locate software update on USB stick.

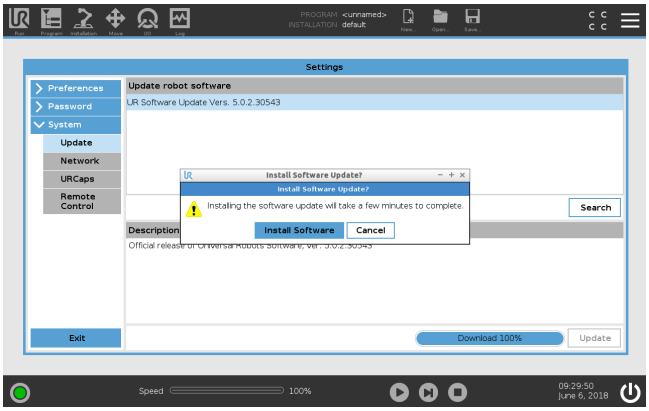


9. Select the desired software update and press Update.

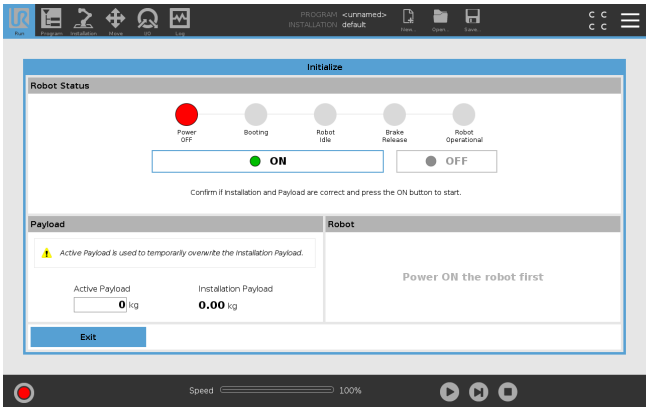
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10. Press Install Software to update the software.



11. The robot will power off and power on again. Once the update is complete, the Control Box automatically reboots. **Do not power off or unplug the robot from the outlet during startup.**
12. Wait until the reboot is complete. Firmware for the control Box and Tech Pendant is updated.
13. When complete, go to the Initialize screen and press ON, if available joint firmware is going to update.



14. Remove the USB stick.
15. If it is the case, repeat steps 4. To 14. until reaching the most updated version.
    - Note: From software version 5.5 beyond, the most updated version available in UR's website can be installed direct, no need to incrementally install updates.

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More info is displayed on release notes on support site. Read it for new features releases and improvements.

5.1.2. Update timeline

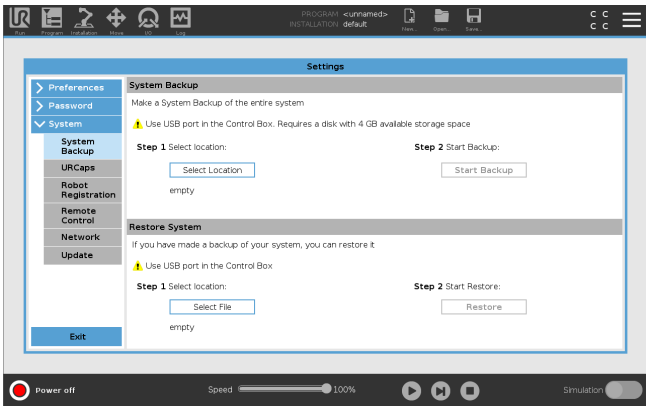


- If your software version is one of the yellow sections, you need to install incrementally until 5.5.
- If your software version is one of the blue sections, you can update direct to any green version.
- If your software version is one of the green sections, you can update direct to any green version.

5.1.3. Downgrading vs. Restoring system backup

Do not downgrade the robot software to an earlier version than the version the robot was manufactured.

Do not revert your robot software using older update packages if you have software version equal or above 5.8 installed. If for any reason, you need to downgrade below PolyScope version 5.8, you can do so by restoring your old system backup (system backup was implemented from Polyscope version 5.5 ahead).



NOTE

The system backup requires around 4Gb memory, please use a USB stick of 4Gb or more capacity.

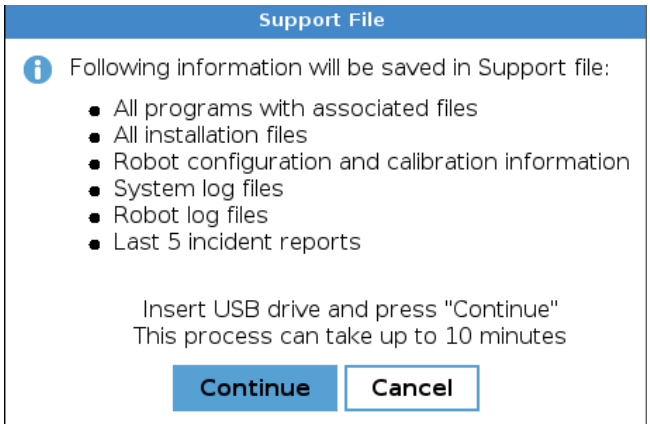
NOTICE

Always perform program and installation files backup before updating the software.

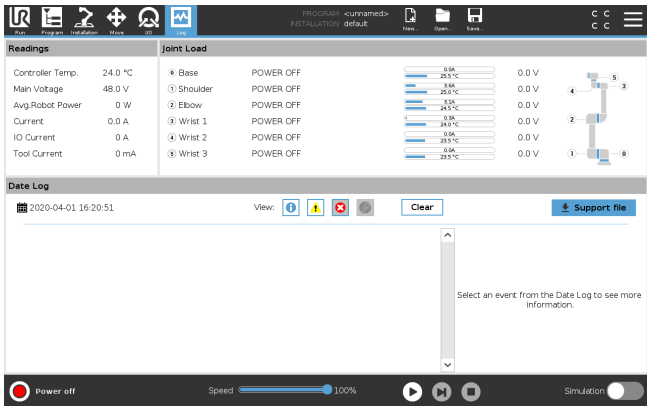
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5.2. Using Support File

For easy backup, Universal Robots provides a feature available from software version equal or above 5.8 called Support File, an automatically copy of the robot data from Control Box to the USB stick.



1. Go to Log tab, insert a USB stick and click on Support File.



NOTE

This backup requires around 1Gb memory, please use a USB stick of 2Gb or more capacity.

NOTICE

Always perform program and installation files backup before updating the software.

5.3. Using Magic Files

For easy backup, Universal Robots provides Magic Files to automatically copy data from Control Box to USB stick. Magic files backup works with all software versions.

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NOTICE

Always perform program and installation files backup before updating the software.

Available file	Function
URmagic log file	Copies the entire log history file to USB stick
URmagic backup programs	Copies all programs and installation files to USB stick
URmagic configuration files	Copies all configuration files to USB stick
URmagic upload programs	Copies all programs and installation files **from** a USB-stick to the robot
URmagic screenshot	Generates a screenshot of GUI when USB stick is inserted

You can download Magic Files at: www.universal-robots.com/support

5.3.1. Using Magic Files

1. Download and save Magic Files to the root folder on a USB stick. If more than one Magic File is on the USB stick, they run in sequence. Warnings appear for each file. Do not remove the USB stick until the last file has finished. Multiple folders are created and named with serial number as well as a sequence number (e.g., 201855xxxx_0, 201855xxxx_1).
2. Insert a USB stick into the USB connector located on the top right side of the Teach Pendant.
3. A red !USB!-sign appears on the screen. Do not remove the USB stick.
4. Wait for a green <-USB-sign to appear. If more than one Magic File is on the USB stick, proceed to Step 3. NOTE: Large files (e.g., history log) may take up to 2 minutes to download.
5. After the last Magic File is completed the USB stick can be safely removed.

The Magic File creates a folder on the USB stick named with the serial number of the robot.

5.4. Backup of data

NOTICE

When copying/moving files and folders, incorrect use might corrupt the file system. Contact your IT professional for assistance if you are not comfortable with this procedure.

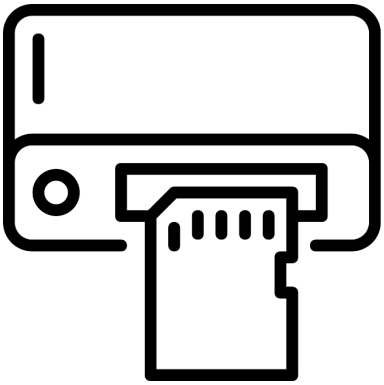
This section explains the process of moving required files during a robot backup.

5.4.1. Hardware Requirements

The following hardware is needed:

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- SD Card (Universal Robots 4GB Industrial grade SD card)
- A standard SD card reader



5.4.2. Software Requirements

When using Windows operation system, to read a Linux partition a software file system driver is required; in this example we are using “Linux File Systems for Windows” by Paragon but other Windows Linux reader can be used as well (these are however not tested by Universal Robots).

NOTICE

"Linux File Systems for Windows” by Paragon software is a third-party software. Universal Robot take no responsibility for this software.

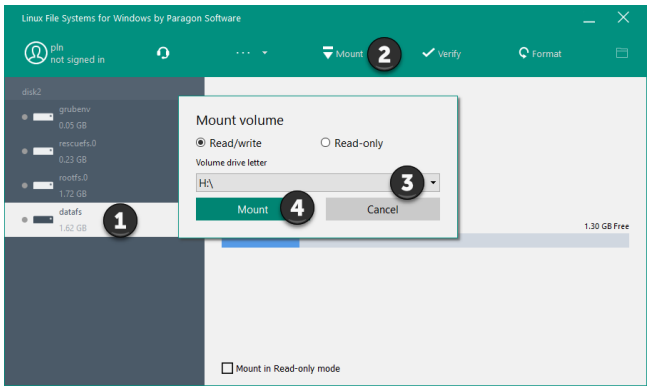
5.4.3. How to Access Linux Partition from Windows

With the software from Paragon you can access all partitions on the SD-card.

The files needed are located on the partition called **datafs**

If the partition is not shown, it could be it is not mounted automatically.

To correct this, open the Paragon software, select the partition (1), select the Mount icon (2), select the Volume drive letter (3) then Mount (4).



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5.4.4. Copy the data from SD card

Navigate to the SD card partition called **datafs** and copy the below listed files/folders.



NOTICE

Do not alter any files. You must only take backup copies as needed.

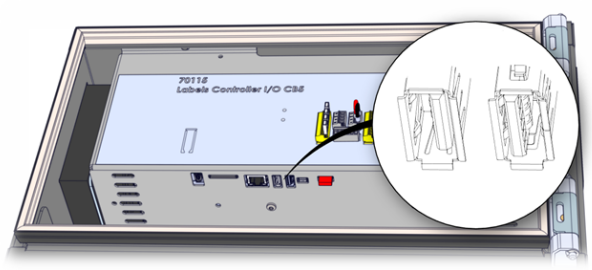
- programs/ [all of the following files: .urp, .txt, .script, .installation, .variable, .old]
- root/ur-serial
- root/log_history.txt
- root/log_history.bak [if existing]
- root/histogram.properties
- root/flightreports [Complete folder if existing]
- root/.urcontrol/calibration.conf
- root/.urcontrol/calibration.log
- root/.urcontrol/robot_calibration_summary.txt

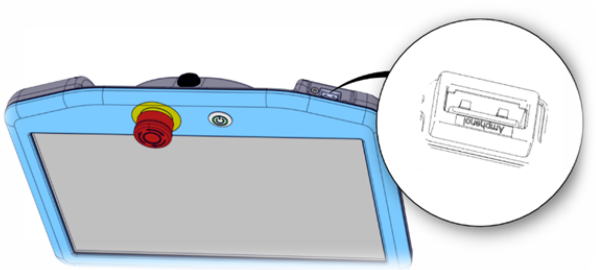
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6. Troubleshooting

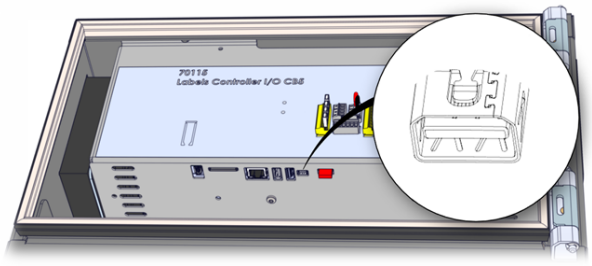
6.1. Adding External Equipment for Troubleshooting Purpose

For troubleshooting it can be useful to add a mouse, keyboard or monitor.
Most USB mouse and keyboards are supported. Plug in the mouse or keyboard in one of the available USB ports. It may be required to restart the Control Box for it to work.





In the Control Box, a Mini Display Port is available. When a monitor is connected, it will display the same contend as the Teach Pendant and can be connected at the same time as the Tech Pendant.
It may be required to restart the Control Box for it to work.

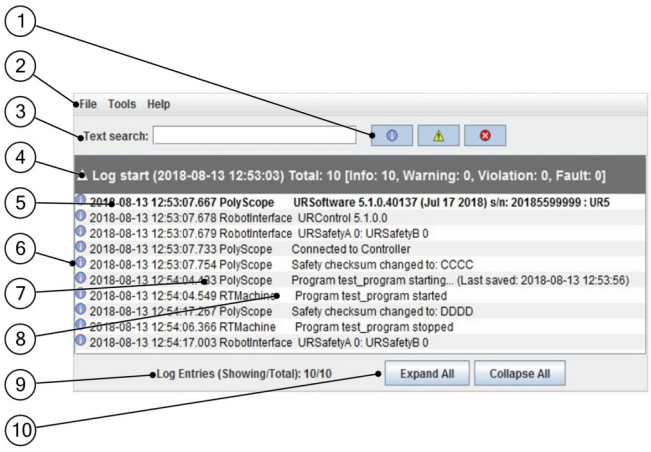


6.2. Support Log Reader (SLR)

Open log files with the Universal Robots Support Log Reader (SLR).

Go to www.universal-robots.com/support to download the Support Log Reader

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1. Filter;
   Select what filter to activate

   Info filter:

   Warning filter:

   Error filter:
2. Tool bar;
   Load log files, export error codes, change language
3. Text search;
   Type error code or text
4. Log start Info bar*;
   Created every time the robot is powered on.
5. Highlighted text;
   When tapped, gives more detailed Information.
6. PolyScope time
7. Reporter;
   Where the info is reported from ”safety, PolyScope, etc.”
8. Message;
   Text with the Cxxxx refers to the error codes.
9. Log Entries;
   Shown and total
10. Expand or collapse all Info bars (point 4)

NOTE

After loading the log file every Log Start Info Bar (4) is collapsed and only the summary for each log start is visible.

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6.3. Error codes

- On the Safety Control Board: Processor A = A uP = SafetySys1
- On the Safety Control Board: Processor B = B uP = SafetySys2
- PSU = Power Supply
- PC = Controller
- LVD = Low Voltage Detected

Error code	Description	Explanation	Suggestion
C0A	No error	Communication established	Log entry only, no issue
C1A1	Buffer of stored warnings overflowed		
C1A2	Outbuffer to RS485 overflowed (problem with Controller message)		
C2A	Inbuffer overflow		
C3A	Processor overloaded		Review program or remove some external controls and communications
C4A1	Lost communication with Controller	Communication is being interfered	a) Check Ethernet cable between Control Board and Motherboard, check that a script or UR+ software is not overloading the communication between the Control Board and Motherboard. b) Check cable between controller and robot b) Do a Complete rebooting sequence. c) Update the software
C4A2	Lost communication with Safety Control Board A uP		a) Check TCP/IP connection between Motherboard and Control Board. b) Do a Complete rebooting sequence. c) Replace Safety Control Board

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C4A3	Communication with Safety Control Board B uP lost		Same as C4A2
C4A4	Communication with primary Teach Pendant uP lost		a) Check RS485-12V connection between Motherboard and Teach Pendant. b) Do a Complete rebooting sequence. c) Replace Teach Pendant
C4A5	Communication with secondary Teach Pendant uP lost		Same as C4A4
C4A6	Communication with primary EUROMAP67 uP lost		a) Check Euromap67 connection between Motherboard and Teach Pendant. b) Do a Complete rebooting sequence. c) Replace Teach Pendant
C4A7	Communication with secondary EUROMAP67 uP lost		Same as C4A6
C4A8	Primary EUROMAP67 uP present, but euromap67 is disabled	Incorrect safety configuration	a) Update the miscellaneous settings in the Safety Configuration. b) Do a Complete rebooting sequence
C4A9	Secondary EUROMAP67 uP present, but euromap67 is disabled	Incorrect safety configuration	Same as C4A8
C4A10	Primary Teach Pendant present, but Teach Pendant safety is disabled	Incorrect safety configuration	Same as C4A8
C4A11	Secondary Teach Pendant uP present, Teach Pendant safety is disabled	Incorrect safety configuration	Same as C4A8

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C4A12	Communication with joint 0 lost	More than 1 package lost	a) Verify that the communication cables are connected properly. b) Do a Complete rebooting sequence
C4A13	Communication with joint 1 lost	More than 1 package lost	Same as C4A12
C4A14	Communication with joint 2 lost	More than 1 package lost	Same as C4A12
C4A15	Communication with joint 3 lost	More than 1 package lost	Same as C4A12
C4A16	Communication with joint 4 lost	More than 1 package lost	Same as C4A12
C4A17	Communication with joint 5 lost	More than 1 package lost	Same as C4A12
C4A18	Communication with tool lost	More than 1 package lost	Same as C4A12
C4A65	Lost package from Primary Teach Pendant	1 package lost	Same as C4A12
C4A66	Lost package from Secondary Teach Pendant	1 package lost	Same as C4A12
C4A67	Lost package from Primary Euromap67	1 package lost	Same as C4A12
C4A68	Lost package from Secondary Euromap67	1 package lost	Same as C4A12
C4A69	Lost package from Secondary Masterboard	1 package lost	Same as C4A12
C4A70	Lost package from joint 0	Serial communication problem with one or more joints	Same as C4A12
C4A71	Lost package from joint 1	Serial communication problem with one or more joints	Same as C4A12
C4A72	Lost package from joint 2	Serial communication problem with one or more joints	Same as C4A12

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C4A73	Lost package from joint 3	Serial communication problem with one or more joints	Same as C4A12
C4A74	Lost package from joint 4	Serial communication problem with one or more joints	Same as C4A12
C4A75	Lost package from joint 5	Serial communication problem with one or more joints	Same as C4A12
C4A76	Lost package from tool	Serial communication problem with one or more joints	Same as C4A12
C4A77	Lost package from uPA to joints	1 package lost	Same as C4A12
C4A78	Lost package from uPA to teach pendant	1 package lost	Same as C4A12
C4A79	Lost package from uPA to uPB	1 package lost	Same as C4A12
C4A80	Lost package from uPB	1 package lost	Same as C4A12
C4A81	Packet counter disagreement in packet from Primary Screen	Safety processor 1 in Teach Pendant has a packet disagreement	Same as C4A12
C4A82	Packet counter disagreement in packet from Secondary Screen	Safety processor 2 in Teach Pendant has a packet disagreement	Same as C4A12
C4A83	Packet counter disagreement in packet from Primary Euromap67	More than 1 package lost	Same as C4A12
C4A84	Packet counter disagreement in packet from Secondary Euromap67	More than 1 package lost	Same as C4A12
C4A85	Packet counter disagreement in packet from Safety Control Board B	More than 1 package lost	Same as C4A12

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C4A86	Packet counter disagreement in packet from joint 0	More than 1 package lost	Same as C4A12
C4A87	Packet counter disagreement in packet from joint 1	More than 1 package lost	Same as C4A12
C4A88	Packet counter disagreement in packet from joint 2	More than 1 package lost	Same as C4A12
C4A89	Packet counter disagreement in packet from joint 3	More than 1 package lost	Same as C4A12
C4A90	Packet counter disagreement in packet from joint 4	More than 1 package lost	Same as C4A12
C4A91	Packet counter disagreement in packet from joint 5	More than 1 package lost	Same as C4A12
C4A92	Packet counter disagreement in packet from tool	More than 1 package lost	Same as C4A12
C4A93	Packet counter disagreement in packet from processor A to joints	More than 1 package lost	Same as C4A12
C4A94	Packet counter disagreement in packet from processor A to B	More than 1 package lost	Same as C4A12
C4A95	Packet counter disagreement in packet from processor A to Teach Pendant and EUROMAP	More than 1 package lost	Same as C4A12
C4A100	Communication lost due to Packet counter disagreements	More than 1 package lost	Same as C4A12
C5A	Heavy processor load warning	Too much instructions being sent at the same time	Review communication frequency between robot and external equipment

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C10A	Controller communication issue		
C10A1	Lost packet from Controller		
C10A101	Controller packet received too early		
C10A102	Packet counter does not match		
C10A103	Controller is sending packets too often		
C11A	Bad CRC	Serial communication problem with joint	Check black 2-wire connectors and wires in joints
C12A	Unknown message error		
C14A1	Debug message		
C14A2	Debug message		
C14A3	Debug message		
C17A	Communication error between Safety Control Board and Motherboard		a) Check Ethernet connection between circuit boards b) Do a Complete rebooting sequence c) Update the software
C25A	Motor Encoder index missing	Joint's encoder system mechanical problem	a) Do a Complete rebooting sequence. b) If this happens more than two times in a row, replace joint c) Contact your local UR provider
C26A	Motor Encoder index drift detected	Joint's encoder system mechanical problem	a) Do a Complete rebooting sequence. b) If this happens more than two times in a row, replace joint c) Contact your local UR provider
C27A	Calibration data is invalid or does not exist.	Calibration needed	a) Do a Complete rebooting sequence. b) If this happens more than two times in a row, replace joint

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C29A	Online Calibration data checksum failed		a) Do a Complete rebooting sequence. b) If this happens more than two times in a row, replace joint
C30A	Master received data from too many joints		
C31A	Caught wrong message (not from master)	Serial communication problem with joint	Check black 2-wire connectors and wires on joints
C32A	Flash write verify failed		
C33A	Calibration flash checksum failed		
C34A	Program flash checksum failed		Update Firmware
C34A0	Program flash checksum failed during bootloading		Update Firmware
C34A1	Program flash checksum failed at runtime		Update Firmware
C35A	Joint ID is undefined		
C36A	Illegal bootloader command		
C37A	Inbuffer parse error	Serial communication problem with joint	Check black 2-wire connectors and wires on joints
C38A	Online RAM test failed		Check the log file for what item is reporting this error. Replace the reported item
C38A1	Data-bus test failed		
C38A2	Address-bus stuck-high test failed		
C38A3	Address-bus stuck-low test failed		
C38A4	Address-bus shorted test failed		
C38A5	Memory-cell test failed		
C39A	Logic and Temporal Monitoring Fault		

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C39A1	Max current deviation failure		a) Do a Complete rebooting sequence. b) If this happens more than two times in a row, replace joint
C39A2	Max joint-encoder speed exceeded		Same as C39A1
C39A3	Max motor-encoder speed exceeded		Same as C39A1
C39A4	Illegal state change in joint detected		Same as C39A1
C39A5	A timing issue occurred during startup.	Too fast state change in joint detected	Same as C39A1
C39A6	5V regulator voltage too low		Same as C39A1
C39A7	5V regulator voltage too high		Same as C39A1
C39A100	Watchpoint fault: ADC task timeout		Same as C39A1
C39A101	Watchpoint fault: Motor-Control task timeout		Same as C39A1
C39A102	Watchpoint fault: Motor-encoder task timeout		Same as C39A1
C39A103	Watchpoint fault: Joint-encoder task timeout		Same as C39A1
C39A104	Watchpoint fault: Communication task timeout		Same as C39A1
C39A105	Watchpoint fault: RAM-test task timeout		Same as C39A1
C39A106	Watchpoint fault: CalVal-test task timeout		Same as C39A1
C39A107	Watchpoint fault: ROM-test task timeout		Same as C39A1

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C40A	AD-Converter hit high limit joint	EMC issue external or electronics internal	Check grounding and shielding for EMC problems
C41A	RC Oscillator Trim register hit high limit		
C42A	RC Oscillator Trim register hit low limit		
C43A	Change in invariant memory detected		
C43A1	Current sensor gain		
C44A	CRC check failure on primary bus	Serial communication problem with joint or secondary bus node	a) Check black 2-wire connectors and wires in joints. b) Do a Complete rebooting sequence. c) If this happens more than two times in a row, contact your local service provider for assistance.
C44A0	Base		
C44A1	Shoulder		
C44A2	Elbow		
C44A3	Wrist 1		
C44A4	Wrist 2		
C44A5	Wrist 3		
C44A6	Tool		
C44A80	CRC Check failure on primary bus.	Interference on the communication field bus.	
C45A	AD-Converter error		
C46A	Loose gearbox or bad encoder mounting	Mechanical problem in gear related to encoder mounting	a) Do a Complete rebooting sequence b) If this happens more than two times in a row, replace joint
C47A	AD-Converter hit low limit	EMC issue external or electronics internal	Check grounding and shielding for EMC problems
C49A	RS485 receive warning		
C49A200	Secondary RS485 bus is down	Bus for: Teach Pendant, Processor A and Processor B on Control Board	Check TCP/IP-12V cable to Teach Pendant

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C50A	Robot powerup issue	Electrical error control box	Remove all external connections to I/O-interface of Safety Control Board. Check for short circuit
C50A1	Voltage detected at 24V rail before startup		
C50A2	Voltage present at unpowered robot		
C50A5	Powersupply voltage too low		Check 48 V cable between power supply and Control Board
C50A6	Powersupply voltage too high		
C50A11	Voltage not detected at 24V rail after startup		
C50A15	Warning, waiting for SafetySYS2		
C50A16	The Teach Pendant does not respond	Loose wire or incorrect safety configuration	a) Check the Teach Pendant cable and connections. b) Check the settings in the miscellaneous tab in the Safety menu
C50A17	The Euromap67 interface does not respond	Loose wire or incorrect safety configuration	a) Check the Euromap67 cable and connections. b) Check the settings in the miscellaneous tab in the Safety menu
C50A18	Warning, waiting for SafetySYS1	SafetySYS1 = Processor A on Safety Control Board	
C50A19	Warning, Waiting for a valid "euromap67 activated" status bit from secondary Safety Control Board		
C50A20	5V, 3V3 or ADC error (5V too high)		
C50A21	5V, 3V3 or ADC error (5V too low)		
C50A22	Robot current sensor reading too high		

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C50A23	Robot current sensor reading too low			
C50A24	48V not present (Check internal connection)			
C50A25	Robot voltage present at 48V PSU powereup			
C50A26	Voltage present on unpowered 48V power supply			
C50A27	12V, 3V3 or ADC error (12V too high)			
C50A28	12V, 3V3 or ADC error (12V too low)			
C50A29	Analog I/O error (-12V too high)			
C50A30	Analog I/O error (-12V too low)			
C50A31	The other safetySYS do not initialize			
C50A40	Wrong voltage from PSU1			
C50A41	Wrong voltage from PSU2			
C50A42	Voltage will not disappear from PSU			
C50A43	Warning, waiting for CB2 type answer from primary processor			
C50A50	Processor A 3.3V supply voltage out of bounds			
C50A51	Robot voltage below threshold			
C50A52	Robot voltage above threshold			
C50A53	58V generator deviation error			
C50A54	5V regulator too low			

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C50A55	5V regulator too high		
C50A56	-4V generator too low		
C50A57	-4V generator too high		
C50A80	Last CPU reset caused by Low-Power-Reset		
C50A81	Last CPU reset caused by Window-Watchdog-Reset		
C50A82	Last CPU reset caused by Independent-Watchdog-Reset		
C50A83	Last CPU reset caused by Software-Reset	The Control Board was reset on explicit request.	
C50A84	Last CPU reset caused by External-Pin-Reset		
C50A85	Last CPU reset caused by Brown-Out-Reset		
C50A99	Wrong software on PCB		
C50A100	Cable not connected		Check cable and connections between robot and control box
C50A101	Short circuit in robot detected or wrong robot connected to control box		Check robot type. Look for short circuit in cable and in robot arm
C50A102	Voltage rising too slowly		
C50A103	Voltage failed to reach acceptable level		
C50A104	The IMMI module does not respond		
C51A	CRC check failure on secondary bus		
C51A0	Processor B		

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C51A1	Primary screen processor	CRC check failure on safety processor 1 in Teach Pendant	
C51A2	Secondary screen processor	CRC check failure on safety processor 2 in Teach Pendant	
C51A3	Primary E67		
C51A4	Secondary E67		
C53A	IO overcurrent detected	Control Board error	Remove all external connections to I/O-interface of Safety Control Board. Check for short circuit
C53A1	IO Overcurrent detected. Max is 800mA		
C53A2	IO Overcurrent detected. Max is 600mA		
C55A	Safety system error	Safety system malfunction	a) Check Motherboard, Control Board, Screenboard, Current distributor (Euromap, if installed). b) Check safety devices and cables/connections to these devices. c) Do a Complete rebooting sequence
C55A23	Safety relay error (minus connection)	Current distributor error	a) Check cable from Control Board to Current distributor or 48V Power supply and Current distributor for issues b) Do a Complete rebooting sequence
C55A24	Safety relay error (plus connection)	Current distributor error	a) Check cable from Control Board to Current distributor or 48V Power supply and Current distributor for issues b) Do a Complete rebooting sequence

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C55A33	Safety relay error (a relay is stuck)	Current distributor error	a) Check cable from Control Board to Current distributor or 48V Power supply and Current distributor for issues b) Do a Complete rebooting sequence
C55A34	Safety relay error (relays are not on)	Current distributor error	a) Check cable from Control Board to Current distributor or 48V Power supply and Current distributor for issues b) Do a Complete rebooting sequence
C55A50	Voltage present at unpowered robot	Safety Control Bord hardware fault	a) Do a Complete rebooting sequence. b) If this happens more than two times in a row, replace Control Board
C55A51	Voltage will not disappear from robot	Safety Control Bord hardware fault	a) Do a Complete rebooting sequence. b) If this happens more than two times in a row, replace Control Board
C55A52	5V, 3V3 or ADC error (5V too low)	Safety Control Bord hardware fault	a) Do a Complete rebooting sequence. b) If this happens more than two times in a row, replace Control Board
C55A53	5V, 3V3 or ADC error (5V too high)	Safety Control Bord hardware fault	a) Do a Complete rebooting sequence. b) If this happens more than two times in a row, replace Control Board
C55A90	Bootloader error, robot voltage too low or current too high		
C55A91	Bootloader error, robot voltage too high		
C55A100	Safety violation		
C55A101	Safety Channel Error In Safety Control Board		
C55A102	Safety Channel Error In Screen		

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C55A103	Safety Channel Error In Euromap67 Interface		
C55A109	Received fault message from Controller		
C55A110	Safety State is changing too often		
C55A111	On/Off State is changing too often		
C55A112	Robot current sensors readings differ		
C55A120	Robot current is too high while emergency stopped		
C55A121	Robot current is too high while safeguard stopped		
C56A	Overvoltage shutdown	Voltage exceeded 55V	a) Check Energy Eaters cable and connections. b) Check Energy. c) Replace Energy Eater
C57A	Brake release failure		a) Check Brake, solenoid. b) Check TCP configuration, payload and mounting settings
C57A1	Joint did not move or motor encoder is not functioning		
C57A2	Large movement detected during brake release		
C57A3	Robot was not able to brake release, see log for details		
C58A	Motor encoder not calibrated		

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C59A	Overcurrent shutdown	Overcurrent in joint. Argument = Current in Amps	a) Check for short circuit. b) Do a Complete rebooting sequence. c) If this happens more than two times in a row, replace joint
C60A	Energy surplus shutdown	The power supply is sending energy to the energy eater	a) Ensure power grid is not delivering more than 48V b) Measure robot energy input c) Contact your local Universal Robots service provider for assistance.
C61A	Idle power consumption to high	The system is drawing more power than expected while idle	a) Check Energy Eaters cables and connections b) Check Energy Eater c) Replace Energy Eater
C62A	Thermal issue		a) Check nothing is hindering free movement of the joints. b) Check TCP configuration, payload and mounting settings
C62A1	Joint temperature: High (80 C)		
C62A3	Warning: Static load too high		
C62A11	Joint temperature: Shut down (85 C)		
C62A13	Shutdown: Static load too high		
C63A	Motor test failed	Joint motor has a failure in a step	
C64A	Interface connection error		
C65A	PSU voltage to high	The power supply output voltage is above 48.7V	a) Ensure supply is not delivering more than 48V b) Contact support
C68A	SPI error	Joint: Absolut encoder on joint communication error	a) Check for short circuit. b) Do a Complete rebooting sequence. c) If this happens more than several times in a row, replace joint

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C70A	Close to gearbox shear limit	Acceleration / deceleration to high. Mechanical problem in gear related to encoder mounting	a) Reduce acceleration in user program. b) Do a Complete rebooting sequence. c) If this happens more than several times in a row, replace joint
C71A	Startup check error		Check for the phases of motor in the joint. Update firmware
C71A0	Hardware is size0, wrong firmware at the joint		Update firmware
C71A1	Hardware is size1, wrong firmware at the joint		Update firmware
C71A2	Hardware is size2, wrong firmware at the joint		Update firmware
C71A3	Hardware is size3, wrong firmware at the joint		Update firmware
C71A4	Hardware is size4, wrong firmware at the joint		Update firmware
C71A5	Invalid hardware revision		
C71A6	ADC calibration failed		
C71A7	Unknown error result	The motor wires are damaged, bad connection in screw terminals or defect PCB	a) Check joint for damaged or loose connections. b) Replace the joint
C71A8	Motor short circuit to ground or H-bridge problems	The motor wires are damaged, bad connection in screw terminals or defect PCB	a) Check joint for damaged or loose connections. b) Replace the joint
C71A9	Motor indication signal does not work	The motor wires are damaged, bad connection in screw terminals or defect PCB	a) Check joint for damaged or loose connections. b) Replace the joint

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C71A10	Phase 1 is unconnected or not working	The motor wires are damaged, bad connection in screw terminals or defect PCB	a) Check joint for damaged or loose connections. b) Replace the joint
C71A11	Phase 2 is unconnected or not working	The motor wires are damaged, bad connection in screw terminals or defect PCB	a) Check joint for damaged or loose connections. b) Replace the joint
C71A12	Phase 3 or multiple phases is unconnected or not working	The wire is (1) damaged or (2) has been disconnected from the PCB (not likely) or (3) defect PCB	a) Check joint for damaged or loose connections. b) Replace the joint
C71A50	Current sensor test failed	Sensor reported wrong current when probed	a) Check joint for damaged or loose connections. b) Replace the joint
C71A51	Current sensor test failed	Sensor reported wrong current when probed	a) Check joint for damaged or loose connections. b) Replace the joint
C71A52	Current sensor test failed	Sensors reported different currents when probed	a) Check joint for damaged or loose connections. b) Replace the joint
C71A101	Wrong firmware on RLS encoder		
C72A	Power Supply Unit failure		
C72A1	0 PSUs are active	Power Supply was not able to deliver 48V	Check power connection between power supply and Control Board
C72A2	1 PSU active, but we expect 2 (UR10)	Power Supply was not able to deliver 48V or UR10 flash card in UR5 robot	Check power connection between power supply and Control Board and check that the flash card and robot match
C72A3	2 PSUs active, but we expect 1 (UR5)	UR5 flash card in UR10 robot	Check that the flash card and robot match
C74A	Joint encoder warning	Magnetic encoder error (absolute encoder). Argument = sum of C74 errors	

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C74A1	Invalid decode: Readhead misalignment, ring damaged or external magnetic field present.		Check grounding and shielding for EMC problems
C74A2	Speed reading is not valid		
C74A4	System error=malfunction or inconsistent calibration detected		
C74A8	Supply voltage is out of range		
C74A16	Temperature is out of range		
C74A32	Signal lost =Misaligned readhead or damaged ring		
C74A64	Signal low =Too far from magnetic ring		
C74A128	Signal saturation =Too close to magnetic ring		
C75A	Joint encoder error	Magnetic encoder error (absolute encoder). Argument = sum of C75 errors	Check encoder connections
C75A1	Invalid decode: Readhead misalignment, ring damaged or external magnetic field present.		a) Do a Complete rebooting sequence. b) Check grounding and shielding for EMC problems. c) If this happens more than two times in a row, replace joint
C75A2	Speed reading is not valid		a) Do a Complete rebooting sequence. b) If this happens more than two times in a row, replace joint

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C75A4	System error=malfunction or inconsistent calibration detected		a) Do a Complete rebooting sequence. b) If this happens more than two times in a row, replace joint
C75A8	Supply voltage is out of range		
C75A16	Temperature is out of range		
C75A32	Signal lost =Misaligned readhead or damaged ring		a) Do a Complete rebooting sequence. b) Check grounding and shielding for EMC problems. c) If this happens more than two times in a row, replace joint
C75A64	Signal low =Too far from magnetic ring		a) Do a Complete rebooting sequence. b) Check grounding and shielding for EMC problems. c) If this happens more than two times in a row, replace joint
C75A128	Signal saturation =Too close to magnetic ring		a) Do a Complete rebooting sequence. b) Check grounding and shielding for EMC problems. c) If this happens more than two times in a row, replace joint
C75A200	Position from joint encoder does not change while motor is running		
C76A	Joint encoder communication CRC issue	Error between sensor and joint circuit	Check connections or very heavy electrical noise
C77A	Sudden position change detected on the joint-encoder	The position reading from the encoder was different than expected.	

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C78A	Large sudden position change detected on the joint-encoder	The position reading from the encoder was severely different than expected, the latest measurement was discarded. The argument relates to the size of the position change.	
C85A200	Position from motor encoder does not change while motor is running		
C85A	Motor encoder error		
C100A	Robot changed mode	Status warning, general mode change	Check preceding errors in log history
C101A	Real Robot Connected		
C102A	Real Robot not connected - Simulating Robot		
C103A	Communication issue		
C103A1	Connection to Safety Control Board lost	PC did not receive 3 packets in a row	a) Check that the Ethernet cable between Motherboard and Control Board is connected. b) Do a Complete rebooting sequence
C103A2	Package lost from Safety Control Board		
C103A3	Ethernet connection initialization with Safety Control Board failed		
C104A	Error=Empty command sent to robot		
C111A	Something is pulling the robot		Check TCP configuration, payload and mounting settings
C115A	Unknown robot type	The robot type specified in the configuration is unknown	
C116A	Realtime part warning	Possible CPU-overload due to structure of user program	Restructure user program

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C117A	Restart SCB failed	The Control Board couldn't be rebooted from the controller.	Do a Complete rebooting sequence
C150A	Protective Stop: Position close to joint limits		
C151A	Protective Stop: Tool orientation close to limits		
C152A	Protective Stop: Position close to safety plane limits		
C153A	Protective Stop: Position deviates from path		
C153A0	(base). Check payload, center of gravity and acceleration settings. Log screen may contain additional information.		Check payload, center of gravity and acceleration settings.
C153A1	(shoulder). Check payload, center of gravity and acceleration settings. Log screen may contain additional information.		Check payload, center of gravity and acceleration settings.
C153A2	(elbow). Check payload, center of gravity and acceleration settings. Log screen may contain additional information.		Check payload, center of gravity and acceleration settings.
C153A3	(wrist 1). Check payload, center of gravity and acceleration settings. Log screen may contain additional information.		Check payload, center of gravity and acceleration settings.

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C153A4	(wrist 2). Check payload, center of gravity and acceleration settings. Log screen may contain additional information.		Check payload, center of gravity and acceleration settings.
C153A5	(wrist 3). Check payload, center of gravity and acceleration settings. Log screen may contain additional information.		Check payload, center of gravity and acceleration settings.
C154A	Protective Stop: Position in singularity	Robot cannot move linear near a singularity	Use MoveJ or change the motion
C155A	Protective Stop: Robot cannot maintain its position, check if payload is correct		
C156A	Protective Stop: Wrong payload or mounting detected, or something is pushing the robot when entering Freedrive mode	The robot may move unexpected due to wrong settings	Verify that the TCP configuration and mounting in the used installation is correct
C157A	Protective Stop: Collision detected by joint		
C157A0	(base). Check payload, center of gravity and acceleration settings. Log screen may contain additional information.		Make sure no objects are in the path of the robot and resume the program.

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C157A1	(shoulder). Check payload, center of gravity and acceleration settings. Log screen may contain additional information.		Make sure no objects are in the path of the robot and resume the program.
C157A2	(elbow). Check payload, center of gravity and acceleration settings. Log screen may contain additional information.		Make sure no objects are in the path of the robot and resume the program.
C157A3	(wrist 1). Check payload, center of gravity and acceleration settings. Log screen may contain additional information.		Make sure no objects are in the path of the robot and resume the program.
C157A4	(wrist 2). Check payload, center of gravity and acceleration settings. Log screen may contain additional information.		Make sure no objects are in the path of the robot and resume the program.
C157A5	(wrist 3). Check payload, center of gravity and acceleration settings. Log screen may contain additional information.		Make sure no objects are in the path of the robot and resume the program.
C158A	Protective Stop: Collision detected by joint		
C158A0	(base). The user specified payload is 0kg, please make sure this is correct.	Specifying an incorrect payload mass and/or center of gravity may cause poor robot performance and/or protective stops.	Make sure the specified payload mass and center of gravity are correctly specified.

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C158A1	(shoulder). The user specified payload is 0kg, please make sure this is correct.	Specifying an incorrect payload mass and/or center of gravity may cause poor robot performance and/or protective stops.	Make sure the specified payload mass and center of gravity are correctly specified.
C158A2	(elbow). The user specified payload is 0kg, please make sure this is correct.	Specifying an incorrect payload mass and/or center of gravity may cause poor robot performance and/or protective stops.	Make sure the specified payload mass and center of gravity are correctly specified.
C158A3	(wrist 1). The user specified payload is 0kg, please make sure this is correct.	Specifying an incorrect payload mass and/or center of gravity may cause poor robot performance and/or protective stops.	Make sure the specified payload mass and center of gravity are correctly specified.
C158A4	(wrist 2). The user specified payload is 0kg, please make sure this is correct.	Specifying an incorrect payload mass and/or center of gravity may cause poor robot performance and/or protective stops.	Make sure the specified payload mass and center of gravity are correctly specified.
C158A5	(wrist 3). The user specified payload is 0kg, please make sure this is correct.	Specifying an incorrect payload mass and/or center of gravity may cause poor robot performance and/or protective stops.	Make sure the specified payload mass and center of gravity are correctly specified.
C159A	Protective Stop: Position deviates from path		
C159A0	(base). The user specified payload is 0kg, please make sure this is correct.	Specifying an incorrect payload mass and/or center of gravity may cause poor robot performance and/or protective stops.	Make sure the specified payload mass and center of gravity are correctly specified.
C159A1	(shoulder). The user specified payload is 0kg, please make sure this is correct.	Specifying an incorrect payload mass and/or center of gravity may cause poor robot performance and/or protective stops.	Make sure the specified payload mass and center of gravity are correctly specified.
C159A2	(elbow). The user specified payload is 0kg, please make sure this is correct.	Specifying an incorrect payload mass and/or center of gravity may cause poor robot performance and/or protective stops.	Make sure the specified payload mass and center of gravity are correctly specified.

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C159A3	(wrist 1). The user specified payload is 0kg, please make sure this is correct.	Specifying an incorrect payload mass and/or center of gravity may cause poor robot performance and/or protective stops.	Make sure the specified payload mass and center of gravity are correctly specified.
C159A4	(wrist 2). The user specified payload is 0kg, please make sure this is correct.	Specifying an incorrect payload mass and/or center of gravity may cause poor robot performance and/or protective stops.	Make sure the specified payload mass and center of gravity are correctly specified.
C159A5	(wrist 3). The user specified payload is 0kg, please make sure this is correct.	Specifying an incorrect payload mass and/or center of gravity may cause poor robot performance and/or protective stops.	Make sure the specified payload mass and center of gravity are correctly specified.
C160A	Protective stop: The robot was powered off last time due to a joint position disagreement		a) Verify that the robot position in the 3D graphics matches the real robot, to ensure that the encoders function before releasing the brakes. Stand back and monitor the robot performing its first program cycle as expected. b) If the position is not correct, the robot must be repaired. In this case, click Power Off Robot. c) If the position is correct, please tick the check box below the 3D graphics and click Robot Position Verified

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C161A	Protective stop: Large movement of the robot detected while it was powered off. The joints were moved while it was powered off, or the encoders do not function		a) Verify that the robot position in the 3D graphics matches the real robot, to ensure that the encoders function before releasing the brakes. Stand back and monitor the robot performing its first program cycle as expected. b) If the position is not correct, the robot must be repaired. In this case, click Power Off Robot. c) If the position is correct, please tick the check box below the 3D graphics and click Robot Position Verified
C162A	The protective stop was likely caused by incorrectly specified payload mass and/or center of gravity.	Specifying an incorrect payload mass and/or center of gravity may cause poor robot performance and/or protective stops.	Make sure the specified payload mass and center of gravity are correct.
C171A	Issue with blends		
C171A0	A MoveC-waypoint were skipped due to a blend.	The value for the blend radius is too large compared to the distance between the waypoints.	Decrease the blend radius or choose waypoints that are further apart.
C171A1	Blend radius too small in a MoveC		Increase blend in MoveC
C171A3	A ServoC-waypoint were skipped due to a blend.	The value for the blend radius is too large compared to the distance between the waypoints.	Decrease the blend radius or choose waypoints that are further apart.
C171A4	Overlapping Blends in a MoveJ, a waypoint was skipped		Decrease the blend radius or choose waypoints that are further apart.
C171A5	Overlapping Blends in a MoveJ, a waypoint was skipped		Decrease the blend radius or choose waypoints that are further apart.
C171A6	Overlapping Blends in a MoveJ, a waypoint was skipped		Decrease the blend radius or choose waypoints that are further apart.

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C171A7	Overlapping Blends in a MoveJ, a waypoint was skipped		Decrease the blend radius or choose waypoints that are further apart.
C171A9	A MoveP-waypoint were skipped due to a blend.	The value for the blend radius is too large compared to the distance between the waypoints.	Decrease the blend radius or choose waypoints that are further apart.
C171A10	Blend radius too small error in a MoveP		
C171A11	Overlapping Blends in a MoveL, a waypoint was skipped		Decrease the blend radius or choose waypoints that are further apart.
C171A12	Overlapping Blends in a MoveL, a waypoint was skipped		Decrease the blend radius or choose waypoints that are further apart.
C171A13	Overlapping Blends in a MoveL, a waypoint was skipped		Decrease the blend radius or choose waypoints that are further apart.
C171A14	Overlapping Blends in a MoveL, a waypoint was skipped		Decrease the blend radius or choose waypoints that are further apart.
C172A	Illegal control mode		
C173A0	Robot motion causes too high joint torques on Base.		Review your accelerations, blends and if there are collisions or excessive torques in the joint, adjust accordingly.
C173A1	Robot motion causes too high joint torques on Shoulder.		Same as C173A0
C173A2	Robot motion causes too high joint torques on Elbow.		Same as C173A0
C173A3	Robot motion causes too high joint torques on Wrist 1.		Same as C173A0
C173A4	Robot motion causes too high joint torques on Wrist 2.		Same as C173A0
C173A5	Robot motion causes too high joint torques on Wrist 3.		Same as C173A0

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C173A6	Robot motion causes too high joint torques on Base. Problem identified in program		Same as C173A0
C173A7	Robot motion causes too high joint torques on Shoulder. Problem identified in program		Same as C173A0
C173A8	Robot motion causes too high joint torques on Elbow. Problem identified in program		Same as C173A0
C173A9	Robot motion causes too high joint torques on Wrist 1. Problem identified in program		Same as C173A0
C173A10	Robot motion causes too high joint torques on Wrist 2. Problem identified in program		Same as C173A0
C173A11	Robot motion causes too high joint torques on Wrist 3. Problem identified in program		Same as C173A0
C174A0	Robot motion causes too high jump in joint torques on Base.		
C174A1	Robot motion causes too high jump in joint torques on Shoulder.		
C174A2	Robot motion causes too high jump in joint torques on Elbow.		
C174A3	Robot motion causes too high jump in joint torques on Wrist 1.		
C174A4	Robot motion causes too high jump in joint torques on Wrist 2.		
C174A5	Robot motion causes too high jump in joint torques on Wrist 3.		

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C174A6	Base. Problem identified when executing program on a specified line.		
C174A7	Shoulder. Problem identified when executing program on a specified line.		
C174A8	Elbow. Problem identified when executing program on a specified line.		
C174A9	Wrist 1. Problem identified when executing program on a specified line.		
C174A10	Wrist 2. Problem identified when executing program on a specified line.		
C174A11	Wrist 3. Problem identified when executing program on a specified line.		
C187A1	Temperature sensor test failed	Starting temperature were lower than expected	Make sure that the robot is running on the allowed range of temperature.
C187A2	Temperature sensor test failed	Starting temperature were higher than expected	Same as C187A1
C187A3	Temperature sensor test failed	Temperature increased less than expected during warm up	Same as C187A1
C187A4	Temperature sensor test failed	Temperature increased more than expected during warm up	Same as C187A1
C191A	Safety system violation		
C191A1	Joint position limit violated	The maximum range has been exceeded	
C191A2	Joint speed limit violated	The maximum speed has been exceeded	

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C191A3	TCP speed limit violated	The maximum speed has been exceeded	
C191A4	TCP position limit violated	The maximum range has been exceeded	
C191A5	TCP orientation limit violated	The maximum orientation has been exceeded	
C191A6	Power limit violated	The maximum power has been exceeded	
C191A7	Joint torque window violated	The maximum torque has been exceeded	
C191A8	Joint torque window too large	The maximum torque has been exceeded	
C191A9	Reduced mode output violation		
C191A10	Safeguard stop output violation		
C191A11	Emergency stop output violation		
C191A12	Momentum limit violation		
C191A13	Robot moving output violation		
C191A14	Robot is not braking in stop mode	During the braking process, the safety system monitors if the robot brakes as expected. If this is not the case, this error is generated	Check TCP configuration, payload and mounting settings
C191A15	Robot is moving in stop mode	When the robot is stopped due to a safety violation or a safeguard stop, the safety system generates this error, if the robot moves while in this mode	a) Check if the robot is physically pushed while safeguard stopped. b) Check TCP configuration, payload and mounting settings
C191A16	Robot did not stop in time		
C191A17	Received a null vector for TCP orientation		
C191A18	Robot not stopping output violation		
C191A19	Invalid safety IO configuration		

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C191A20	Configuration information or limit sets not received		
C191A21	The other safety processor detected a violation		
C191A22	Received unknown command from Controller		
C191A23	Invalid setup of safety limits		a) Check Firmware/update firmware. b) Do a Complete rebooting sequence
C191A24	Reduced Mode Output set, while it should not be		a) Check Firmware/update firmware. b) Do a Complete rebooting sequence
C191A25	Reduced Mode Output not set, while it should be		a) Check Firmware/update firmware. b) Do a Complete rebooting sequence
C191A26	Not Reduced Mode Output set, while it should not be		a) Check Firmware/update firmware. b) Do a Complete rebooting sequence
C191A27	Not Reduced Mode Output not set, while it should be		a) Check Firmware/update firmware. b) Do a Complete rebooting sequence
C191A28	Robot Emergency Stop exceeded maximum stop time		a) Check that max payload of the robot has not been exceeded. b) Check TCP configuration, payload and mounting settings
C191A29	System Emergency Stop exceeded maximum stop time		a) Check that max payload of the robot has not been exceeded. b) Check TCP configuration, payload and mounting settings

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C191A30	Safeguard Stop exceeded maximum stop time		a) Check that max payload of the robot has not been exceeded. b) Check TCP configuration, payload and mounting settings
C191A31	Operation mode switch is present while the three position switch is missing		
C191A32	Joint speed limit violated - Base		
C191A33	Joint speed limit violated - Shoulder		
C191A34	Joint speed limit violated - Elbow		
C191A35	Joint speed limit violated - Wrist 1		
C191A36	Joint speed limit violated - Wrist 2		
C191A37	Joint speed limit violated - Wrist 3		
C192A	Safety system fault		
C192A1	Robot still powered in emergency stop	When the emergency stop is active, the robot arm powers off. The controller is responsible for sending the power off command. This error is generated if the safety system detects that the robot arm still has power	
C192A2	Robot emergency stop disagreement	E-stop in teach pendant or in robot E-stop circuit problem	Check safety devices and cables/connections to these devices.
C192A3	System emergency stop disagreement	System E-stop circuit problem	Check safety devices and cables/connections to these devices.
C192A4	Safeguard stop disagreement	Safeguard circuit problem	Check safety devices and cables/connections to these devices.

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C192A5	Euromap safeguard stop disagreement	Euromap circuit problem	Check cables from Control Board to Euromap and to external machine
C192A6	Joint position disagreement		a) Check TCP configuration, payload and mounting settings. b) Check that safety settings respected
C192A7	Joint speed disagreement		a) Check TCP configuration, payload and mounting settings. b) Check that safety settings respected
C192A8	Joint torque disagreement		a) Check TCP configuration, payload and mounting settings. b) Check that safety settings respected
C192A9	TCP speed disagreement		a) Check TCP configuration, payload and mounting settings. b) Check that safety settings respected
C192A10	TCP position disagreement		a) Check TCP configuration, payload and mounting settings. b) Check that safety settings respected
C192A11	TCP orientation disagreement		a) Check TCP configuration, payload and mounting settings. b) Check that safety settings respected
C192A12	Power disagreement	Power calculation: uP-A and uP-B disagreement	
C192A13	Joint torque window disagreement		
C192A14	Reduced mode input disagreement	Safety I/O uP-A and uP-B disagreement	Check safety devices and cables/connections to these devices
C192A15	Reduced mode output disagreement	Safety I/O uP-A and uP-B disagreement	Check safety devices and cables/connections to these devices

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C192A16	Safety output failed	The safety output did not reach the correct value in the expected time	Check for short circuit on I/O or for wrong connection to output.
C192A17	Safeguard stop output disagreement	Safety I/O uP-A and uP-B disagreement	Check safety devices and cables/connections to these devices
C192A18	The other safety processor is in fault		
C192A19	Emergency stop output disagreement	Safety I/O uP-A and uP-B disagreement	Check safety devices and cables/connections to these devices
C192A20	SPI output error detected	Power supply for the I/O is not detected	Check if the connection to the internal power supply is correct. If an external power supply is being used, check if it is powered on and at the correct voltage.
C192A21	Momentum disagreement		
C192A22	Robot moving output disagreement		Check safety devices and cables/connections to these devices
C192A23	Wrong processor ID		
C192A24	Wrong processor revision		
C192A25	Potential brownout detected	Voltage drop on Control Board or defect Safety Control Board	
C192A26	Emergency stop output disagreement		Check safety devices and cables/connections to these devices
C192A27	Safeguard stop output disagreement		Check safety devices and cables/connections to these devices
C192A28	Robot not stopping output disagreement		Check safety devices and cables/connections to these devices
C192A29	Safeguard reset input disagreement		Check safety devices and cables/connections to these devices

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C192A30	Safety processor booted up in fault mode		
C192A31	Reduced Mode Output disagreement		Check safety devices and cables/connections to these devices
C192A32	Not Reduced Mode Output disagreement		Check safety devices and cables/connections to these devices
C192A33	A timing issue occurred during startup. Please restart to proceed	Checksum disagreement between safety processors uA and uB	
C192A34	User safety config checksum disagreement between uA and GUI		
C192A35	Robot config checksum disagreement between uA and GUI		
C192A36	Online RAM test failed		
C192A37	Not all safety related functionalities are running		
C192A38	Package too short for CRC calculation		
C192A39	Three position switch input disagreement		
C192A40	Operation mode switch input disagreement		
C193A	One of the nodes is in fault mode		
C193A0	Base Joint		a) See previous error. b) Update the firmware on the joint. c) Do a Complete rebooting sequence

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C193A1	Shoulder Joint		a) See previous error. b) Update the firmware on the joint. c) Do a Complete rebooting sequence
C193A2	Elbow Joint		a) See previous error. b) Update the firmware on the joint. c) Do a Complete rebooting sequence
C193A3	Wrist 1 Joint		a) See previous error. b) Update the firmware on the joint. c) Do a Complete rebooting sequence
C193A4	Wrist 2 Joint		a) See previous error. b) Update the firmware on the joint. c) Do a Complete rebooting sequence
C193A5	Wrist 3 Joint		a) See previous error. b) Update the firmware on the joint. c) Do a Complete rebooting sequence
C193A6	Tool		a) See previous error. b) Do a Complete rebooting sequence
C193A7	Screen 1	Control Board has detected an error on Safety processor 1 in Teach pendant	a) See previous error. b) Do a Complete rebooting sequence
C193A8	Screen 2	Control Board has detected an error on Safety processor 2 in Teach pendant	a) See previous error. b) Do a Complete rebooting sequence
C193A9	Euromap 1		a) See previous error. b) Do a Complete rebooting sequence
C193A10	Euromap 2		a) See previous error. b) Do a Complete rebooting sequence
C194A	One of the nodes is not booted or not present		

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C194A0	Base Joint		
C194A1	Shoulder Joint		
C194A2	Elbow Joint		
C194A3	Wrist 1 Joint		
C194A4	Wrist 2 Joint		
C194A5	Wrist 3 Joint		
C194A6	Tool		
C194A7	Screen 1	Control Board has detected an error on Safety processor 1 in Teach pendant	
C194A8	Screen 2	Control Board has detected an error on Safety processor 2 in Teach pendant	
C194A9	Euromap 1		
C194A10	Euromap 2		
C194A128	Base not ready while brake release requested	Must be at least in IDLE mode when the brake release is requested	Check for loose communication cable
C194A129	Shoulder not ready while brake release requested	Must be at least in IDLE mode when the brake release is requested	Check for loose communication cable
C194A130	Elbow not ready while brake release requested	Must be at least in IDLE mode when the brake release is requested	Check for loose communication cable
C194A131	Wrist 1 not ready while brake release requested	Must be at least in IDLE mode when the brake release is requested	Check for loose communication cable
C194A132	Wrist 2 not ready while brake release requested	Must be at least in IDLE mode when the brake release is requested	Check for loose communication cable
C194A133	Wrist 3 not ready while brake release requested	Must be at least in IDLE mode when the brake release is requested	Check for loose communication cable
C194A134	Tool not ready while brake release requested	Must be at least in IDLE mode when the brake release is requested	Check for loose communication cable
C195A	Conveyor speed too high	Conveyor speed higher than robot can run	Make sure that conveyor tracking is set up correctly
C195A1	for joint speed safety limit		

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C195A2	for TCP speed safety limit		
C195A3	for momentum safety limit		
C196A	MoveP speed too high	Too high speed in relation to blend radius	Reduce speed or increase blend radius in user program
C197A	Blend overlap warning		Review blend values in the program
C200A	Safety Control Board hardware error		Check Safety Control Board functionality
C200A1	Hardware ID is wrong	Safety Control Board: uP-A has detected an error: Wrong Safety Control Board	a) Do a Complete rebooting sequence. b) If this happens more than two times in a row, replace Safety Control Board
C200A2	MCU type is wrong	Safety Control Board: uP-A has detected an error	a) Do a Complete rebooting sequence. b) If this happens more than two times in a row, replace Safety Control Board
C200A3	Part ID is wrong	Safety Control Board: uP-A has detected an error	a) Do a Complete rebooting sequence. b) If this happens more than two times in a row, replace Safety Control Board
C200A4	RAM test failed	Safety Control Board: uP-A has detected an error	a) Do a Complete rebooting sequence. b) If this happens more than two times in a row, replace Safety Control Board
C200A5	Register test failed	Safety Control Board: uP-A has detected an error	a) Do a Complete rebooting sequence. b) If this happens more than two times in a row, replace Safety Control Board
C200A6	pRom Crc test failed	Safety Control Board: uP-A has detected an error: firmware error	a) Do a Complete rebooting sequence. b) If this happens more than two times in a row, replace Safety Control Board
C200A7	Watchdog reset the processor	Safety Control Board: uP-A has detected an error	

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C200A8	OVG signal test not passed	Safety Control Board: uP-A has detected an error: over voltage generator	a) Do a Complete rebooting sequence. b) If this happens more than two times in a row, replace Safety Control Board
C200A9	3V3A power good pin is low	Safety Control Board: uP-A has detected an error	a) Do a Complete rebooting sequence. b) If this happens more than two times in a row, replace Safety Control Board
C200A10	3V3B power good pin is low	Safety Control Board: uP-A has detected an error	a) Do a Complete rebooting sequence. b) If this happens more than two times in a row, replace Safety Control Board
C200A11	5V power good is low	Safety Control Board: uP-A has detected an error	a) Do a Complete rebooting sequence. b) If this happens more than two times in a row, replace Safety Control Board
C200A12	3V3 voltage too low	Safety Control Board: uP-A has detected an error	a) Do a Complete rebooting sequence. b) If this happens more than two times in a row, replace Safety Control Board
C200A13	3v3 voltage too high	Safety Control Board: uP-A has detected an error	a) Do a Complete rebooting sequence. b) If this happens more than two times in a row, replace Safety Control Board
C200A14	48V input is too low		a) Do a Complete rebooting sequence. b) Check 48 V Power supply, current distributer, energy eater and Control Board for issues
C200A15	48V input is too high		a) Do a Complete rebooting sequence. b) Check 48 V Power supply, current distributer, energy eater and Control Board for issues

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C200A16	24V IO short circuited	Too high current	a) Do a Complete rebooting sequence. b) Disconnect external I/O connections and check external power supply if connected
C200A17	PC current is too high	Motherboard takes too high current	a) Do a Complete rebooting sequence. b) Check cable between Control Board and Motherboard and check all connections to Motherboard. Also check for short circuit
C200A18	Robot voltage is too low		a) Do a Complete rebooting sequence. b) Check for short circuit in robot arm. c) Check 48 V Power supply, current distributer, energy eater and Control Board for issues
C200A19	Robot voltage is too high		a) Do a Complete rebooting sequence. b) Check 48 V Power supply, current distributer, energy eater and Control Board for issues
C200A20	24V IO voltage is too low		a) Do a Complete rebooting sequence. b) Disconnect I/O, check external power supply if connected and check Control Board for issues
C200A21	12V voltage is too high		a) Do a Complete rebooting sequence. b) Check 12 V Power supply, cables and Control Board for issues
C200A22	12V voltage is too low		a) Do a Complete rebooting sequence. b) Check 12 V Power supply, cables and Control Board for issues

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C200A23	It took too long to stabilize 24V		a) Do a Complete rebooting sequence. b) Check 24 V and Control Board for issues
C200A24	It took too long to stabilize 24V IO		a) Do a Complete rebooting sequence. b) Check 24 V and Control Board for issues
C200A25	24V voltage is too high		a) Check external 24 V and Control Board for issues. b) Do a Complete rebooting sequence. c) If this happens more than two times in a row, replace Safety Control Board.
C200A26	24V IO voltage is too high		a) Disconnect I/O's. b) Do a Complete rebooting sequence. c) Check external 24 V and Control Board for issues
C201A	Setup of Safety Control Board failed		
C201A0	Setup of Safety Control Board failed	No data was received from the Control Board at initialization or invalid safety parameters have been received	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C201A1	SCB uA is not responding	No data or invalid data was received from the Control Board uA at initialization	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C201A2	SCB uB is not responding	No data or invalid data was received from the Control Board uB at initialization	Do a Complete rebooting sequence.
C201A3	SCB is not responding	No data or invalid was received from Control Board when requested for configuration parameters	Do a Complete rebooting sequence.

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C202A	SCE configuration was illegal, after applying tolerances		
C203A	PolyScope detected a mismatch between the shown and (to be) applied safety parameters	PolyScope continuously verifies that the shown safety parameters are equal to the running parameters	a) Check that the software version is the same or newer than the firmware on the Safety Control Board. b) Reload the installation. c) Do a Complete rebooting sequence
C204A	Protective Stop: Path sanity check failed		
C204A1	Sudden change in target position		
C204A2	Inconsistency between target position and speed	Controller is detecting that position in current cycle has changed much more than it should based on expected joint speed.	a) Either an incorrect payload is mounted, or an external force is pushing the robot. b) Check TCP configuration, payload and mounting settings.
C204A3	Sudden stop	The program contains motions that are not ramped correctly down	To abort a motion, use \stopj\" or \"stopl\" script commands to generate a smooth deceleration before using \"wait\". Avoid aborting motions between waypoints with blend"
C204A4	Robot has not stopped in the allowed reaction and braking time		
C204A5	Robot program resulted in invalid setpoint		Review waypoints in the program
C204A6	Blending failed and resulted in an invalid setpoint		Try changing the blend radius or contact technical support
C204A7	Robot approaching singularity - Acceleration threshold failed		Review waypoints in the program, try using MoveJ instead of MoveL in the position close to singularity

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C205A	Target speed does not match target position		
C205A0	Inconsistency between target position and speed		
C206A	Sanity check failed		
C206A0	Target joint speed does not match target joint position change - Base		
C206A1	Target joint speed does not match target joint position change - Shoulder		
C206A2	Target joint speed does not match target joint position change - Elbow		
C206A3	Target joint speed does not match target joint position change - Wrist 1		
C206A4	Target joint speed does not match target joint position change - Wrist 2		
C206A5	Target joint speed does not match target joint position change - Wrist 3		
C207A	Fieldbus input disconnected		Check fieldbus connections (RTDE, ModBus, EtherNet/IP and Profinet) or disable the fieldbus in the installation. Check RTDE watchdog feature. Check if a URCap is using this feature.
C208A	Debug Assertion failed	An assert was executed. Notice: The functionality is exclusively used for testing purposes.	

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C209A	A protective stop was triggered (for test purposes only)	A protective stop was triggered. Notice: The functionality is exclusively used for testing purposes.	
C210A	Socket is read-only when the robot is in local (Teach pendant) control		Set the robot in remote control in PolyScope to enable receiving scripts in the controller
C211A	Operational mode changed		
C211A0	Disabled		
C211A1	Automatic		
C211A2	Manual		
C212A	Name conflict in loaded program		
C212A1	Name conflict(s) occurred between feature names and program variables	Some feature names and program variables share the same name, which may cause confusion.	Rename the program variables.
C213A	No Kinematic Calibration found (calibration.conf file is either corrupt or missing)	Calibration.conf file is either corrupt or missing	A new kinematics calibration may be needed if the robot needs to improve its kinematics, otherwise, ignore this message.
C214A	Kinematic Calibration for the robot does not match the joint(s)	The calibration checksum stored in the calibration.conf does not match the values from the joint(s)	If moving a program from a different robot to this one, re-kinematic calibrate the second robot to improve kinematics, otherwise ignore this message.
C214A1	The Kinematic Calibration checksum does not match the Base checksum	The calibration checksum stored in the calibration.conf does not match the values from the joint(s)	If moving a program from a different robot to this one, re-kinematic calibrate the second robot to improve kinematics, otherwise ignore this message.
C214A2	The Kinematic Calibration checksum does not match the Shoulder checksum	The calibration checksum stored in the calibration.conf does not match the values from the joint(s)	If moving a program from a different robot to this one, re-kinematic calibrate the second robot to improve kinematics, otherwise ignore this message.

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C214A3	The Kinematic Calibration checksum does not match the Elbow checksum	The calibration checksum stored in the calibration.conf does not match the values from the joint(s)	If moving a program from a different robot to this one, re-kinematic calibrate the second robot to improve kinematics, otherwise ignore this message.
C214A4	The Kinematic Calibration checksum does not match Wrist 1 checksum	The calibration checksum stored in the calibration.conf does not match the values from the joint(s)	If moving a program from a different robot to this one, re-kinematic calibrate the second robot to improve kinematics, otherwise ignore this message.
C214A5	The Kinematic Calibration checksum does not match for Wrist 2 checksum	The calibration checksum stored in the calibration.conf does not match the values from the joint(s)	If moving a program from a different robot to this one, re-kinematic calibrate the second robot to improve kinematics, otherwise ignore this message.
C214A6	The Kinematic Calibration checksum does not match for Wrist 3 checksum	The calibration checksum stored in the calibration.conf does not match the values from the joint(s)	If moving a program from a different robot to this one, re-kinematic calibrate the second robot to improve kinematics, otherwise ignore this message.
C215A	Kinematic Calibration does not match the robot	The calibration checksum stored in the calibration.conf does not match the values from the joints	Check if the serial number of the robot arm matches the Control Box
C216A	The offset of the joint has changed		The joint has been zeroed by the user. Perform a kinematic calibration to improve kinematics if needed.
C216A1	Base		The joint has been zeroed by the user. Perform a kinematic calibration to improve kinematics if needed.
C216A2	Shoulder		The joint has been zeroed by the user. Perform a kinematic calibration to improve kinematics if needed.

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C216A3	Elbow		The joint has been zeroed by the user. Perform a kinematic calibration to improve kinematics if needed.
C216A4	Wrist 1		The joint has been zeroed by the user. Perform a kinematic calibration to improve kinematics if needed.
C216A5	Wrist 2		The joint has been zeroed by the user. Perform a kinematic calibration to improve kinematics if needed.
C216A6	Wrist 3		The joint has been zeroed by the user. Perform a kinematic calibration to improve kinematics if needed.
C217A	Blank space detected at the beginning of a string	Leading blank spaces in strings are ignored in this version	Make sure that these leading blank spaces are intentional otherwise remove them
C218A	A thread used a lot of time	There may be an infinite loop or other command that does not move the robot, this can cause program overload	Add a Wait command or sync() script to split long program sequences and have sequenced processing time
C218A0	Main Robot Program used a lot of time		Use a wait command or sync() script
C218A1	A thread used a lot of time		Use a wait command or sync() script
C219	Change in offset is too high	Following the specified offsets would result in the robot exceeding safety limits	
C219A1	Close to joint speed safety limit		Review program speed and acceleration
C219A2	Close to tool speed safety limit		Review program speed and acceleration
C219A3	Close to momentum safety limit		Review program speed and acceleration
C220A1	Kinematic Calibration	Actual version on the robot arm is not supported	Update Software
C220A2	Kinematic Calibration	Kinematic Calibration file was replaced with file from the arm	Update Software

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C220A3	Kinematic Calibration	Kinematic Calibration uploaded to the arm	Update Software
C220A4	Kinematic Calibration	Kinematic Calibration reuploaded to the arm	Update Software
C257A	Unknown message		
C258A	Invalid Payload		Please insert a valid payload
C259A	Filesystem related issue		
C259A0 to C259A81	Critical error	A critical error occurred in the filesystem	a) Do a Complete rebooting sequence b) Update robot Software c) Reimage SD card d) Contact your local Universal Robots service provider for assistance.
C260A	Brake Release	Brake release not responding properly	a) Check the brake release system b) Do a Complete rebooting sequence c) Contact your local Universal Robots service provider for assistance.
C260A0	Critical error	A critical error occurred during Brake Release	a) Do a Complete rebooting sequence b) Ensure the mounted payload, TCP and CoG matches your configuration. c) Update robot software d) For further assistance, contact your local Universal Robots service provider.
C260A1 to C260A21	Brake Release	Motor moved only	
C261A	Temperature Sensor		
C261A0 to C261A3	Critical error	A critical error occurred in the temperature sensor	a) Do a Complete rebooting sequence b) Contact your local Universal Robots service provider for assistance.

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C261A4 to C261A15	Temperature is too high (degrees Celsius)	Ambient temperature is too high or low. Temperature sensor read a temperature outside the allowed range.	a) Check robot's environment and make sure the robot is operating within recommended limits. b) Do a Complete rebooting sequence
C262A	Communication		
C262A0 to C262A18	Critical error	A critical error occurred in the communication framework	a) Check communications external and internal b) Do a Complete rebooting sequence c) Check for ESD noise d) Update software e) Contact your local Universal Robots service provider for assistance.
C263A	Motor Encoder		
C263A0 to C263A31	Critical error on Motor Encoder	A critical error occurred in the Motor Encoder.	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C264A	Task Manager		
C264A0 to C264A11	Critical error on Task Manager	A critical error occurred in the task manager. Overload of the task manager.	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C265A	Joint Encoder		
C265A0 to C265A30	Critical error on Joint encoder	A critical error occurred in the Joint Encoder	a) Do a Complete rebooting sequence b) Update robot's software c) Check for ESD noise d) Update software e) Contact your local Universal Robots service provider for assistance.

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C267A	Bootloader error	Corrupted firmware	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C267A0 to C267A11	Critical error on Bootloarder	A critical error occurred during Firmware upgrade. Hardware configuration mismatch.	Check your image, SCB, MB or TP for bootloader fixes. Update software.
C268A0	Special Command	Received unhandled command cmd	
C268A1	Special Command	Recieved Set Zero Command at too high speed	
C269A	Transceiver	Fieldbus transmitting and receiving of information failed	
C269A0 to C269A70	Transceiver		
C271	Low-level runtime thread	Process running behind	a) Check that the program and client interface is not taking unnecessary resources.
C271A1 to C271A5	Runtime is too much behind	One of the threads might be using too much time	Consider using a Wait or sync () to split long program sequences that do not move the robot.
C272A	Missing joint calibration		
C272A0 to C272A6	Critical error - the calibration is missing	calibration could not be loaded	a) Update software b) Contact your local Universal Robots service provider for assistance.
C273A	Cross monitoring		
C273A0	Critical error	A critical disagreement error occurred in the safety system	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.

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C273A1	Cross monitoring	Float value on A-side	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C273A2	Cross monitoring	Float value on B-side	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C273A3	Cross monitoring	Unsigned value on A-side	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C273A4	Cross monitoring	Unsigned value on B-side	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C273A5	Disagreement on Safety Control Board State	A critical disagreement occurred within the safety system.	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C273A6	Disagreement on Robot State	A critical disagreement occurred within the safety system.	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C273A7	Disagreement on Safety State	A critical disagreement occurred within the safety system	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.

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C273A8	Disagreement on position	A critical disagreement occurred within the safety system	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C273A9	Disagreement on velocity	A critical disagreement occurred within the safety system	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C273A10	Disagreement on current	A critical disagreement occurred within the safety system	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C273A11	Disagreement on temperature	A critical disagreement occurred within the safety system	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C273A12	Disagreement on Teach Pendant State	A critical disagreement occurred within the safety system	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C273A13	Disagreement on Teach Pendant Emergency Stop	A critical disagreement occurred within the safety system	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C273A14	One processor entered Fault State	A critical disagreement occurred within the safety system	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.

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C273A15	One processor entered Violation State	A critical disagreement occurred within the safety system	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C273A16	Joint State disagreement	A critical disagreement occurred within the safety system	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C273A17	Joint Constant Data CRC disagreement	A critical disagreement occurred within the safety system	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C273A18	Joint target current disagreement	A critical disagreement occurred within the safety system	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C273A19	Torque Window disagreement	A critical disagreement occurred within the safety system	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C273A20	Torque Error disagreement	A critical disagreementoccurred within the safety system	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C273A21	Target Velocity disagreement	A critical disagreement occurred within the safety system	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.

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C273A22	Target Acceleration disagreement	A critical disagreement occurred within the safety system	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C273A23	Recovery Mode CRC disagreement	A critical disagreement occurred within the safety system	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C273A24	Robot Configuration CRC disagreement	A critical disagreement occurred within the safety system	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C273A25	User Configuration CRC disagreement	A critical disagreement occurred within the safety system	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C273A26	Maximum stopping time disagreement	A critical disagreement occurred within the safety system	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C273A27	Stopping Time Torque Overload disagreement	A critical disagreement occurred within the safety system	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C273A28	Disagreement error on a specific joint	A critical disagreement occurred within the safety system	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.

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C273A29	Tool speed disagreement	A critical disagreement occurred within the safety system	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C273A30	Safety Mode Limit disagreement	A critical disagreement occurred within the safety system	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C273A31	Hand Protection Distance disagreement	A critical disagreement occurred within the safety system	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C273A32	Elbow Sphere speed disagreement	A critical disagreement occurred within the safety system	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C273A33	Momentum disagreement	A critical disagreement occurred within the safety system	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C273A34	Power disagreeement	A critical disagreement occurred within the safety system	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C273A35	Elbow position disagreement	A critical disagreement occurred within the safety system	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.

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C273A36	Workpiece Rotation disagreement	A critical disagreement occurred within the safety system	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C273A37	Disagreement on Workpiece Position	A critical disagreement occurred within the safety system	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C273A38	Disagreement on motor parameter (R_ pp)	A critical disagreement occurred within the safety system	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C273A39	Disagreement on motor parameter (L_ pp)	A critical disagreement occurred within the safety system	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C273A40	Disagreement on motor parameter (Kb)	A critical disagreement occurred within the safety system	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C273A41	Disagreement on motor parameter (Kt)	A critical disagreement occurred within the safety system	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C273A42	Disagreement on motor parameter (T)	A critical disagreement occurred within the safety system	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.

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C273A43	Disagreement on the Teach Pendant's Three-Position Enabling Device	A critical disagreement occurred within the safety system	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C273A44	Disagreement on the active status of the Teach Pendant's Three-Position Enabling Device	A critical disagreement occurred within the safety system	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C273A45	Cross monitoring	Disagreement on user safety configuration version, major	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C273A46	Cross monitoring	Disagreement user safety configuration version, minor	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C273A47	Disagreement on state	A critical disagreement occurred within the safety system	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C273A48	Disagreement on Injection-Molding-Machine-Interface Emergency Stop input	A critical disagreement occurred within the safety system	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C273A49	Disagreement on Injection-Molding-Machine-Interface Emergency Stop output	A critical disagreement occurred within the safety system	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.

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C273A50	Disagreement on Injection-Molding-Machine-Interface Safeguard input	A critical disagreement occurred within the safety system	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C273A51	Disagreement on Injection-Molding-Machine-Interface type	A critical disagreement occurred within the safety system	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C273A52	Disagreement on Torque Parameters CRC	A critical disagreement occurred within the safety system	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C273A53	Target Torque disagreement	A critical disagreement occurred within the safety system	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C273A54	Cross monitoring	Disagreement on hardware configuration CRC	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C273A55	Cross monitoring	Disagreement on compensation current	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C273A56	Cross monitoring	Disagreement on external torque target	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C274A1	Control box fan error	Fan is not running	
C274A2	Control box fan error	Monitoring data timed out	

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C274A3	Control box fan error	Check Fan speed	
C275A0 to C275A6	Brake release		Check payload settings. Check for robot stuck.
C276A	Uart between microprocessor		
C276A0 to C276A14	Critical error	A critical error occurred in the UART driver	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C277A1 to C277A11	Memory	Memory allocation	Release some memory from the programs or check URCap or too much files in the robot
C278A	Servo in Joint A processor		
C278A0 to C278A13	Critical error	A critical error occurred in the servo module	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C279A	Flash in joint		
C279A0 to C279A20	Critical error	A critical error occurred in the flash driver	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C280A	Real-time error		
C280A0 to C280A9	Critical error	A critical real-time error occurred	a) Do a Complete rebooting sequence b) Update software c) Check communication between joints d) Contact your local Universal Robots service provider for assistance.
C281A	Robot State Machine		

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C281A0	Critical error	A critical State Machine error occurred	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C281A1	Robot State Machine	An invalid transition occurred in the code	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C281A2	Robot State Machine	An invalid Robot State occured	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C281A3	Joint entered the Fault State		a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C281A4	Joint entered the Violation State		a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C281A5	Robot State Machine	Shutdown took too long, check robot voltage	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C281A6	Robot State Machine	Moved to an unhandled state	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.

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C281A7	Teach Pendant entered the Fault State		a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C281A8	Teach Pendant entered the Violation State		a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C281A9	Joint moved too far before robot entered RUNNING State	A Joint moved more than the permissible range during the Brake Release procedure.	a) Do a Complete rebooting sequence b) Ensure the mounted payload, TCP and CoG matches your configuration. c) Update software d) Contact your local Universal Robots service provider for assistance.
C281A10	Robot State Machine	Failed to power on the Robot arm	a) Do a Complete rebooting sequence b) Ensure the mounted payload, TCP and CoG matches your configuration. c) Update software d) Contact your local Universal Robots service provider for assistance.
C281A11	Robot State Machine	Caused by specified joint	a) Do a Complete rebooting sequence b) Ensure the mounted payload, TCP and CoG matches your configuration. c) Update software d) Contact your local Universal Robots service provider for assistance.

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C281A12	Robot State Machine	Caused by specified state	a) Do a Complete rebooting sequence b) Ensure the mounted payload, TCP and CoG matches your configuration. c) Update software d) Contact your local Universal Robots service provider for assistance.
C281A13	Robot State Machine	Check aggregate joint mode status	a) Do a Complete rebooting sequence b) Ensure the mounted payload, TCP and CoG matches your configuration. c) Update software d) Contact your local Universal Robots service provider for assistance.
C281A14	IMMI entered the Fault State		a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C281A15	IMMI entered the Violation State		a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C282A1	Systick	Systick Sync: SoC frequency synchronization started	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C282A2	Systick	Systick Sync: SoC frequency synchronization in progress, sample number x of 16 unexpected	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.

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C282A3	Systick	Systick Sync: SoC frequency synchronization in progress, received 'SoC period' unexpected sample	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C282A4	Systick	Systick Sync: SoC frequency synchronization in progress, received 'SoC ISR Latency' unexpected sample	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C282A5	Systick	Systick Sync: unexpected SoC period	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C282A6	Systick	Systick Sync: unexpected SysTick timer LOAD value [cpu-clock-cycles]	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C282A7	Systick	Systick Sync: SoC frequency synchronization finished	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C282A8	Systick	Systick Sync: SoC Phase synchronization started	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C282A9	Systick	Systick Sync: SoC Phase error	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.

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C282A10	Systick	Systick Sync: unexpected estimated Systick counter value at SoC	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C282A11	Systick	Systick Sync: unexpected estimated Systick counter ticks to next SoC	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C282A12	Systick	Systick Sync: SoC Phase synchronization finished	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C282A13	Systick	The internal SoC count value has been resynchronized with the FPGA SoC count.	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C282A14	Systick	SOC status data failed to update in a timely manner	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C283A	Safety system		
C283A0	Critical error	A critical error occurred in the safety system	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C283A1	Robot is not braking when in Stop Mode		
C283A2	Robot is moving when in Stop Mode		
C283A3	Power not removed from the motors while in Emergency Stop		

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C283A4	Failed to power on the Robot arm		
C283A5	Invalid pin-configuration received		
C283A6	Trying to reassign pin configuration with specified configuration		
C283A7	Joint exceeded the velocity limit		
C283A8	The System Emergency Stop Output is not active	Failed to activate the System Emergency Stop Output. The output is active when voltage is low	a) Make sure output is not short circuited to a power supply
C283A9	System Emergency Stop Output disagreement within the safety system	The input signals are not switching simultaneously or are incorrectly connected.	a) Ensure both inputs are properly connected b) Contact your local Universal Robots service provider for assistance.
C283A10	Robot Emergency Stop Input disagreement within the safety system	The input signals are not switching simultaneously or are incorrectly connected.	a) Ensure both inputs are properly connected b) Contact your local Universal Robots service provider for assistance.
C283A11	System Emergency Stop Input disagreement within the safety system	The input signals are not switching simultaneously or are incorrectly connected.	a) Ensure both inputs are properly connected b) Contact your local Universal Robots service provider for assistance.
C283A12	Safeguard Stop Input disagreement within the safety system	The input signals are not switching simultaneously or are incorrectly connected.	a) Ensure both inputs are properly connected b) Contact your local Universal Robots service provider for assistance.
C283A13	Safeguard Reset Input disagreement within the safety system	The input signals are not switching simultaneously or are incorrectly connected.	a) Ensure both inputs are properly connected b) Contact your local Universal Robots service provider for assistance.

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C283A14	Operation Mode input disagreement within the safety system.	The input signals are not switching simultaneously or are incorrectly connected.	a) Ensure both inputs are properly connected b) Contact your local Universal Robots service provider for assistance.
C283A15	Three-Positional Enabling Device Input disagreement within the safety system	The input signals are not switching simultaneously or are incorrectly connected.	a) Ensure both inputs are properly connected b) Contact your local Universal Robots service provider for assistance.
C283A16	Safety system	Operation Mode Switch is defined and no Three-Positional Device is defined.	a) Ensure both inputs are properly connected b) Contact your local Universal Robots service provider for assistance.
C283A17	Lost several Teach Pendant safety packages in a row		a) Check that the teach pendant is proper connected b) Do a Complete rebooting sequence c) Update software c) Contact your local Universal Robots service provider for assistance.
C283A18	Lost too many Joint safety packages in a row.		a) Check that the joints are proper connected b) Do a Complete rebooting sequence c) Update software c) Contact your local Universal Robots service provider for assistance.
C283A19	Safety system	Incorrect gravity vector sent from the controller	a) Check that the joints are proper connected b) Do a Complete rebooting sequence c) Update software c) Contact your local Universal Robots service provider for assistance.

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C283A20	Safety system	Wrong payload mass sent from the controller	a) Check that the joints are proper connected b) Do a Complete rebooting sequence c) Update software c) Contact your local Universal Robots service provider for assistance.
C283A21	Safety system	Wrong payload center of gravity sent from the controller	a) Check that the joints are proper connected b) Do a Complete rebooting sequence c) Update software c) Contact your local Universal Robots service provider for assistance.
C283A22	Teach Pendant is connected while it is disabled in robot configuration	If the Teach Pendant is enabled, it is connected. If it is disabled, it is not connected.	Disconnect the Teach Pendant or enable it in the configuration.
C283A23	Safety system	Lost several safety packages in a row from other safety processor	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C283A24	Safety system	Got several safety packages too early in a row from other safety processor	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C283A25	Safety system	Got a ready message from an unexpected source	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C283A26	Force limitation: exceeded torque window		a) Ensure the mounted payload, TCP and CoG matches your configuration. b) Slow down movements c) Contact your local Universal Robots service provider for assistance.

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C283A27	Mismatch on Robot Configuration CRC between the safety system and PolyScope		a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C283A28	Mismatch on User Configuration CRC between the safety system and PolyScope		a) Do a Complete rebooting sequence b) Make new .installation c) Update software d) Contact your local Universal Robots service provider for assistance.
C283A29	Safety system	Trying to reapply a part of the User Configuraton.	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C283A30	Safety system	Trying to reapply a part of the Robot Configuraton,	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C283A31	Safety system	Trying to reapply normal limits	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C283A32	Safety system	Trying to reapply reduced limits	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C283A33	Safety system	Trying to reapply safety CRC	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.

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C283A34	Error while trying to apply safety configuration		a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C283A35	Reduced Mode Output disagreement within the safety system		a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C283A36	Not Reduced Mode Output disagreement within the safety system		a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C283A37	Robot Moving Output disagreement within the safety system		a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C283A38	Robot Not Stopping Output disagreement within the safety system		a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C283A39	Safety system	Several safety packages were received too late from the SCB processor	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C283A40	Reduced Mode Input disagreement within the safety systems	The input signals are not switching simultaneously or are incorrectly connected.	a) Ensure both inputs are correctly connected. b) Contact your local Universal Robots service provider for assistance.

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C283A41	TCP Velocity violates limits of maximum stopping time		a) Ensure the mounted payload, TCP and CoG matches your configuration. b) Slow down movements c) Check safety setting d) Contact your local Universal Robots service provider for assistance.
C283A42	TCP Velocity violates limits of maximum stopping distance		a) Ensure the mounted payload, TCP and CoG matches your configuration. b) Slow down movements c) Check safety setting d) Contact your local Universal Robots service provider for assistance.
C283A43	Joint moved too quickly toward a Joint position limit		a) Ensure the mounted payload, TCP and CoG matches your configuration. b) Slow down movements c) Check safety setting d) Contact your local Universal Robots service provider for assistance.
C283A44	The tool moved too fast towards an orientation limit		a) Ensure the mounted payload, TCP and CoG matches your configuration. b) Slow down movements c) Check safety setting d) Contact your local Universal Robots service provider for assistance.
C283A45	The Elbow moved too fast towards a safety plane		a) Ensure the mounted payload, TCP and CoG matches your configuration. b) Slow down movements c) Check safety setting d) Contact your local Universal Robots service provider for assistance.

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C283A46	The tool moved too fast towards a safety plane		a) Ensure the mounted payload, TCP and CoG matches your configuration. b) Slow down movements c) Check safety setting d) Contact your local Universal Robots service provider for assistance.
C283A47	Joint position limit exceeded		a) Ensure the mounted payload, TCP and CoG matches your configuration. b) Slow down movements c) Check safety setting d) Contact your local Universal Robots service provider for assistance.
C283A48	Tool position limit exceeded		a) Ensure the mounted payload, TCP and CoG matches your configuration. b) Slow down movements c) Check safety setting d) Contact your local Universal Robots service provider for assistance.
C283A49	Tool orientation limit exceeded		a) Ensure the mounted payload, TCP and CoG matches your configuration. b) Slow down movements c) Check safety setting d) Contact your local Universal Robots service provider for assistance.
C283A50	Elbow position limit exceeded		a) Ensure the mounted payload, TCP and CoG matches your configuration. b) Slow down movements c) Check safety setting d) Contact your local Universal Robots service provider for assistance.

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C283A51	Tool moved with a speed which exceeds the speed limit		a) Ensure the mounted payload, TCP and CoG matches your configuration. b) Slow down movements c) Check safety setting d) Contact your local Universal Robots service provider for assistance.
C283A52	Elbow moved with a speed of which exceeds the speed limit		a) Ensure the mounted payload, TCP and CoG matches your configuration. b) Slow down movements c) Check safety setting d) Contact your local Universal Robots service provider for assistance.
C283A53	Maximum Tool Center Point Speed in Reduced Mode is invalid		Ensure the Reduced Mode Limit is less than or equal to the Normal Mode limit.
C283A54	Maximum Elbow Speed in Reduced Mode is invalid		Ensure the Reduced Mode limit is less than or equal to the Normal Mode Limit.
C283A55	Maximum Joint Speed of a specified joint in Reduced Mode is invalid		Ensure the Reduced Mode Limit is less than or equal to the Normal Mode Limit.
C283A56	Maximum Momentum in Reduced Mode is invalid		Ensure the Reduced Mode Limit is less than or equal to the Normal Mode Limit.
C283A57	Maximum stopping time in Reduced Mode is invalid		Ensure the Reduced Mode Limit is less than or equal to the Normal Mode Limit.
C283A58	Maximum stopping distance in Reduced Mode is invalid		Ensure the Reduced Mode Limit is less than or equal to the Normal Mode Limit.
C283A59	Reduced Mode Output is not active	Failed to activate the Reduced Mode Output. The output is active when voltage is low	Make sure output is not short circuited to a power supply

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C283A60	Reduced Mode Output is not inactive	Failed to deactivate the Reduced Mode Output. The output is inactive when voltage is high	Make sure output is not short circuited to ground
C283A61	Not Reduced Mode Output is not active	Failed to activate the Not Reduced Mode Output. The output is active when voltage is low	Make sure output is not short circuited to a power supply
C283A62	Not Reduced Mode Output is not inactive	Failed to deactivate the Not Reduced Mode Output. The output is inactive when voltage is high	Make sure output is not short circuited to ground
C283A63	Robot is moving while Robot Moving Output is not active	Failed to activate the Robot Moving Output. The output is active when voltage is low	Make sure output is not short circuited to a power supply
C283A64	Tool Direction Vector Length for Normal Mode is not 1.0		Reconfigure Tool orientation
C283A65	Tool Direction Vector Length for Reduced Mode is not 1.0		Reconfigure Tool orientation
C283A66	Robot Momentum exceeds the Momentum limit		
C283A67	Robot Power exceeds the Power limit		
C283A68	Error caused by a specified joint	A critical safety error	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C283A69	Safety system	Float value	
C283A70	Safety system	Unsigned value	
C283A71	Safety system	Safety is disabled but the app type is not MAIN-NS (No Safety)	

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C283A72	The motor configuration sent by the Control Box is invalid	The motor configuration sent is unusable with this firmware revision.	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C283A73	Safe Home Position Output disagreement within the safety system		Review your home position
C283A74	The Safe Home Position Output is active while not allowed	The Safe Home Position Output is active while the robot is not in Safe Home Position	Make sure output is not short circuited to power supply or ground
C283A75	Safety system	The user config versions received differ	
C283A76	Safety system	Controller reported a fault	
C283A77	Safety system	The user config versions is higher than supported	
C283A78	Safety system	The user config versions is lower than supported	
C283A79	Safety system	Safe home position out of range	
C283A80	Safety system	Force limit calculation got an unsupported joint size	
C283A81	The robot configuration specifies an unsupported joint size	The safety system is not certified to work with the specified joint size	Upgrade to a newer software version
C283A82	The connected Teach Pendant type does not match the configuration	The connected Teach Pendant is not the same type as the one selected in the safety configuration	a) Check that the Teach Pendant is properly connected and matches the one in the safety configuration b) Conduct a complete rebooting sequence c) Update software d) Contact your local Universal Robots technical support

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C283A83	The configured Teach Pendant has no Three-Positional Enabling Device	The safety configuration enables the Teach Pendant's Three-Positional Enabling Device, but the configured Teach Pendant does not have a Three-Positional Enabling Device	a) Check that the correct Teach Pendant is selected in the safety configuration b) Conduct a complete rebooting sequence c) Update software d) Contact your local Universal Robots technical support
C283A84	Safety system	Received an invalid Teach Pendant type in the user configuration	
C283A85	Automatic Safeguard Stop Input disagreement within the safety system	The input signals are not switching simultaneously, or are incorrectly connected	a) Ensure both inputs are properly connected b) Contact your local Universal Robots service provider for assistance
C283A86	Automatic Safeguard Reset Input disagreement within the safety system	The input signals are not switching simultaneously, or are incorrectly connected	a) Ensure both inputs are properly connected b) Contact your local Universal Robots service provider for assistance
C283A87	Injection-Molding-Machine-Interface is connected while it is disabled in the robot configuration	If the Injection-Molding-Machine-Interface is enabled, it must be connected. If it is disabled, it must be disconnected	Disconnect the Injection-Molding-Machine-Interface or enable it in the configuration
C283A88	Lost more than allowed Injection-Molding-Machine-Interface safety packages in a row		a) Check that the Injection-Molding-Machine-Interface is properly connected b) Conduct a complete rebooting sequence c) Update software d) Contact your local Universal Robots service provider for assistance

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C283A89	The connected Injection-Molding-Machine-Interface type does not match the configuration	The connected Injection-Molding-Machine-Interface is not the same type as the one selected in the safety configuration	a) Check that the Injection-Molding-Machine-Interface is properly connected and matches the one in the safety configuration b) Conduct a complete rebooting sequence c) Update software d) Contact your local Universal Robots service provider for assistance
C283A90	Invalid Injection-Molding-Machine-Interface type in the user configuration	The configuration provided by the user safety configuration is invalid	a) Ensure the correct IMMI type is selected in the Safety Configuration b) Conduct a complete rebooting sequence c) Update software d) Contact your local Universal Robots service provider for assistance
C283A91	The Injection-Molding-Machine-Interface System Emergency Stop Output is not active	Failed to activate the System Emergency Stop Output on the Injection-Molding-Machine-Interface. The output is active when voltage is high	Make sure output is not short circuited to ground
C283A92	Safety system	Target torque is outside the allowed range	
C283A93	Safety system	Sanity check of target torque is outside the allowed range	
C283A94	Automatic Safeguard Stop input is configured but no Three-Position Enabling device is configured		a) Ensure that a Three-Positional Device is enabled in the Safety Configuration b) Conduct a complete rebooting sequence c) Update software d) Contact your local Universal Robots service provider for assistance
C283A95	IO Data has not been updated before latching it		

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C283A96	Received an invalid IMMI type in the user configuration		
C283A97	Safety system	The payload inertia diagonal sent from the controller must be non-negative	
C283A98	Safety system	The payload inertia sent from the controller must be within valid range	
C283A99	Safety system	Received an invalid value as part of the runtime safety configuration	
C284A	Brake Release		
C284A0 to C284A20	Critical error	A critical error occurred during Brake Release	a) Conduct a complete rebooting sequence b) Ensure the mounted payload, TCP, and CoG matches your configuration c) Check if there is no interference with the joints d) Contact your local Universal Robots service provider for assistance
C285A	Joint Keep-Alive System		
C285A0 to C285A15	Critical error	A critical error occurred in the Joint Keep-Alive System	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C286A	Motor Controller		
C286A1 to C286A2	ME Index seen and PWM margin too small		
C287A	Saved files in tool		
C287A0 to C287A3	Critical error	A critical error occurred during file loading/saving	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C288A	IO Control		

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C288A1 to C288A3	Wrong control mode		Check for configuration under installation window
C289A	Tool Connector		
C289A1	Short circuit detected on Digital Output: high side	Tool Digital Output pin has been turned off due to either a short-circuit or an overload was detected.	Check connections to make sure Tool Digital Output currents are within specified limits.
C289A2	Short circuit detected on Digital Output: low side	Tool Digital Output pin has been turned off due to either a short-circuit or an overload was detected.	Check connections to make sure Tool Digital Output currents are within specified limits.
C289A4	10 second Average tool IO Current is outside of the allowed range.	The average current sum of the Tool Connector Power and Digital Output pins is outside of the allowed range.	Check connections to make sure tool Digital Output currents are within specified limits.
C289A5	Unable to remove tool Digital Output fault.	Unable to remove the overload on tool Digital Output, therefore the robot powered down.	Check connections to make sure the Tool Digital Output currents are within specified limits.
C289A6	Current on the POWER pin is outside of the allowed range.	Too high current on tool connector power pin	Check connections to make sure the Tool Digital Output currents are within specified limits.
C289A7	Current on the Digital Output pins is outside of the allowed range.	Too high current on tool connector Digital Output pins.	Check connections to make sure the Tool Digital Output currents are within specified limits.
C289A8	Current on the ground pin is outside of the allowed range.	Too high current on tool ground pin	Check connections to make sure the Tool Digital Output currents are within specified limits.
C289A9	Maximum current on the POWER pin is outside of the allowed range	Too high current on tool power pin	Check connections to make sure the Tool Digital Output currents are within specified limits.
C290A1	I2C	The I2C bus was busy too long	
C290A2	I2C	Function called too early after last call or the slave chip did not answer	
C290A3	I2C	A peripheral unit has set the alert pin	

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C290A4	I2C	Communication timeout detected	
C290A6	I2C	An error was detected in the i2c acknowledge handshake	
C290A7	I2C	I2C detected arbitration loss	
C290A8	I2C	I2C detected error on the I2C-bus	
C290A9	I2C	I2C error interrupt called with unhandled error-flag	
C290A10	I2C	I2C peripheral issue, several unhandled events	
C291A1	EEPROM	Addressed data is out of memory bounds	
C291A2	EEPROM	I2C communication error	
C291A3	EEPROM	Write to EEPROM failed	
C291A4	EEPROM	Read from EEPROM failed	
C291A5	EEPROM	Verification of written data failed	
C291A6	EEPROM	Difference in data when comparing the source and the data written	
C291A7	EEPROM	Writing of a page in EEPROM failed	
C292A	Online RAM test		
C292A0 to C292A15	Critical error	A critical error occurred during RAM test	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C293A	Exception caught		
C293A1 to C293A30	Unexpected exception/interrupt		a) Do a Complete rebooting sequence b) Update software
C294A	ADC	Analog to Digital converter	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.

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C294A0 to C294A9	Critical error	A critical error occurred in the ADC driver	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C295A	PCB	Wrong PCB type. Likely a hardware error.	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C295A0	Wrong PCB type	The printed circuit board is wrong	
C296A	Start up check		
C296A0	Critical error	A critical error occurred during startup	a) Check 10A fuse b) Do a Complete rebooting sequence c) Update software d) Contact your local Universal Robots service provider for assistance.
C296A1	SCB IO failed to power on		Ensure the IO Power Connector on the Safety Control Board is connected to the 24VDC
C296A2	Start up check	One or more Motor phases is short circuited to ground	
C296A3	Start up check	Motor Indication Signal does not work	
C296A4	Start up check	Phase 1 is not connected.	
C296A5	Start up check	Phase 2 is not connected.	
C296A6	Start up check	Phase 3 is not connected.	
C296A7	Start up check	Motor test results were invalid.	
C296A8	Start up check	Motor PWM output is not zero in Joint State	
C296A9	Start up check	Robot Voltage was present during self-diagnostics	
C296A10	Start up check	Time out during self-diagnostics	

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C296A11	Start up check	Data was received while trying to disable communication	
C296A12	Start up check	Sequence number did not match expected sequence	
C296A13	Start up check	Check the expected sequence number	
C296A14	Start up check	Check the actual sequence number	
C296A15	Start up check	Interval between messages did not match expectations	
C296A16	Start up check	Check the expected interval ticks	
C296A17	Start up check	Check the measured interval ticks	
C296A18	Start up check	Motor Kt value is outside manufacturer specifications	
C296A19	Start up check	Motor Kb value is outside manufacturer specifications	
C296A20	Start up check	Motor R value is outside manufacturer specifications	
C296A21	Start up check	Motor L value is outside manufacturer specifications	
C296A22	Start up check	Processor uB has been in Booting state for too long	
C296A23	Start up check	Cross-monitoring data was invalid for too long while booting	
C296A24	Start up check	Motor Tau value is outside manufacturer specifications	
C297A	Joint validation	Validation during power up.	a) Do a Complete rebooting sequence b) Check that SD card and robot type match. c) Update software d) Contact your local Universal Robots service provider for assistance.

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C297A0	Critical error	A critical error occurred during Joint validation	a) Do a Complete rebooting sequence b) Check that SD card and robot type match. c) Update software d) Contact your local Universal Robots service provider for assistance.
C297A1	Joint validation	Received Node ID from an unexpected device	
C297A2	Joint validation	Received Node ID an unexpected node	
C297A3	Joint validation	Joint processors disagree on Joint Size	
C297A4	Joint validation	Joints disagree with configuration on Joint Size	
C297A5	Joint validation	Found Joint disabled in configuration	
C297A6	Joint validation	Joint processors disagree on Joint ID.	
C297A7	Joint validation	Node ID differs from the stored ID.	
C297A8	Joint validation	Invalid robot configuration	
C297A9	Joint validation	Joint IDs need updating	
C297A10	Joint validation	Timeout while waiting for Node IDs	
C297A11	The Robot arm does not match the Control Box	One or more joints do not match stored Robot Configuration	a) Do a Complete rebooting sequence b) Check that SD card and robot type match. c) Update software d) Contact your local Universal Robots service provider for assistance.
C298A	Hand protection		

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C298A0	Tool is too close to the lower arm	The tool is too close to the lower Robot arm	a) Check wrist position. b) Verify mounting c) Do a Complete rebooting sequence d) Update software e) Contact your local Universal Robots service provider for assistance
C299A	Tool communication		
C299A0	Communication error detected	A problem with the Tool communication was detected.	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C299A1	Tool communication	TX buffer overflow	
C299A2	Tool communication	New message started unexpectedly	
C299A3	RX framing error	Framing error detected on received data	a) Check external equipment connection b) Verify the communication configuration matches the hardware. c) Do a Complete rebooting sequence d) Update software e) Contact your local Universal Robots service provider for assistance
C299A4	RX Parity error	Parity error detected on received data	a) Check external equipment connection b) Verify the communication configuration matches the hardware. c) Do a Complete rebooting sequence d) Update software e) Contact your local Universal Robots service provider for assistance
C299A5	Tool communication	RX buffer overflow.	
C300A1	Safety message	Safety message received from an unexpected node.	

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C300A2	Safety message	Safety message response received with an unexpected sequence number.	
C300A3	Safety message	Duplicate safety message response received with sequence number.	
C301A	Safety message monitor	Safety processors does not agree.	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance
C301A0	Critical error	A critical error occurred in safety message monitoring	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C301A2	Safety message monitor	Mode data mismatch	Same as C301A0
C301A3	Safety message monitor	Position data mismatch	Same as C301A0
C301A4	Safety message monitor	Revolution data mismatch	Same as C301A0
C301A5	Safety message monitor	Temperature data mismatch	Same as C301A0
C301A6	Safety message monitor	Torque data mismatch	Same as C301A0
C301A7	Safety message monitor	Velocity data mismatch	Same as C301A0
C301A8	Safety message monitor	Input state data disagreement	Same as C301A0
C301A10	Safety message monitor	Safety monitor: Don't have the corresponding x-mon data	Same as C301A0
C301A12	Safety message monitor	Target current data mismatch	Same as C301A0
C301A14	Safety message monitor	Target Velocity data mismatch	Same as C301A0
C301A15	Safety message monitor	Target Acceleration data mismatch	Same as C301A0

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C301A16	Safety message monitor	Issue with setting up the UART mon RX address in TP	Same as C301A0
C301A17	Safety message monitor	Issue with setting up the UART mon RX CITER register in TP	Same as C301A0
C301A18	Safety message monitor	Issue with setting up the UART mon RX BITER register in TP	Same as C301A0
C301A19	Safety message monitor	Issue with setting up the MK02 UART TX, address is incorrect	Same as C301A0
C301A20	Safety message monitor	Issue with setting up the MK02 UART TX, CITER REG is incorrect	Same as C301A0
C301A21	Safety message monitor	Issue with setting up the MK02 UART TX, BITER REG is incorrect	Same as C301A0
C301A25	Safety message monitor	Node uA's communication to SCB disabled	Same as C301A0
C301A26	Safety message monitor	Motor parameter (R_pp) data mismatch	Same as C301A0
C301A27	Safety message monitor	Motor parameter (L_pp) data mismatch	Same as C301A0
C301A28	Safety message monitor	Motor parameter (Kb) data mismatch	Same as C301A0
C301A29	Safety message monitor	Motor parameter (Kt) data mismatch	Same as C301A0
C301A30	Safety message monitor	Motor parameter (T) data mismatch	Same as C301A0
C301A31	Safety message monitor	Safety Message was not received	Same as C301A0
C301A32	Safety message monitor	Function indicating if we should monitor data is not configured	Same as C301A0
C301A33	Safety message monitor	Function to parse messages is not configured	Same as C301A0
C301A34	Safety message monitor	Function to handle messages is not configured	Same as C301A0
C301A35	Safety message monitor	Function to handle disable communication requests is not configured	Same as C301A0

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C301A36	Safety message monitor	IMMI Safety IO estop input mismatch	Same as C301A0
C301A37	Safety message monitor	IMMI Safety IO estop output mismatch	Same as C301A0
C301A38	Safety message monitor	IMMI Safety IO safeguard input mismatch	Same as C301A0
C301A39	Safety message monitor	Target torque data mismatch	Same as C301A0
C301A40	Safety message monitor	compensation current mismatch	Same as C301A0
C302A	Tool configuration		Please check your configuration on the installation tab
C302A1	Invalid Robot Type	The tool received an invalid robot type	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance
C303A	System status		a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance
C303A0	Critical error	A critical system error occurred	Same as C303A
C303A1	System status	Starting up	Same as C303A
C303A2	System status	Shutting down	Same as C303A
C303A3	System status	Reset caused by unknown reasons	Same as C303A
C303A4	System status	Reset caused by power loss	Same as C303A
C303A5	System status	Reset caused by window watchdog	Same as C303A
C303A6	System status	Reset caused by independent watchdog	Same as C303A
C303A7	System status	Reset caused by software	Same as C303A
C303A8	System status	Reset caused by power on	Same as C303A
C303A9	System status	Reset caused by reset pin	Same as C303A
C303A10	System status	Reset caused by brown out	Same as C303A

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C303A11	System status	Reset caused by a loss of lock in the PLL	Same as C303A
C303A12	System status	Reset caused by a loss of external clock.	Same as C303A
C303A13	System status	Reset caused by LLWU module wakeup source	Same as C303A
C303A14	System status	Reset caused by peripheral failure to acknowledge attempt to enter Stop Mode	Same as C303A
C303A15	System status	Reset caused by EzPort receiving the RESET command while the device is in EzPort mode	Same as C303A
C303A16	System status	Reset caused by host debugger system setting of the System Reset Request bit	Same as C303A
C303A17	System status	Reset caused by core LOCKUP event	Same as C303A
C303A18	System status	Reset caused by JTAG	Same as C303A
C303A19	System status	Unexpected core frequency configured	Same as C303A
C304A	Self monitoring		
C304A0	Critical error	A critical error occurred in physical, logical, and temporal monitoring (PLATM)	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C304A3	Close to the gearbox shear limit. Encoders disagree on the Joint position	The Joint acceleration or deceleration is too high, or there is a mechanical problem in the gear related to encoder mounting.	a) Reduce acceleration in the user program. b) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance or Replace Joint if necessary.

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C304A4	Either the encoder was inappropriately mounted, or the gearbox is loose or broken. Difference between the encoders is present	Mechanical problem in gear related to encoder mounting.	a) Reduce acceleration in the user program. b) Check TCP/Payload and Cog c) Do a Complete rebooting sequence d) Update software e) Contact your local Universal Robots service provider for assistance or Replace Joint if necessary.
C304A6	Motor phase resistance is too high.	The lead/connector is broken, or the Motor phase lead has become disconnected or loose.	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance
C305A	Robot Power Control		
C305A0	Critical error	A critical error in power control module	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C305A1	Power supply voltage too low	Robot voltage is lower than 40V.	a) Check for loose connections b) Do a Complete rebooting sequence c) Update software d) Contact your local Universal Robots service provider for assistance.
C305A2	Robot cable not connected		a) Make sure the cable between Control Box and Robot Arm is correctly connected and it has no damage. b) Check for loose connections c) Do a Complete rebooting sequence d) Update software e) Contact your local Universal Robots service provider for assistance Contact your local Universal Robots service provider for assistance.

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C305A3	Short circuit in Robot detected or the wrong Robot is connected to the Control Box.		a) Check for loose connections b) Make sure the cable between Control Box and Robot Arm is correctly connected and it has no damage. c) Check for loose connections d) Do a Complete rebooting sequence e) Update software f) Contact your local Universal Robots service provider for assistance.
C305A4	Robot voltage rising slower than expected		a) Verify the power supply voltage b) Verify Control Box and Robot Arm are correctly paired c) Check for loose connections d) Do a complete rebooting sequence e) Contact your local Universal Robots service provider for assistance
C305A5	Robot Power Control	Attempted to start Energy Eater with powered robot	
C305A6	Power supply voltage too high	Power supply is higher than 56V	a) Make sure the cable between Control Box and Robot Arm is correctly connected and it has no damage. b) Check for loose connections c) Do a Complete rebooting sequence d) Update software e) Contact your local Universal Robots service provider for assistance.
C305A7	Robot Power Control	Energy Eater was active when trying to turn on the Robot arm	
C305A8	The Robot Voltage is too high when powering on the Robot		a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.

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C305A9	The Power State was not OFF when trying to power on the Robot		a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance
C305A10	Robot Power Control	The Delay Callback setup failed	
C305A11	The power to the robot arm was not removed fast enough after violation		a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance
C306A	Joint	Joint error	
C306A0	Critical error	A critical error occurred in a Joint	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C306A1	Not stopping fast enough	Joint was unable to come to a full stop fast enough.	a) Either an incorrect payload is mounted, or an external force is pushing the robot b) Do a Complete rebooting sequence c) Update software d) Contact your local Universal Robots service provider for assistance.
C306A2	Joint	Velocity failed to pass sanity check	
C306A3	Joint	Acceleration failed to pass sanity check	
C306A4	Joint	Joint does not have a stored id	
C306A5	Joint	Joint ID could not be stored	
C306A6	Joint	control-package sequence number mismatched with expected sequence number	
C306A7	Joint	Several instances of mismatched control-package sequence numbers within last second	
C306A8	Joint	Sanity check of control-package sequence numbers recovered after detecting bad sequence numbers	

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C306A9	Joint moved more than allowable limit	Potential mechanical failure of the joints brakes	b) Do a Complete rebooting sequence c) Update software d) Contact your local Universal Robots service provider for assistance.
C306A10	Joint	Current detected in motor exceeded limits, check current	
C306A11	Joint	Check PWM duty cycle for motor phase A	
C306A12	Joint	Check PWM duty cycle for motor phase B	
C306A13	Joint	Check PWM duty cycle for motor phase C	
C307A	Data B		
C308A	Data A		
C309	Keep-Alive System		
C309A	Critical error	A critical error occurred in the Keep-Alive System	a) Conduct a complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance
C309A0	Keep-Alive System	Critical error	
C309A1	Keep-Alive System	Keep-Alive System message with wrong sequence received from SCB-uPA.	
C309A2	Keep-Alive System	Timeout reached while waiting for a Keep-Alive System message from SCB-uPA.	
C309A3	Keep-Alive System	Go-to-Fault command received a Keep-Alive System message from SCB-uPA.	
C309A4	Keep-Alive System	A Keep-Alive System message with wrong sequence received from SCB-uPB.	

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C309A5	Keep-Alive System	Timeout reached while waiting for Keep-Alive System message from SCB-uPB.	
C309A6	Keep-Alive System	Go-to-Fault command received in Keep-Alive System message from SCB-uPB.	
C309A7	Keep-Alive System	Keep-Alive System message received from an unauthorized source	
C309A8	Keep-Alive System	uPA handler received an invalid value	
C309A9	Keep-Alive System	uPB handler received an invalid value	
C309A10	Lost more than allowed Keep-Alive System messages in a row from Safety Control Board-uPA	An invalid amount of Keep-Alive System messages have been lost from the Safety Control Board Processor A	a) Conduct a complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance
C309A11	Lost more than allowed Keep-Alive System messages in a row from Safety Control Board-uPB	An invalid amount of Keep-Alive messages have been lost from the Safety Control Board Processor B	a) Conduct a complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance
C309A12	Keep-Alive System	Go-to-Violation command received in Keep-Alive System message from SCB-uPA.	
C309A13	Keep-Alive System	Go-to-Violation command received in Keep-Alive System message from SCB-uPB.	
C309A14	Keep-Alive System	Invalid command received in Keep-Alive System message from SCB-uPA.	
C309A15	Keep-Alive System	Invalid command received in Keep-Alive System message from SCB-uPB.	
C311A0	Delay Callback	The timer is not available	

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C312A	Data validation		
C312A0	Critical error	A critical error occurred during data validation	a) Do a Complete rebooting sequence b) Check for ESD noise. c) Update software d) Contact your local Universal Robots service provider for assistance.
C312A1	Data validation	Missed several packages	
C312A2	Data validation	Unexpected sequence	
C312A3	Data validation	Several failures in a row	
C312A4	Data validation	Received a package at an unexpected time	
C312A5	Data validation	Package had unexpected type	
C313A0	App version	Check build version	
C313A1	App version	Check git sha	
C313A2	App version	Check CRC code	
C313A3	App version	Check build major version	
C313A4	App version	Check build minor version	
C313A5	App version	Check build patch version	
C314A	SPI IO	IO sanity check error.	
C314A0	Critical error	A critical error occurred related to IO	a) Do a Complete rebooting sequence b) Check IO connections c) Update software d) Contact your local Universal Robots service provider for assistance.
C314A1	SPI IO	Control bits read wrongly	
C314A2	SPI IO	Output readback does not match the produced value	
C314A3	SPI IO	Safeguard bit transition to low	
C314A4	SPI IO	Emergency Stop bit transition to low	

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C314A5	Expected OSSD pulse were not detected on the Configurable Output (CO)	The generated OSSD pulses on the safety output were not seen during readback	a) Verify if safety output is not connected to any power supply or another safety output b) Update software c) Contact your local Universal Robots service provider for assistance
C314A6	An unexpected OSSD pulse was detected on Configurable Output (CO)	An OSSD pulse was detected on the safety output readback, but was not generated by the hardware	a) Verify if safety output is not connected to ground or another safety output b) Update software c) Contact your local Universal Robots service provider for assistance
C315A	Watchdog	The system watchdog is not working as expected	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C315A0 to C315A23	Self-test failed	The system watchdog is not working as expected	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C316A	MCU	Micro Control Unit	
C316A0	Unknown ID	The Microcontroller Identifier does not match an expected value. Firmware does not match hardware.	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance
C316A1	This version of the firmware is obsolete and needs to be updated	The firmware in the robot is too old and needs to be updated	a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance.
C317A0	Failure injection	Injecting type unexpected	
C317A1	Failure injection	Missing handler for specified type	
C317A2	Failure injection	Invalid data provided to specified type	

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C317A3	Failure injection	Throw report	
C318A0	Stack monitor	The stack level watermark is breached	
C319A0	Filesys Diagnostic Tool	Read operation started, at specified start address	
C319A1	Filesys Diagnostic Tool	Read operation was succesfully completed	
C319A2	Filesys Diagnostic Tool	Read operation failed, due to illegal address	
C319A3	Filesys Diagnostic Tool	Received data for unexpected address	
C319A4	Filesys Diagnostic Tool	Unxpected address	
C319A5	Filesys Diagnostic Tool	Erased sector at specified address	
C319A6	Filesys Diagnostic Tool	Write operation was succesfully completed	
C320A0 to C320A41	REDnet BLVDS	Data transmission error	
C321A0 to C321A41	REDnet RS485	Data transmission error	
C322A0	Switch	Switch : Priority package timeout on specified ports	
C322A1	Switch	Switch : Data package timeout on specified ports	
C323A0	SCB Endpoint	Endpoint : Priority data debug channel overflow	
C323A1	SCB Endpoint	Endpoint : data debug channel overflow	
C323A2	SCB Endpoint	Endpoint : Priority data inbound timeout from specified port.	
C323A3	SCB Endpoint	Endpoint : Data inbound timeout from specified port.	
C323A4	SCB Endpoint	Endpoint : Priority data outbound timeout to specified port.	
C323A5	SCB Endpoint	Endpoint : Data outbound timeout to specified port.	
C324A0	TP UART	UART : FiFo overflow	

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C324A1	TP UART	UART : Length mismatch	
C324A2	TP UART	UART : Unexpected SOM	
C325A53 to C335A66	SPI uA	uA SPI : Unsupported command	
C327A0	PCIe	PCIe Control-Data : Blocked	
C327A1	PCIe	PCIe Priority-Data : Blocked	
C327A2	PCIe	PCIe data-data : Blocked	
C328A	Transceiver miscellaneous		
C328A0	Transceiver miscellaneous	The SoC arrived too early	
C328A1	Transceiver miscellaneous	Timeout while waiting for the SoC, the SoC was lost or delayed more than expected	
C328A2	Flash device is not supported, check JEDEC data for device	The flash device's JEDEC ID does not match a supported flash device	a) Conduct a complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance
C329A1	AXI STREAM	FiFo overflow on interface	
C329A2	AXI STREAM	FiFo overflow cleared	
C330A	Injection Molding Machine Interface IMMI IO		
C330A1	Injection-Molding-Machine-Interface E-Stop output readback does not match the produced value	First byte: produced value, second byte: read value	Check E-stop output
C330A2	Injection-Molding-Machine-Interface Moulding Area Free output readback does not match the produced value	First byte: produced value, second byte: read value	Check output

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C330A3	Injection-Molding-Machine-Interface 24V IO voltage outside acceptable range	The voltage measured on the 24V IO rail is lower than expected	a) Check the fuses on the Injection-Molding-Machine-Interface b) Verify there are no short circuits on the 24V IO connectors c) Contact your local Universal Robots service provider for assistance
C330A4	Injection-Molding-Machine-Interface 48V voltages outside acceptable range	The voltages measured on the 48V rails are lower than expected	a) Check the fuses on the Injection-Molding-Machine-Interface b) Verify there are no short circuits on the IO connectors c) Contact your local Universal Robots service provider for assistance
C331A	Friction model		
C331A0	Critical error	A critical error occurred in the friction model module	a) Conduct a complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance
C332A	Servo configuration		
C332A0	Critical error on Servo configuration	A critical error occurred in the servo configuration module	a) Conduct a complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance
C332A1	Servo configuration	The configuration file could not be loaded	
C332A2	Servo configuration	The configuration file could not be updated	
C332A3	Servo configuration	Failed to create configuration file, due to unknown PCB_ type	
C332A4	Servo configuration	Failed to acquire the motor datasheet, due to unsupported motor	
C333A0	File message	Critical error	
C333A1	File message	File type is not supported	

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C333A2	File message	All arguments are mandatory	
C333A3	File message	Protocol version is not supported	
C333A4	File message	File part is unexpected	
C333A5	File message	CRC is invalid	
C333A6	File message	Unexpected CRC value	
C333A7	File message	Unique ID is invalid	
C333A8	File message	Unexpected unique ID	
C333A9	File message	File version is not supported	
C333A10	File message	File ID is deleted	
C334A	Protective Stop: Position deviation while in Locked Axis feature	Robot deviated from constrained axes while in Constrained Freedrive. The maximum range was reached.	a) Unlock constrained axis b) Move robot back to reachable postions
C336A1	Hardware configuration manager	An illegal write request to a memory area	
C337A0	Control parameters	Critical error	
C337A1	Control parameters	A selected set of control parameters was not allowed in this application	
C337A2	Control parameters	A selected set of control parameters was not known or was incorrectly applied	
C400A	Protective Stop: Elbow position close to safety plane limits	Robot joint 2 - Elbow has reached the Safety Plane limits	Move robot Elbow joint away from the safety plane
C401A	Protective Stop: Exceeding user safety settings for stopping time	You have exceeded the safety settings, watch out for high values not allowed in the robot	a) Check speeds and accelerations in the program b) Check usage of TCP, payload and CoG correctly c) Check external equipment activation if correctly set
C402A	Protective Stop: Exceeding user safety settings for stopping distance	Protective Stop activated by the stopping distance set in the safety settings. The value was higher so the robot stopped preventing higher distance of stop	Same as C401A

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C403A	Protective Stop: Danger of clamping between the Robot's lower arm and tool	Robot has entered Protective Stop due to reach maximum point to prevent a clamp situation between joint and robot itself	Same as C401A
C404A	Unexpected behavior		
C404A0	Runtime sends data too often	Communication overload	a) Check external equipment communication frequency b) Check if wait command or sync() script code are used in the program
C404A1	Runtime tries to receive data too often	Communication overload	Same as C404A0
C450A	Force-Torque sensor		
C450A0	Sensor data invalid	Force-Torque sensor is defective or not mounted correctly	a) Do a Complete rebooting sequence b) Check for loose connections c) Update software d) Contact your local Universal Robots service provider for assistance.
C450A1	Sensor cannot be used, therefore it is disabled	Force-Torque sensor version is newer than the Robot software	Same as C450A0
C450A2	Force-Torque sensor	Channel signal became invalid	
C450A3	Force-Torque sensor	Check frequency	
C450A4	Force-Torque sensor is expected, but it cannot be detected	Force-Torque sensor is expected, but no signals from the sensor can be detected.	a) Do a Complete rebooting sequence b) Check for loose connections c) Check for damages to the Tool/sensor d) Update software e) Contact your local Universal Robots service provider for assistance.
C450A5	Force-Torque sensor is detected but not calibrated	Force-Torque sensor is installed, but no calibration was found	Same as C450A5

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C499A	Motor encoder calibration status		a) Conduct a complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance
C499A0	Actual position isn't final. Position error	Motor encoder calibration status	Same as C499A
C499A1	Actual position has an error. Position error	Motor encoder calibration status	Same as C499A
C499A2	Actual position has a an error and isn't final. Position error	Motor encoder calibration status	Same as C499A
C499A3	Target position	Motor encoder calibration status	Same as C499A
C499A4	Actual average position	Motor encoder calibration status	Same as C499A
C499A5	Actual position variance	Motor encoder calibration status	Same as C499A
C499A6	Actual position min to max delta	Motor encoder calibration status	Same as C499A
C499A7	Actual sample position number	Motor encoder calibration status	Same as C499A
C720A2	LVD (low voltage detection)	Low Voltage warning level reached	Same as C720A
C710A	ROM Test		a) Do a complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance
C710A0	Critical error	A critical error occurred during ROM validation	Same as C710A
C710A1	ROM corrupted	A critical error occurred during ROM validation	Same as C710A
C710A2	Failed to validate CRC on invariant data in RAM	A critical error occurred during ROM validation	Same as C710A
C710A3	Unexpected size of invariant data	A critical error occurred during ROM validation	Same as C710A

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C710A4	Failed to validate CRC on code segment in RAM	A critical error occurred during ROM validation	Same as C710A
C720A	Low Voltage Detection (LVD)		a) Do a Complete rebooting sequence b) Check for loose connections d) Update software e) Contact your local Universal Robots service provider for assistance
C720A0	Reset due to Low Voltage Dectection (LVD) or power off	Voltage needed values is not reaching the necessary values to work. Out of range	Same as C720A
C720A1	Low Voltage warning level reached	Voltage needed values is not reaching the necessary values to work. Out of range	Same as C720A
C740A	Hardware monitoring		a) Do a Complete rebooting sequence b) Update software c) Contact your local Universal Robots service provider for assistance
C740A0	Critical error	A critical error occurred during hardware monitoring	Same as C740A
C740A1	1V2 voltage is outside of the allowed range		Same as C740A
C740A2	1V8 voltage is outside of the allowed range		Same as C740A
C740A3	2V5 voltage is outside of the allowed range		Same as C740A
C740A4	3V3 voltage is outside of the allowed range		Same as C740A
C740A5	PC 3V3 voltage is outside of the allowed range		Same as C740A
C740A6	uA's 3V3voltage is outside of the allowed range		Same as C740A
C740A7	uB's 3V3 voltage is outside of the allowed range		Same as C740A

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C740A8	5V voltage is outside of the allowed range		Same as C740A
C740A9	12V voltage is outside of the allowed range		Same as C740A
C740A10	24V voltage is outside of the allowed range		Same as C740A
C740A11	48V voltage is outside of the allowed range		Same as C740A
C740A12	58V voltage is outside of the allowed range		Same as C740A
C740A13	-4V voltage is outside of the allowed range		Same as C740A
C740A14	Robot voltage is outside of the allowed range		Same as C740A
C740A15	Robot current is outside of the allowed range		Same as C740A
C740A17	Inrush protected 48V voltage is outside of the allowed range		Same as C740A
C740A20	24V SPI IO voltage	24V voltage IO is outside its limits (Below 23,0V above 25,7V)	a) Do a Complete rebooting sequence b) Check for loose connections c) Check for damages to the Tool/sensor d) Update software e) Contact your local Universal Robots service provider for assistance
C740A21	24V SPI IO current	24V current IO is outside its limits	a) Do a Complete rebooting sequence b) Check for loose connections c) Check for damages to the Tool/sensor d) Update software e) Contact your local Universal Robots service provider for assistance
C740A22	The solenoid voltage is not 0 before activation		Same as C740A

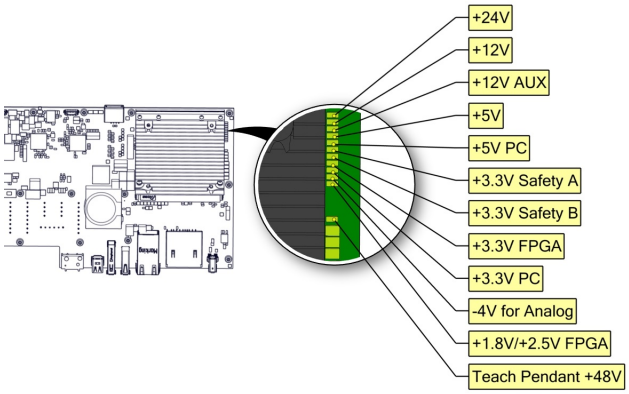
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C740A23	The solenoid voltage is not 48V after activation		Same as C740A
C740A24	The left Three-Position Enabling button is inconsistent	Check for connections problem. Check 3PE functionality	a) Do not press the button repeatedly b) Remove any pressure off the button c) Press the button with more pressure, if light pressing may not work d) Update software e) Contact your local Universal Robots service provider for assistance
C740A25	The right Three-Position Enabling button is inconsistent	Check for connections problem. Check 3PE functionality	Same as C740A24
C740A26	State for the Three-Position Enabling button	Check for connections problem. Check 3PE functionality	Same as C740A24
C900A	Debug message data		

6.4. LED indicators and Fuse on Safety Control Board

6.4.1. LED Indicators on Safety Control Board

The below LEDs are “power” LEDs. They are either on or off.

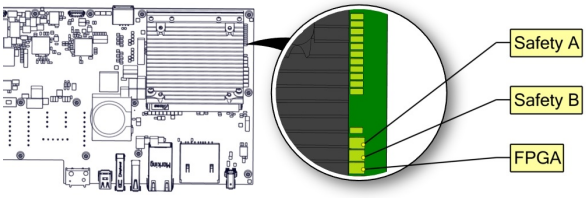


LED for power

- Green color permanent = Power on
- No color permanent = Error or no power

Below are “communication” LEDs. They flash in different patterns, depending on the status.

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LED for Safety A and Safety B

Green fast flash = Bootloader

Green slow flash = Normal communication

Red permanent = Error (Red flash can happen during bootup/power on, this is normal.)

LED for FPGA

Green/Red permanent = Normal communication

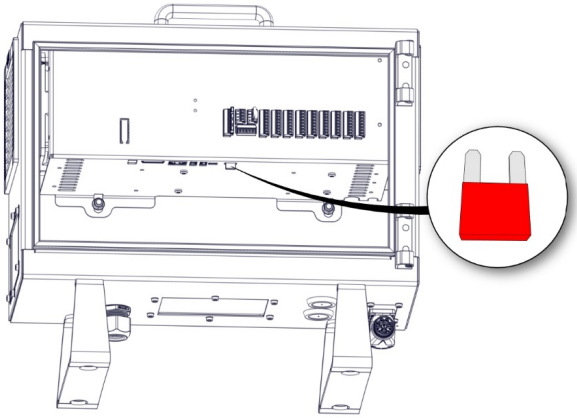
Green slow flash = No communication/trying to establish communication

6.4.2. Fuse

Fuse is a 10A fast-acting mini blade fuse.

WARNING

Never use a different fuse than specified. Only use high grade components.



Fuse specifications:

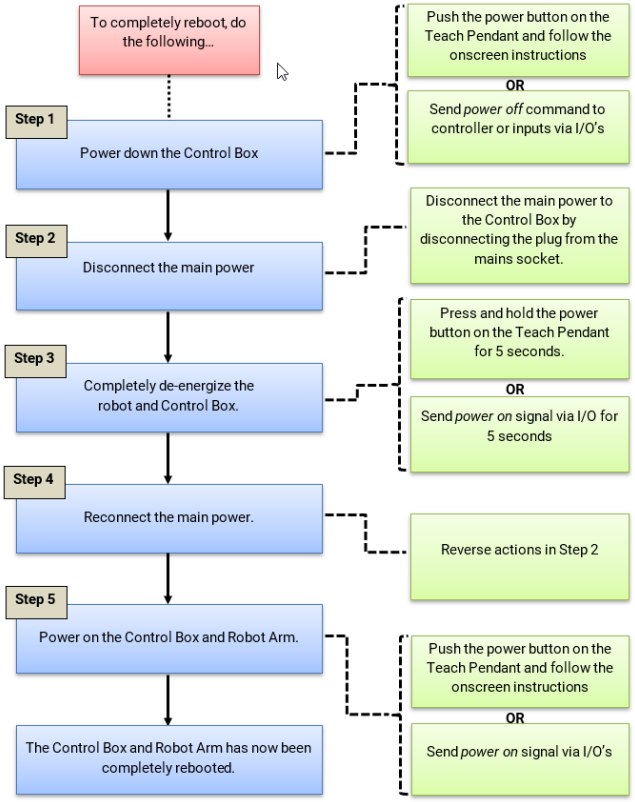
- Interrupting Rating: 1000A @ 32 VDC
- Voltage Rating: 32 VDC
- Component Level Temperature Range: -40˚C to +125˚C
- System Level Temperature Range: -40˚C to +105˚C
- Terminals: Ag plated zinc alloy

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- Housing Material: PA66
- Complies with: SAE J2077, ISO 8820-3
- UL 248 Special Purpose Fuses

6.5. Complete Rebooting Sequence

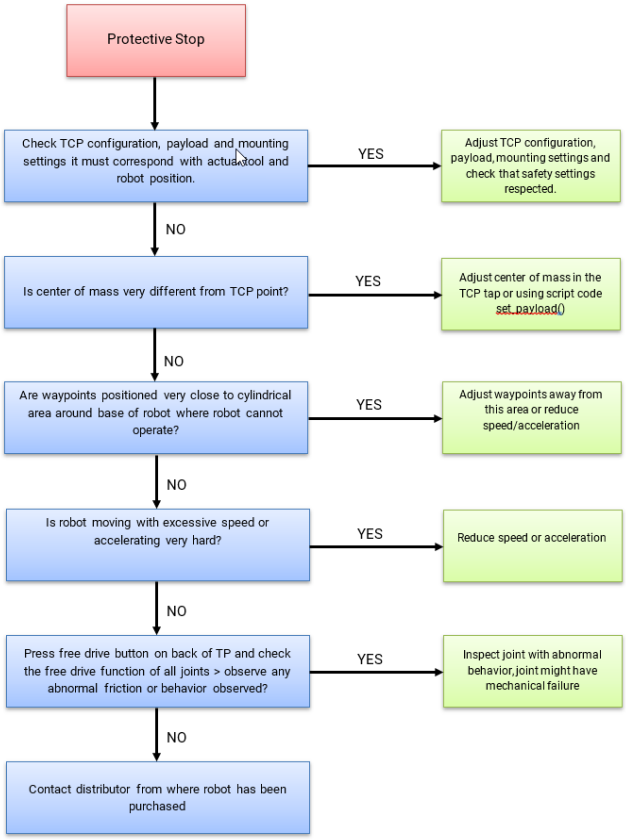
To completely reboot the robot system, follow the following steps:



6.6. Protective stop

Read also article 18939 on the support site www.universal-robots.com/support

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Ignoring protective stops is considered abuse of the robot which voids the warranty.

These faults can be hidden from view under the following two circumstances:

1. Personnel simply resetting a fault without review of why the fault has happened.



WARNING

Ignoring protective stops masks fault detection!
Pay careful attention to protective stops.
Learn why they happen to improve your programs and preserve fault detection!

Protective stops must never be acknowledged and reset automatically, it must always be a deliberate action by a user to resume after a protective stop.

In general, protective stops are designed to inform the user that the robot has stopped due to an external event such as hitting an obstacle or similar. In case the robots are pushed close to the limits, the robots can generate protective stops to indicate that they are not capable of following the desired trajectory. After a protective stop, the following must be done before resuming operation:

i. **If there has been a collision or similar:**
Remove the obstacle and ensure that operators are out of the way before resuming operation.
See Section 2 of Service Manual (see link below).

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ii. **If there has been NO collision or similar:**
The robot is operating too close to the limits, the application should be adjusted to reduce the load on the robot, for instance by reducing accelerations, by correct use of blends or similar measures.

Protective stops are indications of issues, including program or production issues - not only safety issues. An application which results in daily protective stops is not designed correctly and needs to be modified.

2. If an automatic acknowledgment and reset of a protective stop has been programmed - no one will see the protective stop.



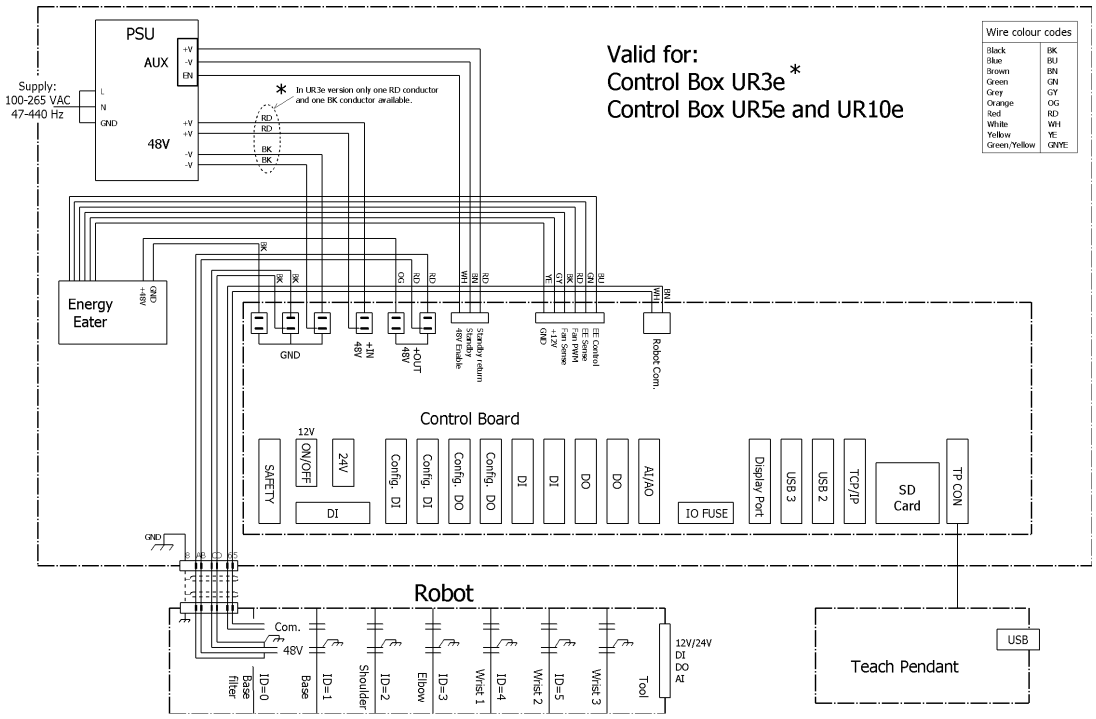
WARNING
Automatic acknowledgment and reset of protective stops masks faults that will lead to a failure condition.

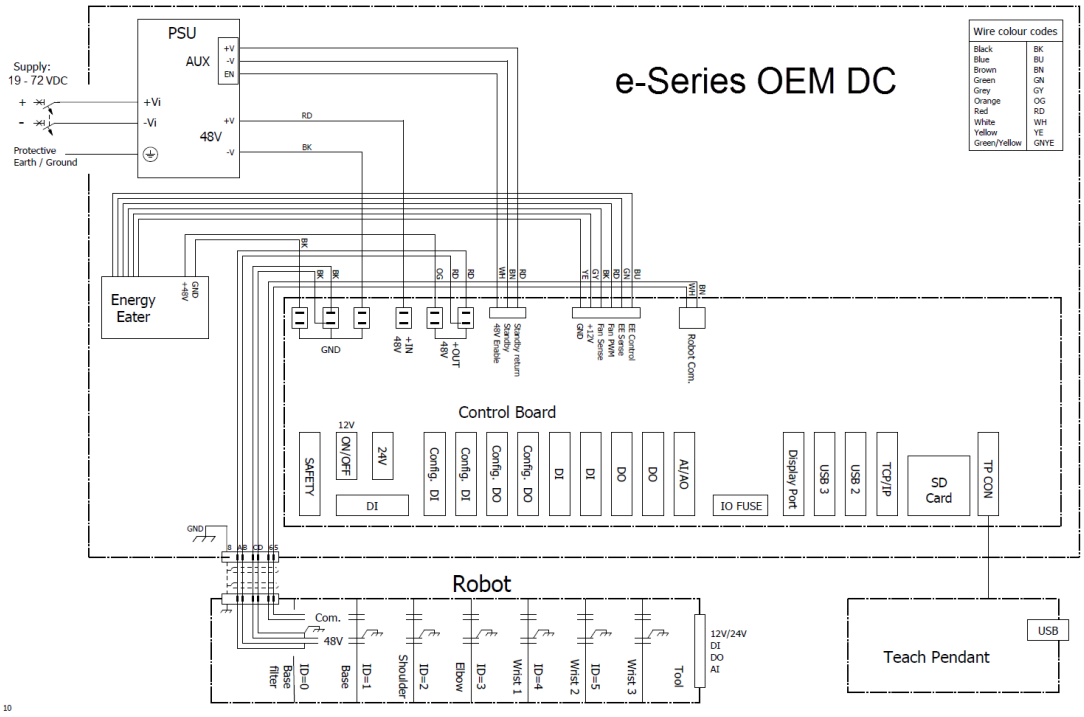
When there is a protective stop, verify the cause.
If there has been no collision, then adjust the program

If an integrator has set-up the application program to do automatic acknowledgement and reset of protective stops, the customer should contact the integrator change the program immediately, as such override voids the product warranty and masks fault detection.

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7. Electrical drawings





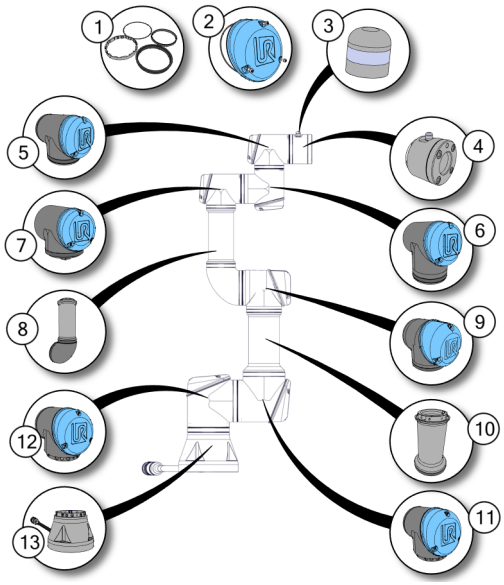
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8. Spare Parts

NOTICE

Ensure you have the correct part numbers when ordering spare parts.

8.1. Robot Arm



Click on the page no. in the right column to see part in detail or go to the page.

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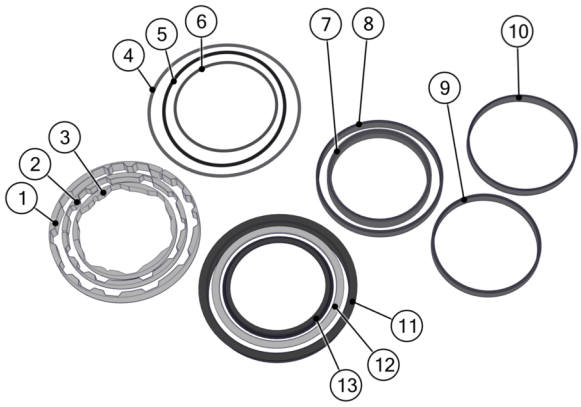
NO.	DESCRIPTION	PART NUMBER(S)	PAGE NO.
1	Sealing ring set	103703/103705/103700	8.1.1. Sealing set for UR3e - 103703 on the facing page-8.1.3. Sealing ring set UR10e/UR16e -103700 on page 178
2	Lid set	103413/103405/103410	8.1.4. Lid set for UR3e - 103413 on page 179-8.1.6. Lid set for UR10e/UR16e - 103410 on page 181
3	Protective cap for tool connector	131095	8.1.7. Protective cap for tool connector - 131095 on page 181
4	Tool mount with Force/Torque sensor	124083/124085/124080	8.1.8. Tool with Force/Torque sensor for UR3e - 124083 on page 182-8.1.10. Tool mount with Force/Torque sensor for UR10e/UR16e - 124080 on page 184
5	Wrist joint 3	124002/102414/102412	8.1.11. Joint Wrist 3 Size 0 for UR3e - 124002 on page 185-8.1.13. Joint Wrist 3 Size 2 for UR10e/UR16e - 102412 on page 187
6	Wrist joint 2	124110/124111/124112	8.1.14. Joint Wrist 2 Size 0 for UR3e - 124110 on page 188-8.1.16. Joint Wrist 2 Size 2 for UR10e/UR16e -124112 on page 190
7	Wrist joint 1	124001/102413/102411	8.1.17. Joint Wrist 1 Size 0 for UR3e - 124001 on page 191-8.1.19. Joint Wrist 1 Size 2 for UR10e/UR16e -102411 on page 193
8	Lower arm assembly	N/A	8.1.20. Lower arm assembly - N/A on page 194
9	Elbow joint	124011/124031/124031	8.1.21. Elbow joint Size 1 for UR3e- 124011 on page 195-8.1.23. Elbow joint Size 3 for UR10e/UR16e -124031 on page 197
10	Upper arm	N/A	8.1.24. Upper arm - N/A on page 198
11	Shoulder joint	124021/124031/124041	8.1.25. Shoulder joint Size 2 for UR3e - 124021 on page 199-8.1.27. Shoulder joint Size 4 for UR10e/UR16e -124041 on page 201
12	Base joint	124021/124031/124041	8.1.28. Base joint Size 2 for UR3e - 124021 on page 202-8.1.30. Base joint Size 4 for UR10e/UR16e -124041 on page 204
13	Base with Robot Arm cable	122083/122085/122080	-

Refer to Section Robot Arm for joint name and size.

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8.1.1. Sealing set for UR3e - 103703

Return to overview

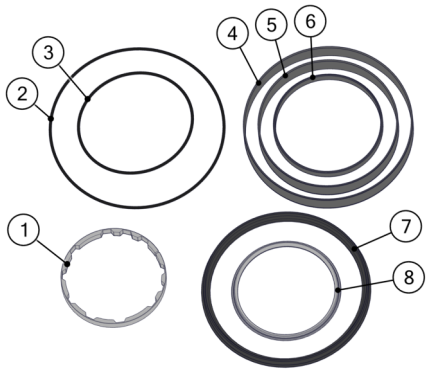


Sealing ring set UR3e - 103703				
NO.	QTY.	DESCRIPTION	PART NUMBER(S)	PAGE NO.
1	3	Form-ring for Size 2 joints	103703	N/A
2	2	Form-ring for Size 1 joints	103703	N/A
3	4	Form-ring for size 0 joints	103703	N/A
4	2	O-ring for size 2 lids	103703	N/A
5	1	O-ring for size 1 lids	103703	N/A
6	3	O-ring for size 0 lids	103703	N/A
7	2	Flat ring for lower arm	103703	N/A
8	1	Flat ring for size 1 joints	103703	N/A
9	4	Flat ring for size 0 joints	103703	N/A
10	3	Flat ring for size 2 joints	103703	N/A
11	2	Wear ring for size 2 joints	103703	N/A
12	1	Wear ring for size 1 joints	103703	N/A
13	3	Wear ring for size 0 joints	103703	N/A

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8.1.2. Sealing set for UR5e - 103705

Return to overview

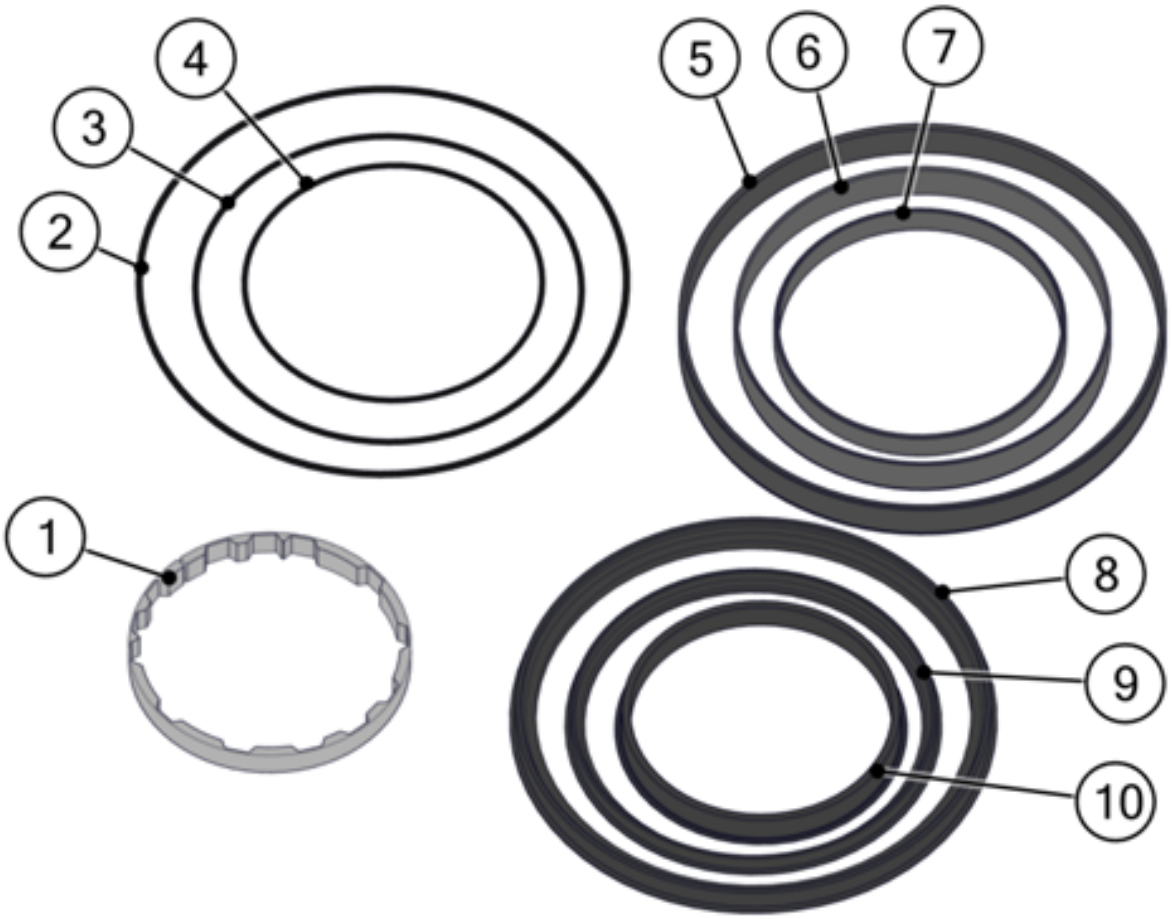


Sealing ring set UR5e - 103705				
NO.	QTY.	DESCRIPTION	PART NUMBER(S)	PAGE NO.
1	4	Form-ring for Size 1 joints	103705	N/A
2	3	O-ring for size 3 lids	103705	N/A
3	3	O-ring for size 1 lids	103705	N/A
4	5	Flat ring for size 3 joints	103705	N/A
5	1	Flat ring for lower arm	103705	N/A
6	4	Flat ring for size 1 joints	103705	N/A
7	2	Wear ring for size 3 joints	103705	N/A
8	3	Wear ring for size 1 joints	103705	N/A

8.1.3. Sealing ring set UR10e/UR16e -103700

Return to overview

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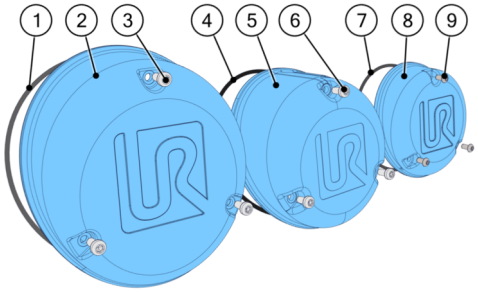


Sealing ring set UR10e/UR16e -103700				
NO.	QTY.	DESCRIPTION	PART NUMBER(S)	PAGE NO.
1	4	Form-ring for Size 2 joints	N/A	N/A
2	2	O-ring for size 4 lids	N/A	N/A
3	1	O-ring for size 3 lids	N/A	N/A
4	3	O-ring for size 2 lids	N/A	N/A
5	3	Flat ring for size 4 joints	N/A	N/A
6	3	Flat ring for size 3 joints	N/A	N/A
7	4	Flat ring for size 2 joints	N/A	N/A
8	2	Wear ring for size 4 joints	N/A	N/A
9	1	Wear ring for size 3 joints	N/A	N/A
10	3	Wear ring for size 2 joints	N/A	N/A

8.1.4. Lid set for UR3e - 103413

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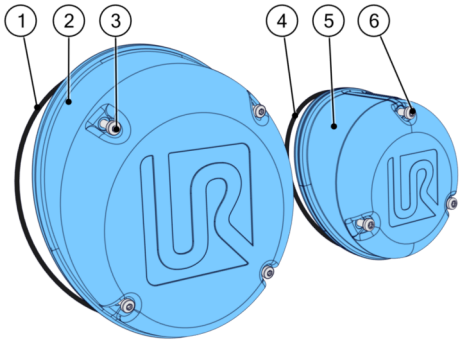


*All parts in the table below are included in the lid set

Lid set for UR3e - 103413				
NO.	QTY.	DESCRIPTION	PART NUMBER(S)	PAGE NO.
1	2	O-ring for size 2	N/A	N/A
2	2	Lid for size 2	N/A	N/A
3	6	Screws for size 2 lid	N/A	N/A
4	1	O-ring for size 1	N/A	N/A
5	1	Lid for size 1	N/A	N/A
6	3	Screws for size 1	N/A	N/A
7	3	O-ring for size 0	N/A	N/A
8	3	Lid for size 0	N/A	N/A
9	9	Screws for size 0	N/A	N/A

8.1.5. Lid set for UR5e - 103405

Return to overview



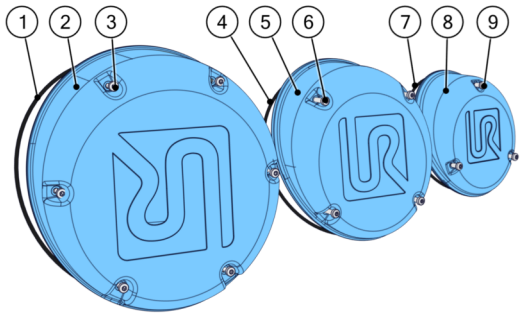
*All parts in the table below are included in the lid set

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Lid set for UR5e - 103405				
NO.	QTY.	DESCRIPTION	PART NUMBER(S)	PAGE NO.
1	3	O-ring for size 3	N/A	N/A
2	3	Lid for size 3	N/A	N/A
3	12	Screws for size 3 lid	N/A	N/A
4	3	O-ring for size 1	N/A	N/A
5	3	Lid for size 1	N/A	N/A
6	9	Screws for size 1	N/A	N/A

8.1.6. Lid set for UR10e/UR16e - 103410

Return to overview



*All parts in the table below are included in the lid set

Lid set for UR10e/UR16e - 103410				
NO.	QTY.	DESCRIPTION	PART NUMBER(S)	PAGE NO.
1	2	O-ring for size 4	N/A	N/A
2	2	Lid for size 4	N/A	N/A
3	12	Screws for size 4 lid	N/A	N/A
4	1	O-ring for size 3	N/A	N/A
5	1	Lid for size 3	N/A	N/A
6	4	Screws for size 3	N/A	N/A
7	3	O-ring for size 2	N/A	N/A
8	3	Lid for size 2	N/A	N/A
9	9	Screws for size 2	N/A	N/A

8.1.7. Protective cap for tool connector - 131095

Return to overview

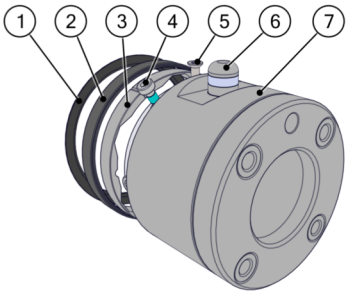
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Protective cap for tool connector - 131095				
NO.	QTY.	DESCRIPTION	PART NUMBER(S)	PAGE NO.
1	1	Protective cap for tool connector	131095	1

8.1.8. Tool with Force/Torque sensor for UR3e - 124083

Return to overview

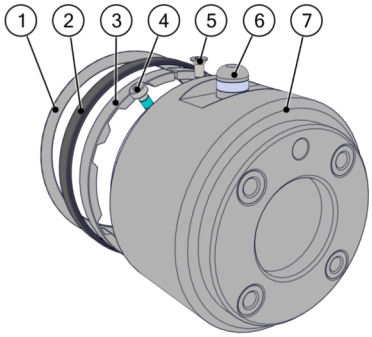


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Tool mount with Force/Torque sensor for UR3e - 124083				
NO.	QTY.	DESCRIPTION	PART NUMBER (S)	PAGE NO.
1	1	Wear ring	103703	8.1.1. Sealing set for UR3e - 103703 on page 177
2	1	Flat ring	103703	8.1.1. Sealing set for UR3e - 103703 on page 177
3	1	Form ring	103703	8.1.1. Sealing set for UR3e - 103703 on page 177
4	6	Screw	N/A	N/A
5	3	Screw counter sunk	N/A	N/A
6	1	Tool connector lid	131095	8.1.7. Protective cap for tool connector - 131095 on page 181
7	1	Tool mount with Force/Torque sensor	124083	1

8.1.9. Tool with Force/Torque sensor for UR5e -124085

Return to overview

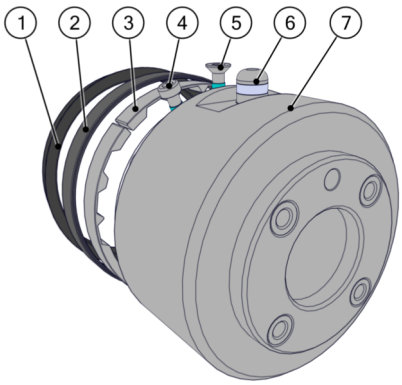


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Tool mount with Force/Torque sensor for UR5e -124085				
NO.	QTY.	DESCRIPTION	PART NUMBER (S)	PAGE NO.
1	1	Wear ring	103705	8.1.2. Sealing set for UR5e - 103705 on page 178
2	1	Flat ring	103705	8.1.2. Sealing set for UR5e - 103705 on page 178
3	1	Form ring	103705	8.1.2. Sealing set for UR5e - 103705 on page 178
4	8	Screw	N/A	N/A
5	3	Screw counter sunk	N/A	N/A
6	1	Tool connector lid	131095	8.1.7. Protective cap for tool connector - 131095 on page 181
7	1	Tool mount with Force/Torque sensor	124085	1

8.1.10. Tool mount with Force/Torque sensor for UR10e/UR16e - 124080

Return to overview

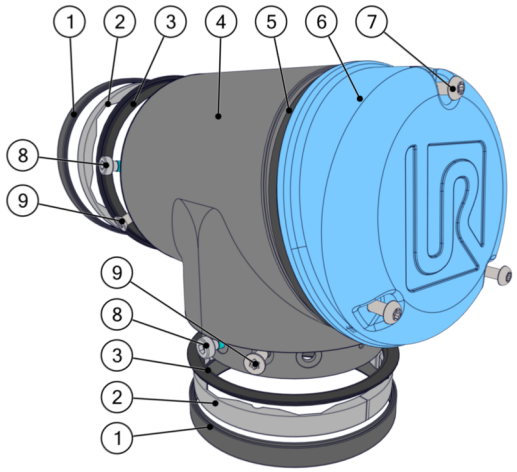


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Tool mount with Force/Torque sensor for UR10e/UR16e - 124080				
NO.	QTY.	DESCRIPTION	PART NUMBER (S)	PAGE NO.
1	1	Wear ring	N/A	8.1.3. Sealing ring set UR10e/UR16e - 103700 on page 178
2	1	Flat ring	N/A	8.1.3. Sealing ring set UR10e/UR16e - 103700 on page 178
3	1	Form ring	N/A	8.1.3. Sealing ring set UR10e/UR16e - 103700 on page 178
4	10	Screw	N/A	N/A
5	3	Screw counter sunk	N/A	N/A
6	1	Tool connector lid	131095	8.1.7. Protective cap for tool connector - 131095 on page 181
7	1	Tool mount with Force/Torque sensor	124080	1

8.1.11. Joint Wrist 3 Size 0 for UR3e - 124002

Return to overview

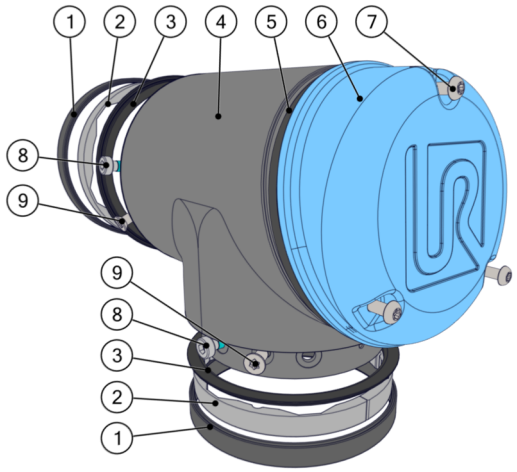


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Wrist joint 3 for UR3e - 124002				
NO.	QTY.	DESCRIPTION	PART NUMBER (S)	PAGE NO.
1	2	Flat ring for size 0	103703	8.1.1. Sealing set for UR3e - 103703 on page 177
2	2	Form ring for size 0	103703	8.1.1. Sealing set for UR3e - 103703 on page 177
3	2	Wear ring for size 0	103703	8.1.1. Sealing set for UR3e - 103703 on page 177
4	1	Wrist 3, size 0	N/A	N/A
5	1	O-ring for lid size 0	103413	8.1.4. Lid set for UR3e - 103413 on page 179
6	1	Lid size 0	103413	8.1.4. Lid set for UR3e - 103413 on page 179
7	3	Screws for lid size 0	103413	8.1.4. Lid set for UR3e - 103413 on page 179
8	12	Screws	N/A	N/A
9	6	Screws counter sunk	N/A	N/A

8.1.12. Joint Wrist 3 Size 1 for UR5e - 102414

Return to overview

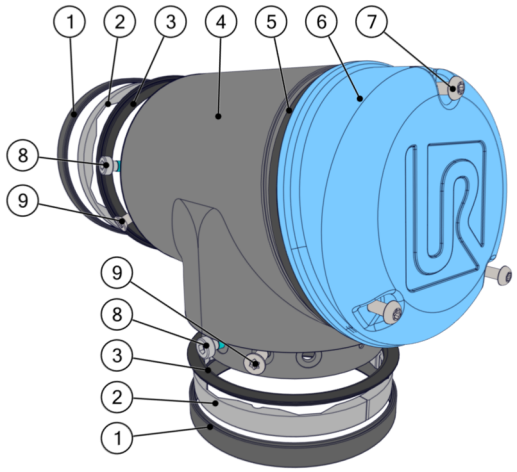


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Wrist joint 3 for UR5e - 102414				
NO.	QTY.	DESCRIPTION	PART NUMBER (S)	PAGE NO.
1	2	Flat ring for size 1	103705	8.1.2. Sealing set for UR5e - 103705 on page 178
2	2	Form ring for size 1	103705	8.1.2. Sealing set for UR5e - 103705 on page 178
3	2	Wear ring for size 1	103705	8.1.2. Sealing set for UR5e - 103705 on page 178
4	1	Wrist 3, size 1	N/A	N/A
5	1	O-ring for lid size 1	103405	8.1.5. Lid set for UR5e - 103405 on page 180
6	1	Lid size 1	103405	8.1.5. Lid set for UR5e - 103405 on page 180
7	3	Screws for lid size 1	103405	8.1.5. Lid set for UR5e - 103405 on page 180
8	16	Screws	N/A	N/A
9	6	Screws counter sunk	N/A	N/A

8.1.13. Joint Wrist 3 Size 2 for UR10e/UR16e - 102412

Return to overview

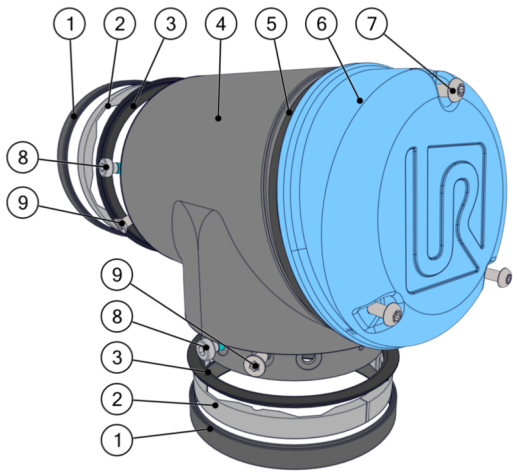


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Wrist joint 3 for UR10e/UR16e - 102412				
NO.	QTY.	DESCRIPTION	PART NUMBER(S)	PAGE NO.
1	2	Flat ring for size 2	103700	8.1.3. Sealing ring set UR10e/UR16e - 103700 on page 178
2	2	Form ring for size 2	103700	8.1.3. Sealing ring set UR10e/UR16e - 103700 on page 178
3	2	Wear ring for size 2	103700	8.1.3. Sealing ring set UR10e/UR16e - 103700 on page 178
4	1	Wrist 3, size 2	N/A	N/A
5	1	O-ring for lid size 2	103410	8.1.6. Lid set for UR10e/UR16e - 103410 on page 181
6	1	Lid size 2	103410	8.1.6. Lid set for UR10e/UR16e - 103410 on page 181
7	3	Screws for lid size 2	103410	8.1.6. Lid set for UR10e/UR16e - 103410 on page 181
8	20	Screws	N/A	N/A
9	6	Screws counter sunk	N/A	N/A

8.1.14. Joint Wrist 2 Size 0 for UR3e - 124110

Return to overview

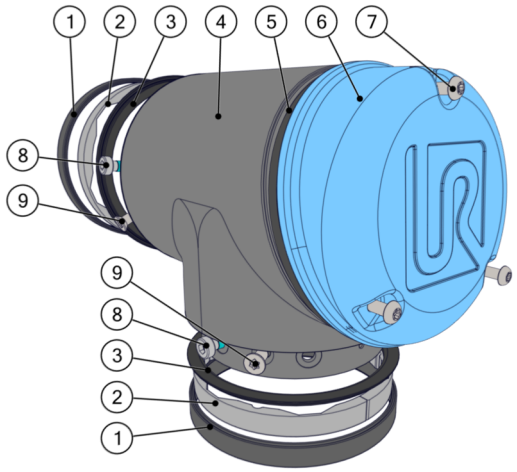


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Wrist joint 2 for UR3e - 124110				
NO.	QTY.	DESCRIPTION	PART NUMBER (S)	PAGE NO.
1	2	Flat ring for size 0	103703	8.1.1. Sealing set for UR3e - 103703 on page 177
2	2	Form ring for size 0	103703	8.1.1. Sealing set for UR3e - 103703 on page 177
3	2	Wear ring for size 0	103703	8.1.1. Sealing set for UR3e - 103703 on page 177
4	1	Wrist 2, size 0	N/A	N/A
5	1	O-ring for lid size 0	103413	8.1.4. Lid set for UR3e - 103413 on page 179
6	1	Lid size 0	103413	8.1.4. Lid set for UR3e - 103413 on page 179
7	3	Screws for lid size 0	103413	8.1.4. Lid set for UR3e - 103413 on page 179
8	12	Screws	N/A	N/A
9	6	Screws counter sunk	N/A	N/A

8.1.15. Joint Wrist 2 Size 1 for UR5e -124111

Return to overview

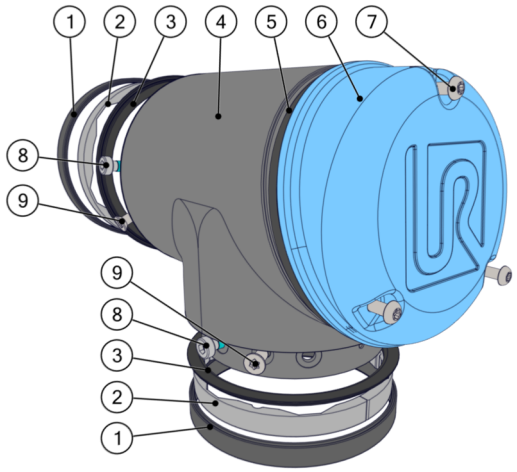


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Wrist joint 2 for UR5e -124111				
NO.	QTY.	DESCRIPTION	PART NUMBER (S)	PAGE NO.
1	2	Flat ring for size 1	103705	8.1.2. Sealing set for UR5e - 103705 on page 178
2	2	Form ring for size 1	103705	8.1.2. Sealing set for UR5e - 103705 on page 178
3	2	Wear ring for size 1	103705	8.1.2. Sealing set for UR5e - 103705 on page 178
4	1	Wrist 2, size 1	N/A	N/A
5	1	O-ring for lid size 1	103405	8.1.5. Lid set for UR5e - 103405 on page 180
6	1	Lid size 1	103405	8.1.5. Lid set for UR5e - 103405 on page 180
7	3	Screws for lid size 1	103405	8.1.5. Lid set for UR5e - 103405 on page 180
8	16	Screws	N/A	N/A
9	6	Screws counter sunk	N/A	N/A

8.1.16. Joint Wrist 2 Size 2 for UR10e/UR16e -124112

Return to overview

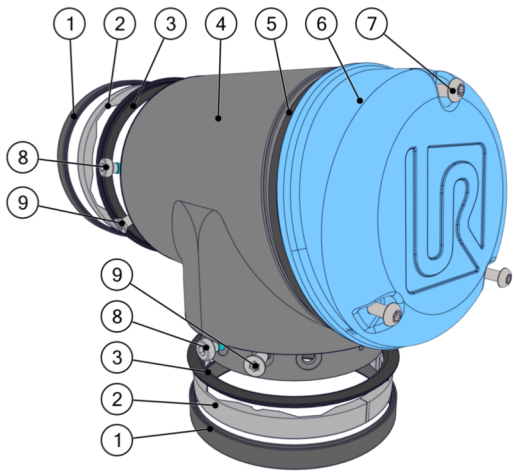


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Wrist joint 2 for UR10e/UR16e -124112				
NO.	QTY.	DESCRIPTION	PART NUMBER(S)	PAGE NO.
1	2	Flat ring for size 2	103700	8.1.3. Sealing ring set UR10e/UR16e - 103700 on page 178
2	2	Form ring for size 2	103700	8.1.3. Sealing ring set UR10e/UR16e - 103700 on page 178
3	2	Wear ring for size 2	103700	8.1.3. Sealing ring set UR10e/UR16e - 103700 on page 178
4	1	Wrist 2, size 2	N/A	N/A
5	1	O-ring for lid size 2	103410	8.1.6. Lid set for UR10e/UR16e - 103410 on page 181
6	1	Lid size 2	103410	8.1.6. Lid set for UR10e/UR16e - 103410 on page 181
7	3	Screws for lid size 2	103410	8.1.6. Lid set for UR10e/UR16e - 103410 on page 181
8	20	Screws	N/A	N/A
9	6	Screws counter sunk	N/A	N/A

8.1.17. Joint Wrist 1 Size 0 for UR3e - 124001

Return to overview

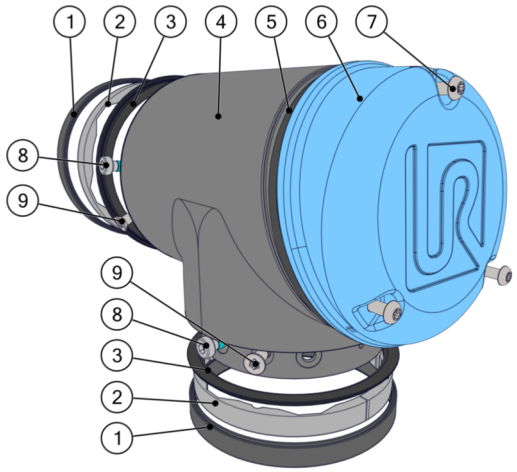


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Wrist joint 1 for UR3e - 124001				
NO.	QTY.	DESCRIPTION	PART NUMBER (S)	PAGE NO.
1	2	Flat ring for size 0	103703	8.1.1. Sealing set for UR3e - 103703 on page 177
2	2	Form ring for size 0	103703	8.1.1. Sealing set for UR3e - 103703 on page 177
3	2	Wear ring for size 0	103703	8.1.1. Sealing set for UR3e - 103703 on page 177
4	1	Wrist 1, size 0	N/A	N/A
5	1	O-ring for lid size 0	103413	8.1.4. Lid set for UR3e - 103413 on page 179
6	1	Lid size 0	103413	8.1.4. Lid set for UR3e - 103413 on page 179
7	3	Screws for lid size 0	103413	8.1.4. Lid set for UR3e - 103413 on page 179
8	12	Screws	N/A	N/A
9	6	Screws counter sunk	N/A	N/A

8.1.18. Joint Wrist 1 Size 1 for UR5e -102413

Return to overview

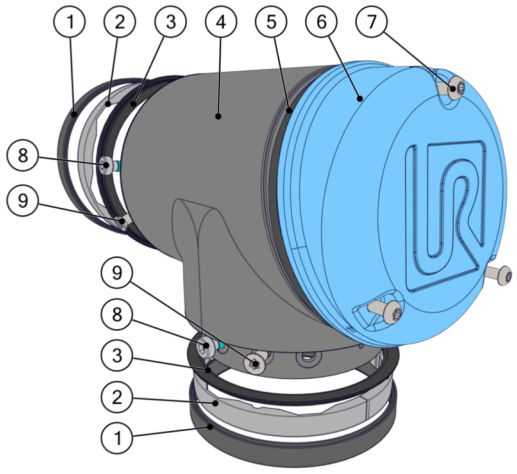


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Wrist joint 1 for UR5e -102413				
NO.	QTY.	DESCRIPTION	PART NUMBER (S)	PAGE NO.
1	2	Flat ring for size 1	103705	8.1.2. Sealing set for UR5e - 103705 on page 178
2	2	Form ring for size 1	103705	8.1.2. Sealing set for UR5e - 103705 on page 178
3	2	Wear ring for size 1	103705	8.1.2. Sealing set for UR5e - 103705 on page 178
4	1	Wrist 1, size 1	N/A	N/A
5	1	O-ring for lid size 1	103405	8.1.5. Lid set for UR5e - 103405 on page 180
6	1	Lid size 1	103405	8.1.5. Lid set for UR5e - 103405 on page 180
7	3	Screws for lid size 1	103405	8.1.5. Lid set for UR5e - 103405 on page 180
8	16	Screws	N/A	N/A
9	6	Screws counter sunk	N/A	N/A

8.1.19. Joint Wrist 1 Size 2 for UR10e/UR16e -102411

Return to overview

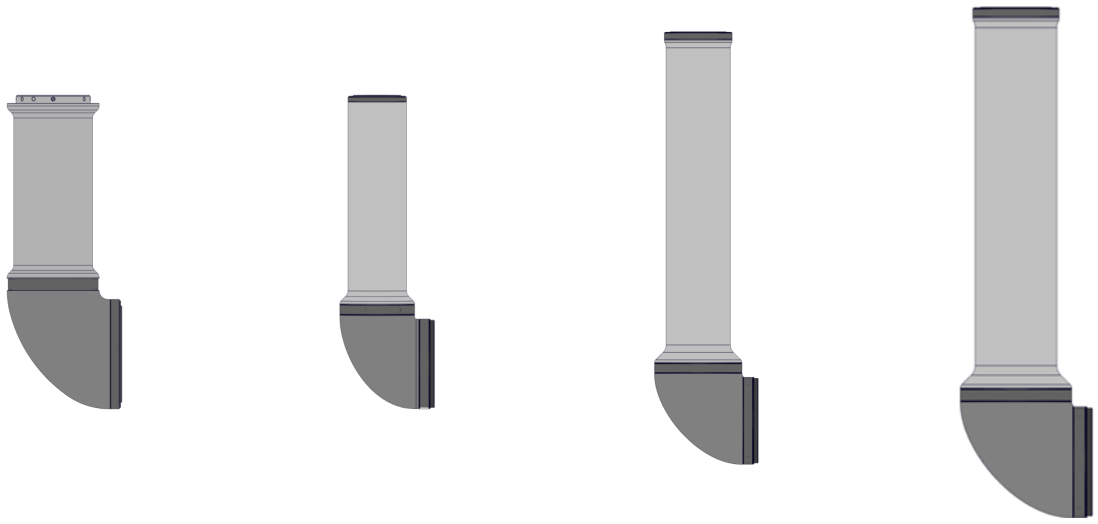


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Wrist joint 1 for UR10e/UR16e -102411				
NO.	QTY.	DESCRIPTION	PART NUMBER(S)	PAGE NO.
1	2	Flat ring for size 2	103700	8.1.3. Sealing ring set UR10e/UR16e - 103700 on page 178
2	2	Form ring for size 2	103700	8.1.3. Sealing ring set UR10e/UR16e - 103700 on page 178
3	2	Wear ring for size 2	103700	8.1.3. Sealing ring set UR10e/UR16e - 103700 on page 178
4	1	Wrist 1, size 2	N/A	N/A
5	1	O-ring for lid size 2	103410	8.1.6. Lid set for UR10e/UR16e - 103410 on page 181
6	1	Lid size 2	103410	8.1.6. Lid set for UR10e/UR16e - 103410 on page 181
7	3	Screws for lid size 2	103410	8.1.6. Lid set for UR10e/UR16e - 103410 on page 181
8	20	Screws	N/A	N/A
9	6	Screws counter sunk	N/A	N/A

8.1.20. Lower arm assembly - N/A

Return to overview



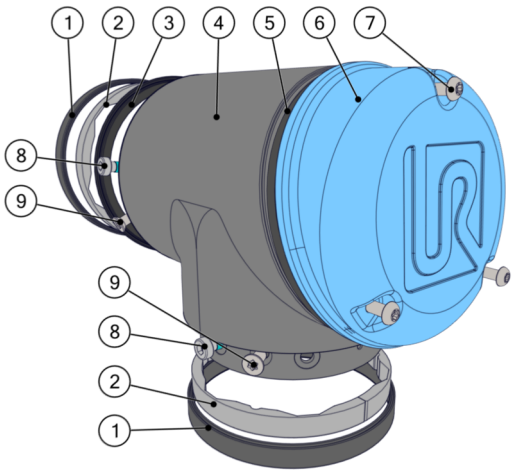
If for any reason this spare parts is needed , please contact your preferred distributor for part number, availability and ordering.

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Lower arm assembly - N/A				
NO.	QTY.	DESCRIPTION	PART NUMBER(S)	PAGE NO.
	1	Lower arm assembly UR3e	N/A	N/A
	1	Lower arm assembly UR5e	N/A	N/A
	1	Lower arm assembly UR10e	N/A	N/A
	1	Lower arm assembly UR16e	N/A	N/A

8.1.21. Elbow joint Size 1 for UR3e- 124011

Return to overview

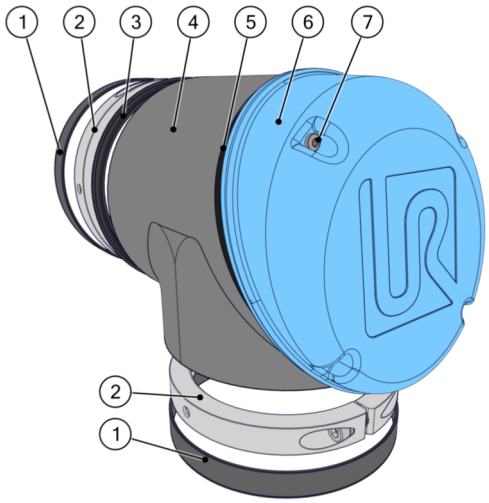


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Elbow joint for UR3e- 124011				
NO.	QTY.	DESCRIPTION	PART NUMBER (S)	PAGE NO.
1	2	Flat ring for size 1	103703	8.1.1. Sealing set for UR3e - 103703 on page 177
2	2	Form ring for size 1	103703	8.1.1. Sealing set for UR3e - 103703 on page 177
3	1	Wear ring for size 1	103703	8.1.1. Sealing set for UR3e - 103703 on page 177
4	1	Elbow, size 1	N/A	N/A
5	1	O-ring for lid size 1	103413	8.1.4. Lid set for UR3e - 103413 on page 179
6	1	Lid size 1	103413	8.1.4. Lid set for UR3e - 103413 on page 179
7	3	Screws for lid size 1	103413	8.1.4. Lid set for UR3e - 103413 on page 179
8	16	Screws	N/A	N/A
9	6	Screws counter sunk	N/A	N/A

8.1.22. Elbow joint Size 3 for UR5e -124031

Return to overview



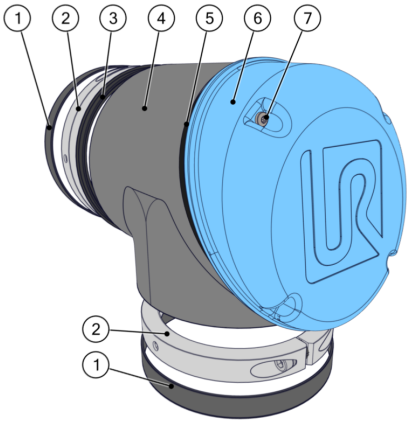
*The Joint Size 3 can be used for J0, J1 and J2 of your UR5e. Specify the desired joint position when ordering this spare part (J0 = base, J1 = shoulder, J2 = elbow).

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Elbow joint Size 3 for UR5e -124031				
NO.	QTY.	DESCRIPTION	PART NUMBER(S)	PAGE NO.
1	2	Flat ring for size 3	103705	8.1.2. Sealing set for UR5e - 103705 on page 178
2	2	Bracket connection incl. bolts and seals size 3	N/A	N/A
3	1	Wear ring size 3	103705	8.1.2. Sealing set for UR5e - 103705 on page 178
4	1	Elbow, size 3	N/A	N/A
5	1	O-ring for lid size 3	103405	8.1.5. Lid set for UR5e - 103405 on page 180
6	1	Lid size 3	103405	8.1.5. Lid set for UR5e - 103405 on page 180
7	4	Screws for lid size 3	103405	8.1.5. Lid set for UR5e - 103405 on page 180

8.1.23. Elbow joint Size 3 for UR10e/UR16e -124031

Return to overview



WARNING

Using size 3 joints manufactured before November 12, 2020, as a replacement for any UR10e size 3 elbow joint (either UR10e with 12,5kg max. payload or UR10e with 10kg max. payload) may damage the housing.

If you hold any spare part joint size 3 from previously to 12 November 2020, only use it for replacements of UR5e robots' joints.

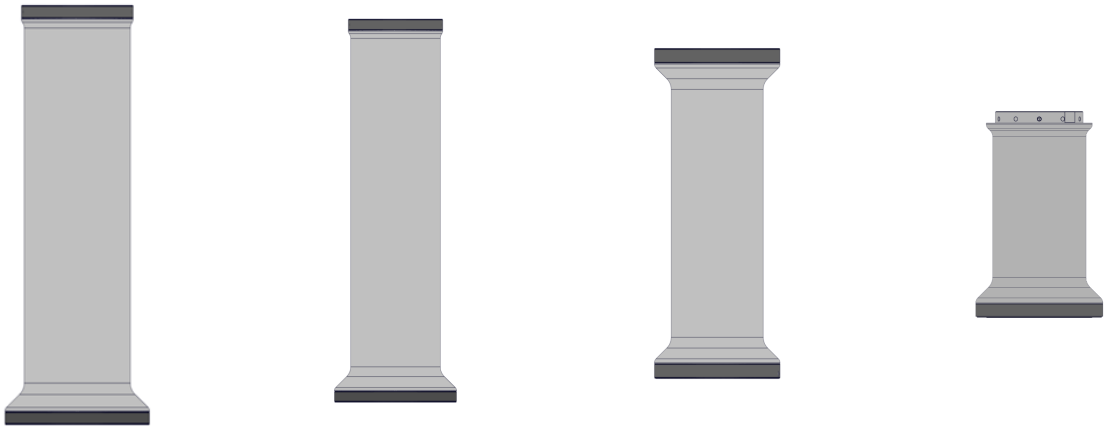
Under no circumstances use joints from robots previously to 12 November 2020 as replacements to UR10e size 3 elbow joint. Size 3 joints from previously to: Serial Number: 20205001663. Date: 12 November 2020. Must only be used as spare parts for UR5e robots.

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Elbow joint for UR10e/UR16e -124031				
NO.	QTY.	DESCRIPTION	PART NUMBER (S)	PAGE NO.
1	2	Flat ring for size 3	103700	8.1.3. Sealing ring set UR10e/UR16e - 103700 on page 178
2	2	Bracket connection incl. bolts and seals size 1	N/A	N/A
3	1	Wear ring size 3	103700	8.1.3. Sealing ring set UR10e/UR16e - 103700 on page 178
4	1	Elbow, size 3	N/A	N/A
5	1	O-ring for lid size 3	103410	8.1.6. Lid set for UR10e/UR16e - 103410 on page 181
6	1	Lid size 3	103410	8.1.6. Lid set for UR10e/UR16e - 103410 on page 181
7	3	Screws for lid size 3	103410	8.1.6. Lid set for UR10e/UR16e - 103410 on page 181

8.1.24. Upper arm - N/A

Return to overview



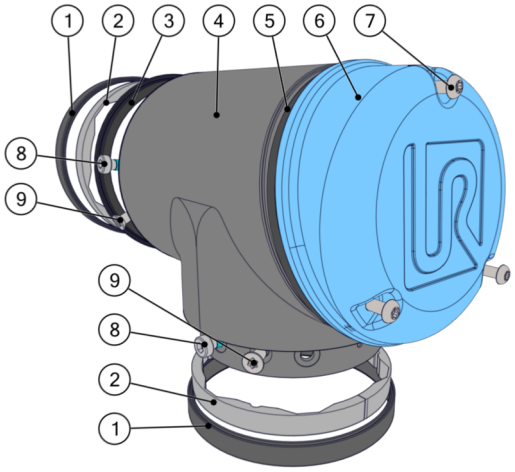
If for any reason this spare part is needed, please contact your preferred distributor for part number, and availability and ordering.

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Upper arm assembly - N/A				
NO.	QTY.	DESCRIPTION	PART NUMBER(S)	PAGE NO.
	1	Upper arm assembly UR3e	N/A	N/A
	1	Upper arm assembly UR5e	N/A	N/A
	1	Upper arm assembly UR10e	N/A	N/A
	1	Upper arm assembly UR16e	N/A	N/A

8.1.25. Shoulder joint Size 2 for UR3e - 124021

Return to overview



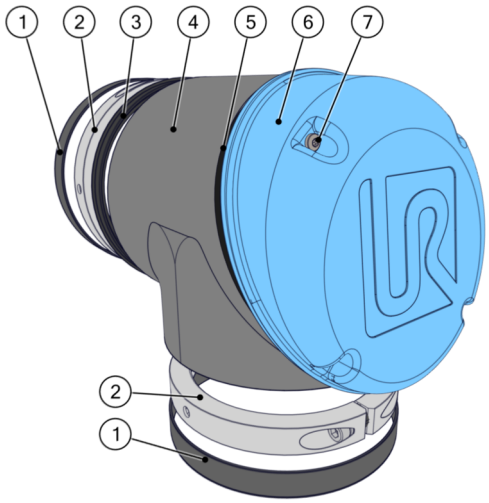
*The Joint Size 2 can be used for J0 and J1 of your UR3e. Specify the desired joint position when ordering this spare part (J0 = base, J1 = shoulder).

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Shoulder joint for UR3e - 124021				
NO.	QTY.	DESCRIPTION	PART NUMBER (S)	PAGE NO.
1	2	Flat ring for size 2	103703	8.1.1. Sealing set for UR3e - 103703 on page 177
2	2	Form ring for size 2	103703	8.1.1. Sealing set for UR3e - 103703 on page 177
3	1	Wear ring for size 2	103703	8.1.1. Sealing set for UR3e - 103703 on page 177
4	1	Shoulder, size 2	N/A	N/A
5	1	O-ring for lid size 2	103413	8.1.4. Lid set for UR3e - 103413 on page 179
6	1	Lid size 2	103413	8.1.4. Lid set for UR3e - 103413 on page 179
7	3	Screws for lid size 2	103413	8.1.4. Lid set for UR3e - 103413 on page 179
8	20	Screws	N/A	N/A
9	6	Screws counter sunk	N/A	N/A

8.1.26. Shoulder joint Size 3 for UR5e -124031

Return to overview



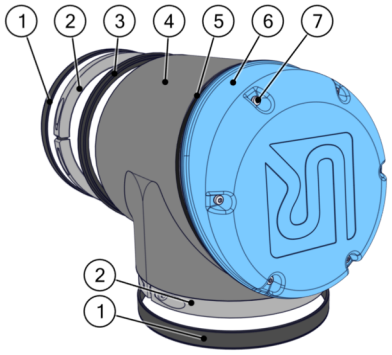
*The Joint Size 3 can be used for J0, J1 and J2 of your UR5e. Specify the desired joint position when ordering this spare part (J0 = base, J1 = shoulder, J2 = elbow).

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Shoulder joint Size 3 for UR5e -124031				
NO.	QTY.	DESCRIPTION	PART NUMBER(S)	PAGE NO.
1	2	Flat ring for size 3	103705	8.1.2. Sealing set for UR5e - 103705 on page 178
2	2	Bracket connection incl. bolts and seals size 3	N/A	N/A
3	1	Wear ring size 3	103705	8.1.2. Sealing set for UR5e - 103705 on page 178
4	1	Shoulder, size 3	N/A	N/A
5	1	O-ring for lid size 3	103405	8.1.5. Lid set for UR5e - 103405 on page 180
6	1	Lid size 3	103405	8.1.5. Lid set for UR5e - 103405 on page 180
7	4	Screws for lid size 3	103405	8.1.5. Lid set for UR5e - 103405 on page 180

8.1.27. Shoulder joint Size 4 for UR10e/UR16e -124041

Return to overview



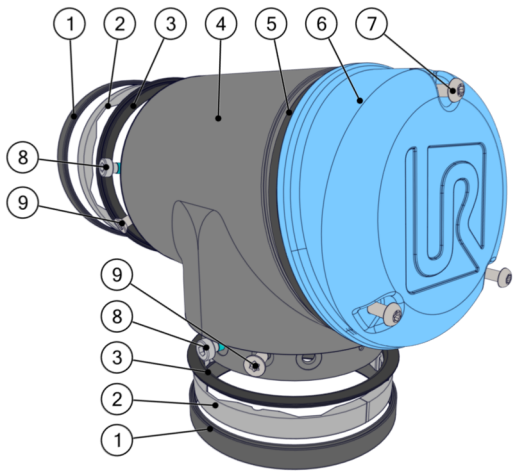
*The Joint Size 4 can be used for J0 and J1 of your UR10e/UR16e. Specify the desired joint position when ordering this spare part (J0 = base, J1 = shoulder).

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Shoulder joint for UR10e/UR16e -124041				
NO.	QTY.	DESCRIPTION	PART NUMBER (S)	PAGE NO.
1	2	Flat ring for size 4	103700	8.1.3. Sealing ring set UR10e/UR16e - 103700 on page 178
2	2	Bracket connection incl. bolts and seals size 4	N/A	N/A
3	1	Wear ring size 4	103700	8.1.3. Sealing ring set UR10e/UR16e - 103700 on page 178
4	1	Shoulder, size 4	N/A	N/A
5	1	O-ring for lid size 4	103410	8.1.6. Lid set for UR10e/UR16e - 103410 on page 181
6	1	Lid size 4	103410	8.1.6. Lid set for UR10e/UR16e - 103410 on page 181
7	6	Screws for lid size 4	103410	8.1.6. Lid set for UR10e/UR16e - 103410 on page 181

8.1.28. Base joint Size 2 for UR3e - 124021

Return to overview



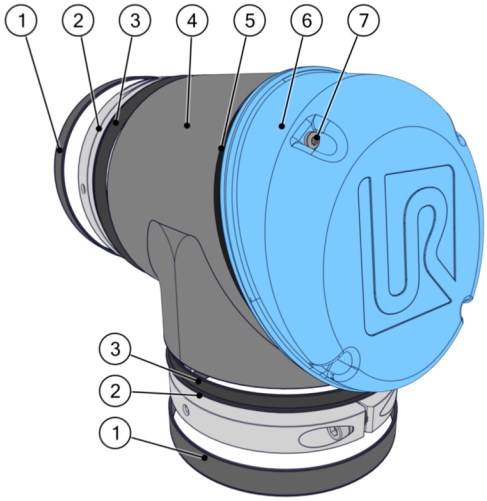
*The Joint Size 2 can be used for J0 and J1 of your UR3e. Specify the desired joint position when ordering this spare part (J0 = base, J1 = shoulder).

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Base joint for UR3e - 124021				
NO.	QTY.	DESCRIPTION	PART NUMBER (S)	PAGE NO.
1	2	Flat ring for size 2	103703	8.1.1. Sealing set for UR3e - 103703 on page 177
2	2	Form ring for size 2	103703	8.1.1. Sealing set for UR3e - 103703 on page 177
3	2	Wear ring for size 2	103703	8.1.1. Sealing set for UR3e - 103703 on page 177
4	1	Base joint, size 2	N/A	N/A
5	1	O-ring for lid size 2	103413	8.1.4. Lid set for UR3e - 103413 on page 179
6	1	Lid size 2	103413	8.1.4. Lid set for UR3e - 103413 on page 179
7	3	Screws for lid size 2	103413	8.1.4. Lid set for UR3e - 103413 on page 179
8	20	Screws	N/A	N/A
9	6	Screws counter sunk	N/A	N/A

8.1.29. Base joint Size 3 for UR5e - 124031

Return to overview



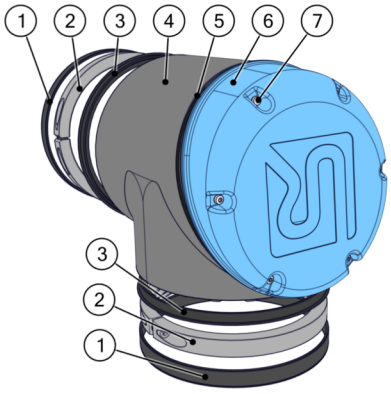
*The Joint Size 3 can be used for J0, J1 and J2 of your UR5e. Specify the desired joint position when ordering this spare part (J0 = base, J1 = shoulder, J2 = elbow).

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Base joint Size 3 for UR5e - 124031				
NO.	QTY.	DESCRIPTION	PART NUMBER(S)	PAGE NO.
1	2	Flat ring for size 3	103705	8.1.2. Sealing set for UR5e - 103705 on page 178
2	2	Bracket connection incl. bolts and seals size 3	N/A	N/A
3	2	Wear ring size 3	103705	8.1.2. Sealing set for UR5e - 103705 on page 178
4	1	Base joint, size 3	N/A	N/A
5	1	O-ring for lid size 3	103405	8.1.5. Lid set for UR5e - 103405 on page 180
6	1	Lid size 3	103405	8.1.5. Lid set for UR5e - 103405 on page 180
7	3	Screws for lid size 3	103405	8.1.5. Lid set for UR5e - 103405 on page 180

8.1.30. Base joint Size 4 for UR10e/UR16e -124041

Return to overview



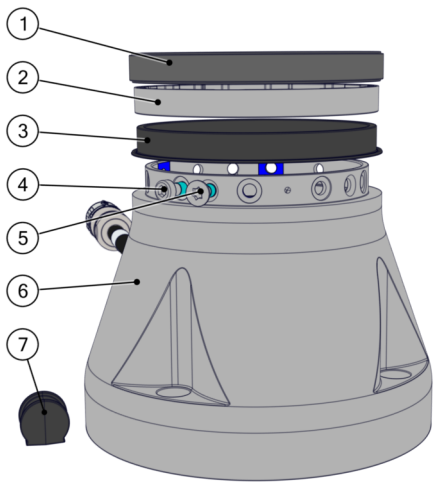
*The Joint Size 4 can be used for J0 and J1 of your UR10e/UR16e. Specify the desired joint position when ordering this spare part (J0 = base, J1 = shoulder).

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Base joint for UR10e/UR16e -124041				
NO.	QTY.	DESCRIPTION	PART NUMBER (S)	PAGE NO.
1	2	Flat ring for size 4	103700	8.1.3. Sealing ring set UR10e/UR16e - 103700 on page 178
2	2	Bracket connection incl. bolts and seals size 4	N/A	N/A
3	2	Wear ring size 4	103700	8.1.3. Sealing ring set UR10e/UR16e - 103700 on page 178
4	1	Base joint, size 4	N/A	N/A
5	1	O-ring for lid size 4	103410	8.1.6. Lid set for UR10e/UR16e - 103410 on page 181
6	1	Lid size 4	103410	8.1.6. Lid set for UR10e/UR16e - 103410 on page 181
7	6	Screws for lid size 4	103410	8.1.6. Lid set for UR10e/UR16e - 103410 on page 181

8.1.31. Base with Flange Connector cable for UR3e -123183

Return to overview



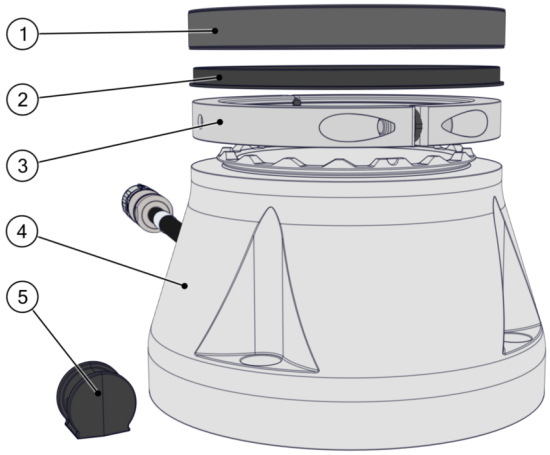
*The cable is not included in this Spare Part, if you need the cable, please refer to the cable option spare part section.

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Base with Flange Connector cable for UR5e -123185				
NO.	QTY.	DESCRIPTION	PART NUMBER (S)	PAGE NO.
1	1	Flat ring for size 4	103700	8.1.3. Sealing ring set UR10e/UR16e - 103700 on page 178
2	1	Wear ring for size 4	103700	8.1.3. Sealing ring set UR10e/UR16e - 103700 on page 178
3	1	Bracket connection incl. bolts and seals size 4	N/A	N/A
4	1	Base excl. cable, size 4	N/A	N/A
5	1	Plug for Base	N/A	N/A

8.1.32. Base with Flange Connector cable for UR5e -123185

Return to overview



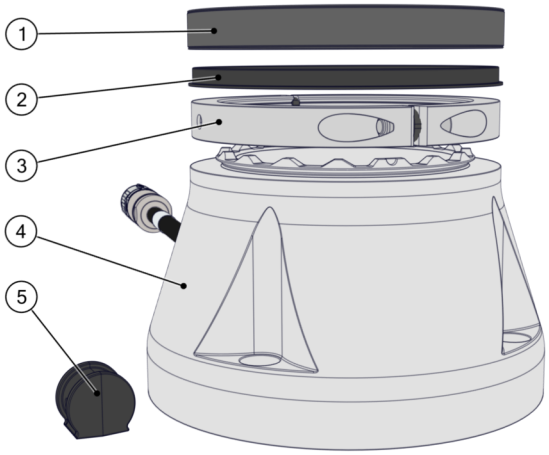
*The cable is not included in this Spare Part, if you need the cable, please refer to the cable option spare part section.

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Base with Flange Connector cable for UR5e -123185				
NO.	QTY.	DESCRIPTION	PART NUMBER (S)	PAGE NO.
1	1	Flat ring for size 4	103700	8.1.3. Sealing ring set UR10e/UR16e -103700 on page 178
2	1	Wear ring for size 4	103700	8.1.3. Sealing ring set UR10e/UR16e -103700 on page 178
3	1	Bracket connection incl. bolts and seals size 4	N/A	N/A
4	1	Base excl. cable, size 4	N/A	N/A
5	1	Plug for Base	N/A	N/A

8.1.33. Base with Flange Connector cable for UR10e/UR16e - 123180

Return to overview



*The cable is not included in this Spare Part, if you need the cable, please refer to the cable option spare part section.

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Base with Flange Connector cable for UR10e/UR16e - 123180				
NO.	QTY.	DESCRIPTION	PART NUMBER (S)	PAGE NO.
1	1	Flat ring for size 4	103700	8.1.3. Sealing ring set UR10e/UR16e -103700 on page 178
2	1	Wear ring for size 4	103700	8.1.3. Sealing ring set UR10e/UR16e -103700 on page 178
3	1	Bracket connection incl. bolts and seals size 4	N/A	N/A
4	1	Base excl. cable, size 4	N/A	N/A
5	1	Plug for Base	N/A	N/A

8.2. Robot Cables

The maximum robot connection from the robot arm to the Control Box is 12 m. Improper robot connection can result in loss of power to the robot arm.

Connecting the Base Flange Cable directly to any Control Box can result in equipment or property damage.



For more info about cable options go to: https://www.universal-robots.com/articles/ur/e-series-cable-options

NO.	DESCRIPTION	PART NUMBER	MATERIAL	LENGTH	DIAMETER
1	Robot Cable Standard	165100	PVC	6 m	12.1 mm
		165101	PVC	12 m	12.1 mm

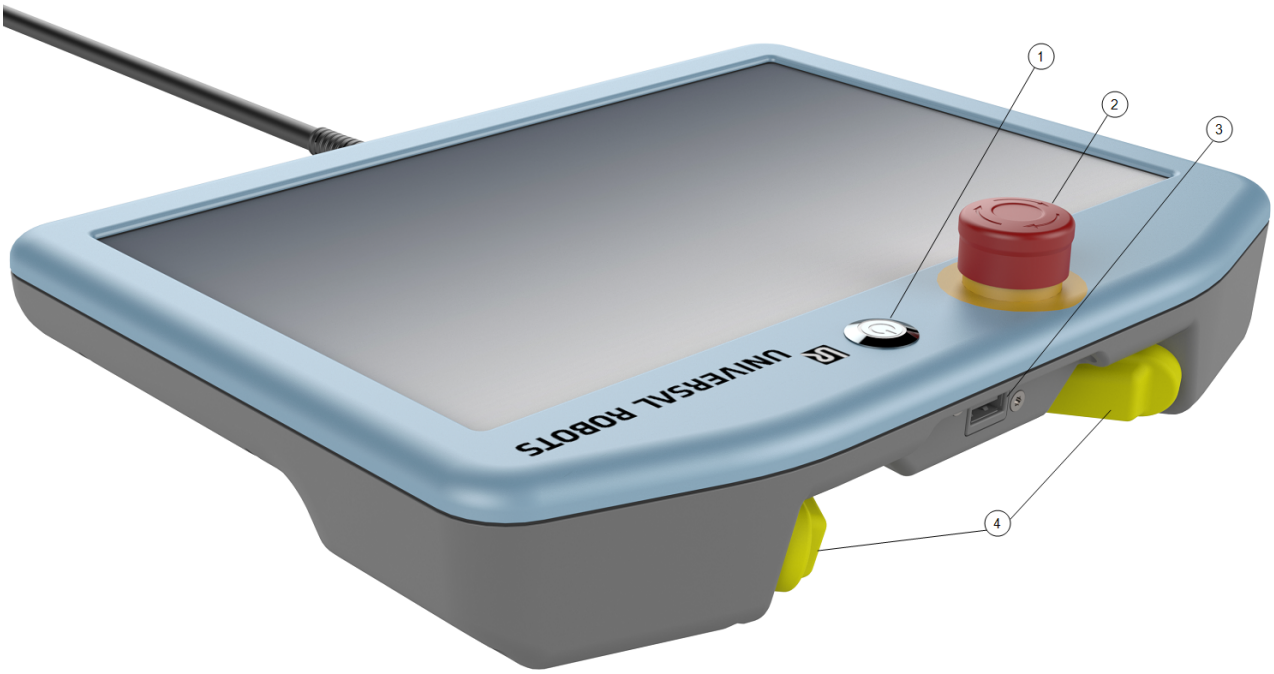
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NO.	DESCRIPTION	PART NUMBER	MATERIAL	LENGTH	DIAMETER
2	Robot Cable HiFlex	166100	PUR	6 m	13.4 mm
		166101	PUR	12 m	13.4 mm

8.3. 3PE Teach Pendant - 124191

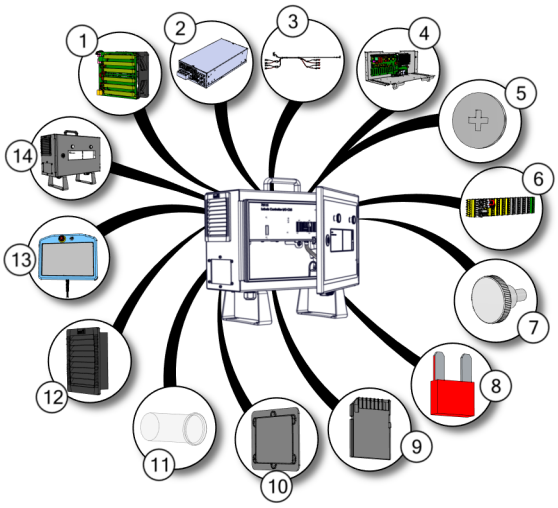
Return to overview



3-Position Enabling (3PE) Teach Pendant - 124191				
NO.	QTY.	DESCRIPTION	PART NUMBER(S)	PAGE NO.
1	1	3-Position Enabling Teach Pendant	124191	1

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8.4. Control Box



asdfs

Click on the page no. in the right column to see part in detail or go to the page.

NO.	DESCRIPTION	PART NUMBER(S)	PAGE NO.
1	Fan & Energy Eater	122750	8.4.1. Filter-Fan-EnergyEater assembly for CB 5.1 - 122750 on the facing page
2	Power Supply	177525/177526/177005	8.4.2. Power Supply Unit for UR3e - 177525 on page 212
3	Wire bundle Power Supply Unit	164071/164072	8.4.5. Wire bundle from Power Supply to Safety Control Board UR3e - 164071 on page 213
4	Control Board	124511	8.4.7. Safety Control Board Assembly for UR3e/ UR5e/ UR10e/ UR16e - 124511 on page 214
5	Battery for Control Board	170009	8.4.8. Battery CR2450 for Safety Control Board Assembly - 170009 on page 215
6	Terminals for Control Board	104007	8.4.9. Terminal set for IOs in Safety Control Board - 104007 on page 215
7	Teach Pendant and Control Box mounting bolt	105202	8.4.10. Teach Pendant and Control Box mounting bolts - 105202 on page 216
8	Fuse for Control Board	170008	8.4.11. Fuse for IOs in Control Board - 170008 on page 217
9	SD Card for Control Board	170010/170013	8.4.12. SCD card for Control Board - 170011/170013/170014 on page 217
10	Cover plate with seal for Control Box	103240	8.4.13. Cover plate with seal - 103240 on page 218

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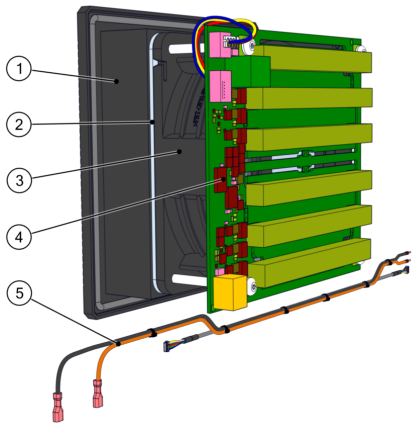
11	ight Pipe for Control Box	170007	8.4.14. Light pipes for control box - 170007 on page 218
12	Fan housing and filter for Control Box	104008/170020	8.4.15. Fan housing and filter for Control Box - 104008/170020 on page 219
13	Teach Pendant	124091	8.4.17. Standard Teach Pendant - 124091 on page 220
14	Control Box	124500/124510	8.4.18. Control Box 5.2 - 102403 (UR3e) /102400 (UR5e, UR10e, UR16e) on page 221

NOTE

If nothing is mentioned, the parts will also fit OEM version Control Box.

8.4.1. Filter-Fan-EnergyEater assembly for CB 5.1 - 122750

Return to overview

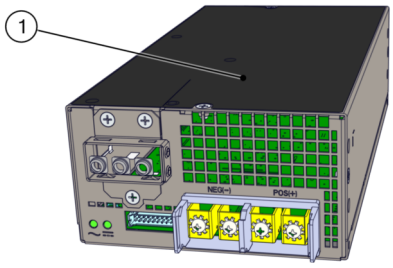


Filter-Fan-EnergyEater f. CB 5.1 - 122750				
NO.	QTY.	DESCRIPTION	PART NUMBER (S)	PAGE NO.
1	1	Housing for filter incl. filter sheet	104008	8.4.15. Fan housing and filter for Control Box - 104008/170020 on page 219
2	1	Plate Fan Spacer Disc	N/A	N/A
3	1	Fan	N/A	N/A
4	1	Energy Eater PCB	N/A	N/A
5	1	Wire bundle	N/A	N/A

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8.4.2. Power Supply Unit for UR3e - 177525

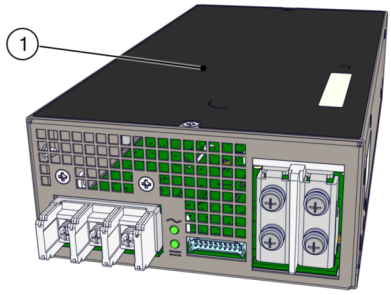
Return to overview



Power Supply for UR3e - 177525				
NO.	QTY.	DESCRIPTION	PART NUMBER(S)	PAGE NO.
1	1	Power Supply Unit for UR3e	177525	1

8.4.3. Power Supply Unit for UR5e/UR10e/UR16e/OEM AC - 177526

Return to overview

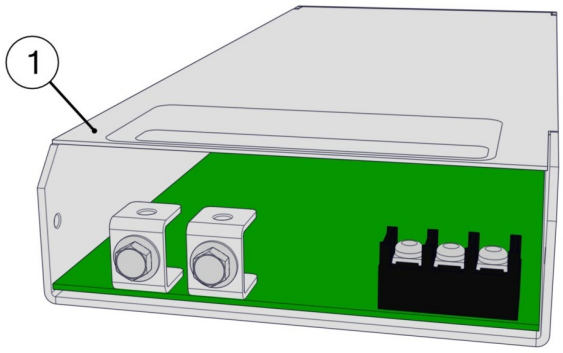


Power Supply for UR5e/UR10e/UR16e/OEM AC - 177526				
NO.	QTY.	DESCRIPTION	PART NUMBER (S)	PAGE NO.
1	1	Power Supply Unit for UR5e/ UR10e/ UR16e/ OEM AC	177526	1

8.4.4. Power Supply Unit for OEM DC - 177005

Return to overview

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Power Supply for OEM DC - 177005				
NO.	QTY.	DESCRIPTION	PART NUMBER(S)	PAGE NO.
1	1	Power Supply Unit for OEM DC	177005	1

8.4.5. Wire bundle from Power Supply to Safety Control Board UR3e - 164071

Return to overview

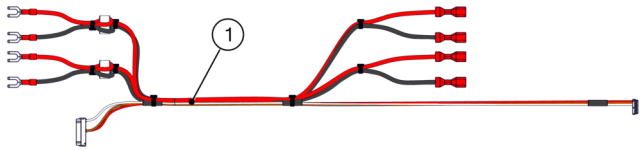


Wire bundle from Power Supply to Safety Control Board UR3e - 164071				
NO.	QTY.	DESCRIPTION	PART NUMBER(S)	PAGE NO.
1	1	Wire bundle from Power Supply to Safety Control Board UR3e	164071	1

8.4.6. Wire bundle from Power Supply to Control Board UR5e/UR10e/UR16e/OEM AC - 164072

Return to overview

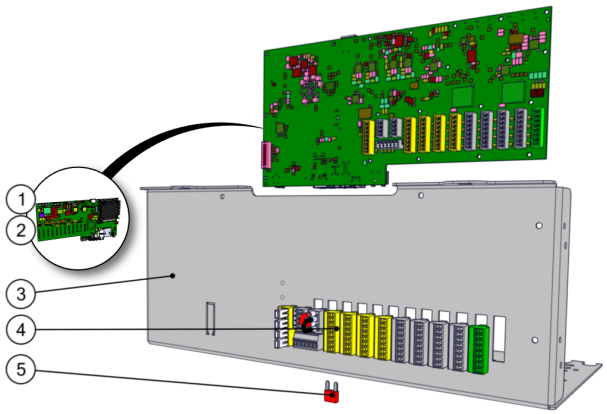
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Wire bundle from Power Supply to Safety Control Board UR5e/UR10e/UR16e/OEM AC- 164072				
NO.	QTY.	DESCRIPTION	PART NUMBER (S)	PAGE NO.
1	1	Wire bundle from Power Supply to Safety Control Board UR5e, UR10e, UR16e, OEM AC	164072	1

8.4.7. Safety Control Board Assembly for UR3e/ UR5e/ UR10e/ UR16e - 124511

Return to overview

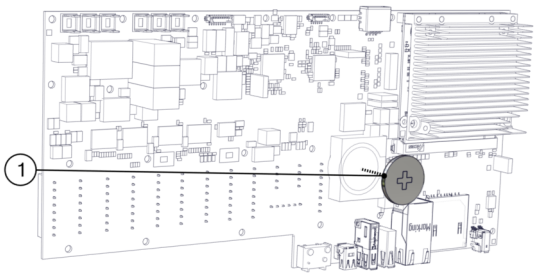


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Safety Control Board Assembly for UR3e/ UR5e/ UR10e/ UR16e - 124511				
NO.	QTY.	DESCRIPTION	PART NUMBER (S)	PAGE NO.
1	1	Safety Control Board PCB	N/A	N/A
2	1	Battery for Safety Control Board PCB - CR2450	170009	8.4.8. Battery CR2450 for Safety Control Board Assembly - 170009 below
3	1	Safety Control Board Bracket	N/A	N/A
4	1	Safety Control Board Terminal set for IOs	104007	8.4.9. Terminal set for IOs in Safety Control Board - 104007 below
5	1	Fuse Mini Blade 10A	170008	8.4.11. Fuse for IOs in Control Board - 170008 on page 217

8.4.8. Battery CR2450 for Safety Control Board Assembly - 170009

Return to overview

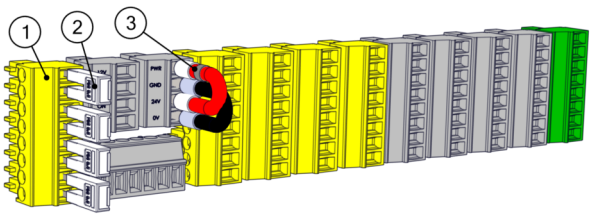


Battery for Control Board PCB - 170009				
NO.	QTY.	DESCRIPTION	PART NUMBER (S)	PAGE NO.
1	1	Battery CR2450 for Safety Control Board Assembly	170009	1

8.4.9. Terminal set for IOs in Safety Control Board - 104007

Return to overview

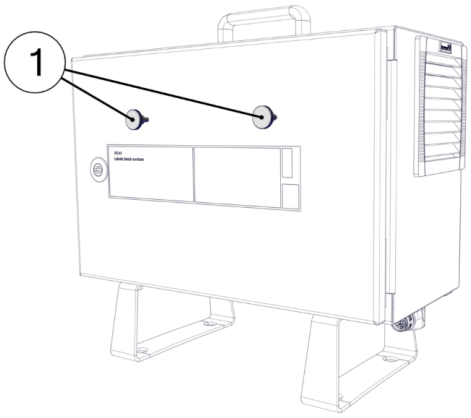
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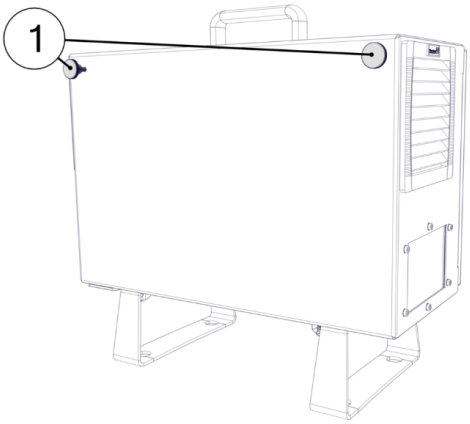


Terminal set for IOs in Safety Control Board - 104007				
NO.	QTY.	DESCRIPTION	PART NUMBER(S)	PAGE NO.
1	13	Terminals for Safety Control Board	104007	1
2	4	Jumpers for Safety Terminal	N/A	N/A
3	2	Jumpers for external 24V power	N/A	N/A

8.4.10. Teach Pendant and Control Box mounting bolts - 105202

Return to overview



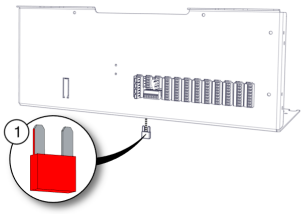


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Teach Pendant and Control Box mounting bolts - 105202				
NO.	QTY.	DESCRIPTION	PART NUMBER (S)	PAGE NO.
1	10	Teach Pendant and Control Box mounting bolts	105202	1

8.4.11. Fuse for IOs in Control Board - 170008

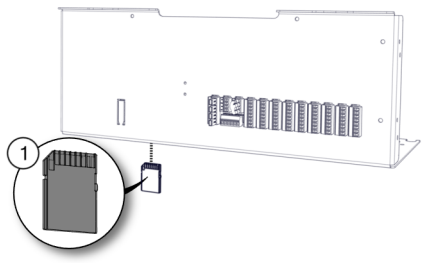
Return to overview



Fuse for Control Board - 170008				
NO.	QTY.	DESCRIPTION	PART NUMBER(S)	PAGE NO.
1	10	Fuse Mini Blade 10A	170008	1

8.4.12. SCD card for Control Board - 170011/170013/170014

Return to overview



SCD Card for Control Board incl. Software and License - 170013/170014				
NO.	QTY.	DESCRIPTION	PART NUMBER(S)	PAGE NO.
1	1	SCD Card with SW and Serial Number PRE 2020	170013	1

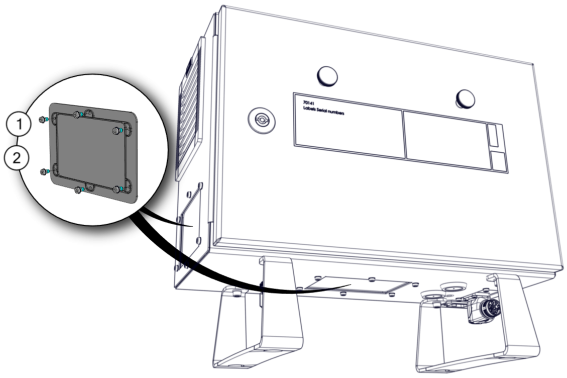
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SCD card with SW and Serial Number AFTER 2020 - 170014				
NO.	QTY.	DESCRIPTION	PART NUMBER (S)	PAGE NO.
1	1	SCD card with SW and Serial Number AFTER 2020	170014	1

SCD Card 4GB SLC after 2020 - 170011				
NO.	QTY.	DESCRIPTION	PART NUMBER(S)	PAGE NO.
1	1	SCD Card 4GB SLC after 2020	170011	1

8.4.13. Cover plate with seal - 103240

Return to overview



Cover plate with seal for Control Box - 103240				
NO.	QTY.	DESCRIPTION	PART NUMBER(S)	PAGE NO.
1	2	Cover plate with seal for Control Box	103240	1
2	12	Screw and tooth washer for cover plate	N/A	N/A

8.4.14. Light pipes for control box - 170007

Return to overview

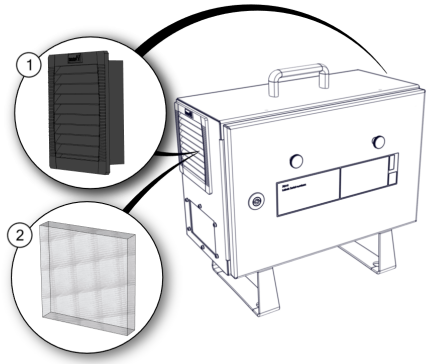
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Light pipes for control box - 170007				
NO.	QTY.	DESCRIPTION	PART NUMBER(S)	PAGE NO.
1	2	Light Pipes for Control Box	170007	1

8.4.15. Fan housing and filter for Control Box - 104008/170020

Return to overview



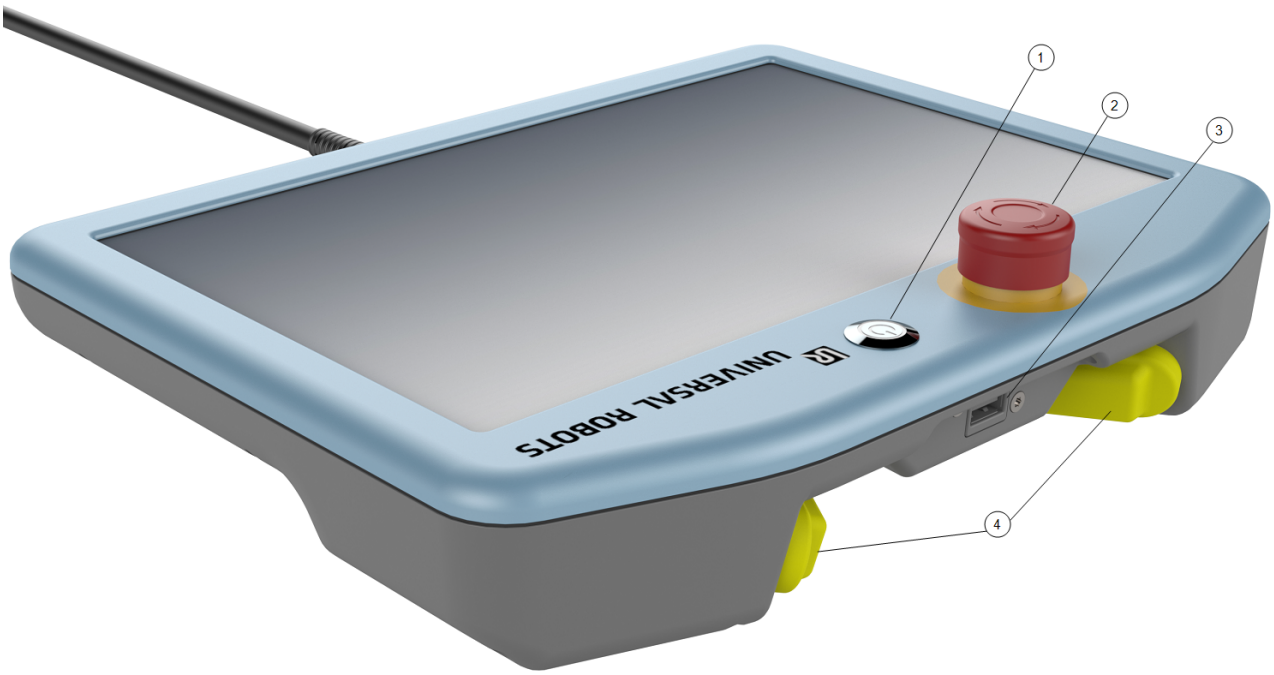
Housing and filter for Control Box incl. filter sheets - 104008				
NO.	QTY.	DESCRIPTION	PART NUMBER(S)	PAGE NO.
1	1	Housing for Control Box	104008	1
2	5	Filter material sheets	170020	1

Filter material sheets - 170020				
NO.	QTY.	DESCRIPTION	PART NUMBER(S)	PAGE NO.
2	5	Filter material sheets	170020	1

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8.4.16. 3PE Teach Pendant - 124191

Return to overview

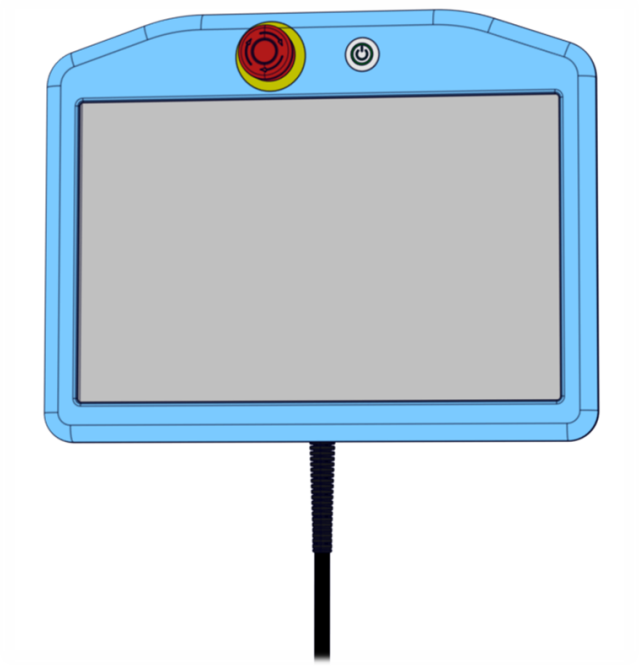


3-Position Enabling (3PE) Teach Pendant - 124191				
NO.	QTY.	DESCRIPTION	PART NUMBER(S)	PAGE NO.
1	1	3-Position Enabling Teach Pendant	124191	1

8.4.17. Standard Teach Pendant - 124091

Return to overview

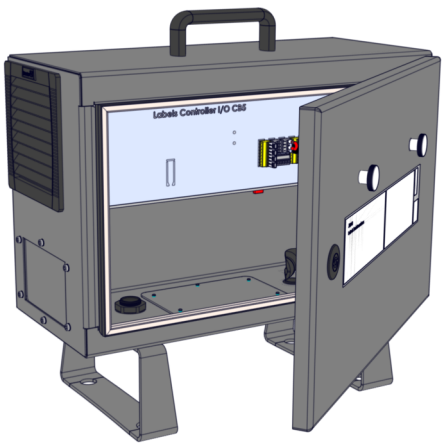
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Standard Teach Pendant - 124091				
NO.	QTY.	DESCRIPTION	PART NUMBER(S)	PAGE NO.
1	1	Teach Pendant	124091	1

8.4.18. Control Box 5.2 - 102403 (UR3e) /102400 (UR5e, UR10e, UR16e)

Return to overview

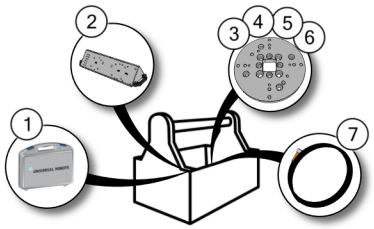


Control Box 5.2 for UR3e excluding Teach Pendant - 102403				
NO.	QTY.	DESCRIPTION	PART NUMBER (S)	PAGE NO.
1	1	Control Box for UR3e excluding Teach Pendant	102403	1

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Control Box 5.2 for UR5e/UR10e/UR16e excluding Teach Pendant - 102400				
NO.	QTY.	DESCRIPTION	PART NUMBER (S)	PAGE NO.
1	1	Control Box for UR5e/UR10e/UR16e excluding Teach Pendant	102400	1

8.5. Tools



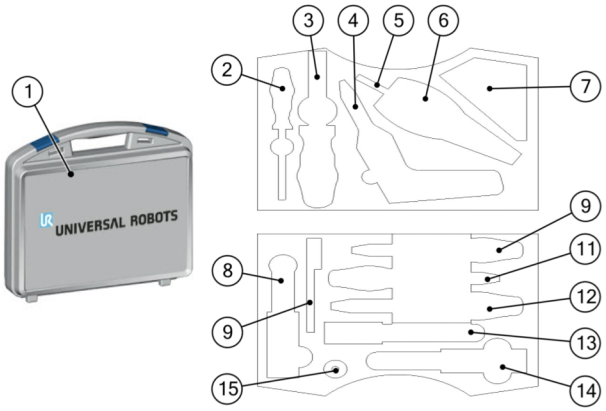
Click on the page no. in the right column to see part in detail or go to the page.

NO.	DESCRIPTION	PART NUMBER (S)	PAGE NO.
1	Service Tools - UR3e/UR5e/UR10e/UR16e	109011	8.5.1. Service tool set - 109011 on the facing page
2	Dual Robot Calibration Tooling Complete	185500	8.5.2. Dual Robot Calibration Tooling - 185500 on page 224
3	Mounting plate Robot Arm UR5e (Item profile)	131501	8.5.3. Mounting plate Robot Arm UR5e (Item profile) - 131501 on page 225
4	Mounting plate Robot Arm UR5e (BOSCH profile)	131501	8.5.4. Mounting plate Robot Arm UR5e (BOSCH profile) - 131502 on page 226
5	Mounting plate Robot Arm UR3e (Item & BOSCH profile)	131502	8.5.5. Mounting plate Robot Arm UR3e (Item & BOSCH profile) - 135103 on page 226
6	Mounting plate Robot Arm UR5e/UR10e/UR16e (Item & BOSCH profile)	131503	8.5.6. Mounting plate Robot Arm UR5e/UR10e/UR16e (Item & BOSCH profile) - 131510 on page 227
7	Cable for tool external	131510	1

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8.5.1. Service tool set - 109011

Return to overview



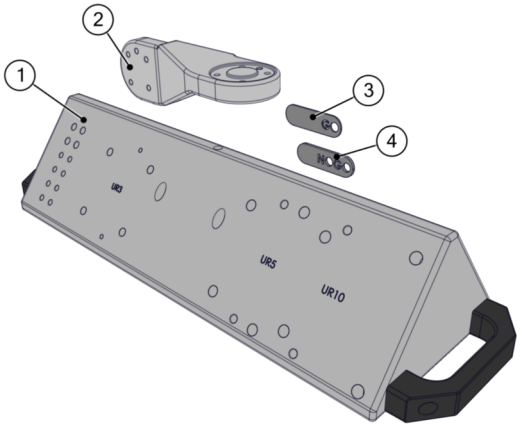
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Service Tool set - 109011				
NO.	QTY.	DESCRIPTION	PART NUMBER (S)	PAGE NO.
1	1	Service tool set	109011	1
2	1	Screwdriver Flat 2.5	N/A	N/A
3	1	Multi-bit tool incl. bits	109117	N/A
4	1	Screwdriver hex key 4mm. - 5.0Nm for e-Series	109113	N/A
5	1	Socket bit 10mm. for Control Box	109118	N/A
6	1	Needle nose pliers ESD	109122	N/A
7	1	ESD Wrist band	109180	N/A
7	1	By-pass cable	N/A	N/A
8	1	Torque wrench hex 10.0mm. - 8.0Nm for CB-Series	109107	N/A
9	1	Spanner 5.5mm.	109101	N/A
9	1	Spanner 7.0mm.	109102	N/A
9	1	Spanner 10.0mm.	109110	N/A
10	1	Torque screwdriver ESD TX8 - 0.4Nm	109114	N/A
11	1	Torque screwdriver ESD TX10 - 1.3Nm	109115	N/A
12	1	Torque screwdriver ESD TX20 - 3.0Nm	109116	N/A
13	1	Torque wrench hex 5.5mm. - 1.3Nm for CB-Series	109105	N/A
14	1	Torque wrench hex 7.0mm. - 2.6Nm for CB-Series	109106	N/A
15	1	Torx TX10 bit for 109114	109120	N/A

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8.5.2. Dual Robot Calibration Tooling - 185500

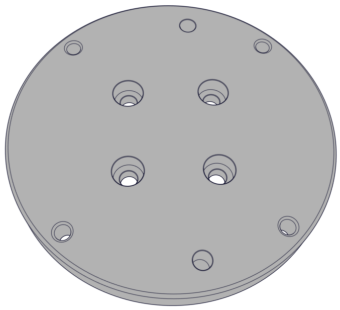
Return to overview



Dual Robot Calibration Tooling - 185500				
NO.	QTY.	DESCRIPTION	PART NUMBER(S)	PAGE NO.
1	1	Tooling Dual Robot Calib. Horse	185500	1
2	1	Tooling Dual Robot Calib. Tool Connector	185500	
3	1	TOOLING CALIB. GO TOOL	185500	
4	1	TOOLING CALIB. NOGO TOOL	185500	

8.5.3. Mounting plate Robot Arm UR5e (Item profile) - 131501

Return to overview

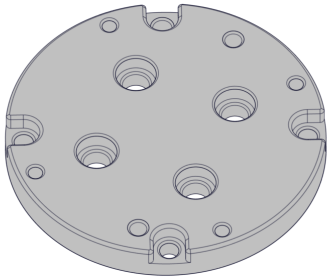


Mounting plate Robot Arm UR5e(Item profile) - 131501				
NO.	QTY.	DESCRIPTION	PART NUMBER (S)	PAGE NO.
1	1	Mounting plate Robot Arm UR5e(Item profile)	131501	1

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8.5.4. Mounting plate Robot Arm UR5e (BOSCH profile) - 131502

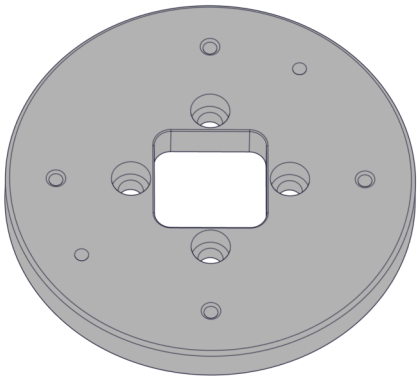
Return to overview



Mounting plate Robot Arm UR5e(BOSCH profile) - 131502				
NO.	QTY.	DESCRIPTION	PART NUMBER (S)	PAGE NO.
1	1	Mounting plate Robot Arm UR5e(BOSCH profile)	131502	1

8.5.5. Mounting plate Robot Arm UR3e (Item & BOSCH profile) - 135103

Return to overview

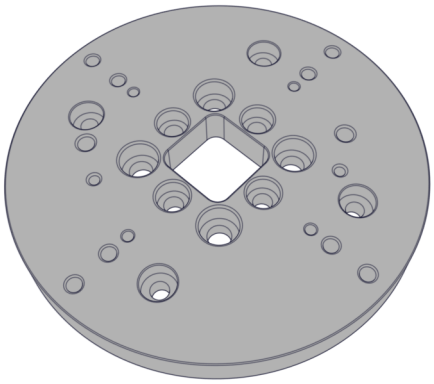


Mounting plate Robot Arm UR3e(Item & BOSCH profile) - 135103				
NO.	QTY.	DESCRIPTION	PART NUMBER(S)	PAGE NO.
1	1	Mounting plate Robot Arm UR3e (Item & BOSCH profile)	131503	1

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8.5.6. Mounting plate Robot Arm UR5e/UR10e/UR16e (Item & BOSCH profile) - 131510

Return to overview



Mounting plate Robot Arm UR5e/UR10e/UR16e(Item & BOSCH profile) - 131510				
NO.	QTY.	DESCRIPTION	PART NUMBER(S)	PAGE NO.
1	1	Mounting plate Robot Arm UR5e/UR10e/UR16e (Item & BOSCH profile)	131510	1

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9. Packing and Shipping of Robot/Spare Parts

Before shipping any robots or spare parts back to Universal Robots, please note the following

NOTICE

Remove external tools and external electrical connections before shipment.
Universal Robots may reject the shipment if third party products cannot be unmounted safely, or if they prohibit the execution of required post repair tests.
Universal Robots assumes no responsibility for the return shipment of third party goods.
Ensure the robot, Control Box, and Teach Pendant are packed responsibly.
Universal Robots will return Universal Robots products in original Universal Robots packaging.

NOTICE

The robot software/firmware is updated when repaired. New parts are also updated to their newest versions (hardware/software). Therefore, updating PolyScope may be necessary when new parts are mounted.

MANDATORY ACTION

If the robot/part(s) has been in contact with, or worked in environments, where dangerous chemicals or materials are present, it must be cleaned before shipment. If this is not possible, the shipment must be accompanied by an MSDA (Material Safety Data Sheet) in English and include instructions for cleaning. The amount of labor hours needed for cleaning will be billed at the standard rate.
If Universal Robots finds the robot/part unsafe to service, UR reserves the right to get the robot/part(s) cleaned or decline the case and send the part(s) back at customers expense.

Packing Down the Robot and Control Box for Shipment

1. Download the put_in_box program at: www.universal-robots.com/support
2. Upload the put_in_box program. See Section 5.2 Using Magic Files on how to do this.
3. Load the program and follow the instructions when running the program.
4. Power down, disconnect main power, and disconnect the Robot Arm from controller.
5. Pack the Robot Arm and Control Box in designated boxes. Ensure the Robot Arm is orientated correctly in the box.

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10. Change log

Date	Revision	Action	Changes
June 2018	1.0.0	Started	Service Manual e-Series English
August 2018	1.0.1	Corrected	Service tool part number
September 2018	1.0.2	Added	Descriptions to error codes
		Added	Inspection plan to section 3
October 2018	1.0.2	Added	Detailed spare parts list
March 2019	1.0.3	Correction	New icons for Notice and reading instructions
	1.0.3	Correction	Various text and image corrections
June 2019	1.1.4	Added	UR16e ref.
		Added	OEM AC and DC
		Correction	Various text and image corrections
October 2019	1.1.5	Change	Title and wording in section 3
November 2019	1.1.6	Corrected	Joint part numbers and references.
March 2020	1.1.8	Added	Update info on sections 5.1.1. Added info on 5.1.2, 5.1.3 and 5.2. Error codes update.
August 2020	n/a	Added	Robot Cable type description technical data.
September 2020	n/a	Updated	Updates for 3PE TP.
September 2020		Added	Update Error Codes

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