



# Palletizing *Solution* PE Series

## QUICK START GUIDE

For installation on  
Universal Robots



# THANK YOU FOR CHOOSING ROBOTIQ

This step-by-step guide will allow you to install and test your Robotiq Palletizing Solution PE Series on Universal Robots.



## 1. WHAT IS SUPPLIED?

Standard upon delivery of **SOL-PAL-UR-VAC-PDSTL** and **SOL-PAL-UR-PDSTL\***:

- 1 x Palletizing Solution base including:
  - 1 x Pedestal
  - 1 x Robotiq Controller
  - 4 x Pallet sensors
  - 1 x Cable management system
- 1 x Palletizing Solution post including:
  - 2 x Status lights
  - 1 x Teach pendant rack
  - 1 x Push button enclosure
- Concrete anchors
- 1 x Box detection sensor
- 1 x PowerPick Vacuum Gripper kit (Optional)
- 1 x Air filter kit (optional)
- 1 x Set of four (4) casters
- 1 x Material Handling Copilot software license dongle

\*SOL-PAL-UR-PDSTL does not contain the gripper, and as such the gripper installation steps do not apply.



## 2. SAFETY & WARNINGS

The operator(s) must have read and understood all of the Safety section in the user manual (available at support.robotiq.com).

The entire cell must go through a comprehensive risk assessment process before it can be used.

Do not operate the Palletizing Solution or even turn on the power supply before the device is firmly anchored and the machine area is cleared. Make sure the air supply is secured.

Make sure to follow all safety rules and regulations of your workplace. Always wear all recommended personal protective equipment in accordance with your workplace safety standards.

Failure to properly secure and install the equipment can result in material damage and bodily injury.



## 3. TOOLS NEEDED

Included	Not included
<ul style="list-style-type: none"><li>• 12.7mm (1/2 in) concrete drill bit (for use with hammer drill)</li><li>• 17mm Socket, 10 mm drive size</li><li>• 19 mm socket, 10mm drive size</li><li>• 2 mm hex key</li><li>• 3 mm hex key</li><li>• 4 mm hex key</li><li>• 5 mm hex key</li><li>• 6 mm hex key</li><li>• 10 mm hex key</li><li>• Optional:<ul style="list-style-type: none"><li>▪ 2.5 mm hex key</li><li>▪ 5.5-17 mm double ended wrench</li><li>▪ 20-21 mm double ended wrench</li></ul></li></ul>	<ul style="list-style-type: none"><li>• Power screwdriver</li><li>• #2 Phillips bit</li><li>• 2.5 mm slotted screwdriver</li><li>• Tube cutter</li><li>• Ratcheting socket wrench with 10mm (3/8 in) drive or adapter</li><li>• Torque wrench with 10mm (3/8 in) drive or adapter</li><li>• Isopropyl alcohol</li><li>• Hammer drill</li><li>• Hammer</li></ul>



## 4. UNBOXING



**The transport, lifting and moving** of the Palletizing Solution should be performed by qualified and authorized personnel. Failure to do so may result in material damage, bodily injury or death.

1. Remove the top panel and the four (4) sides of the crate by unscrewing the screws that hold them into place.
2. Remove the supporting wooden frame by unscrewing the screws that hold it into place.
3. Cut all the strapping material that retains the components, and take all cardboard boxes out of the crate.
4. Unscrew the two (2) bolts that retain the pedestal, and take the pedestal out of the crate.
5. Unscrew the two (2) screws that retain the teach pendant rack, and take the teach pendant rack out of the crate.
6. Remove the supporting wooden pieces by unscrewing the screws that hold them into place.
7. Unscrew the four (4) bolts that retain the base into the crate.
8. Take the base out of the crate.
9. Position the pedestal on the base.

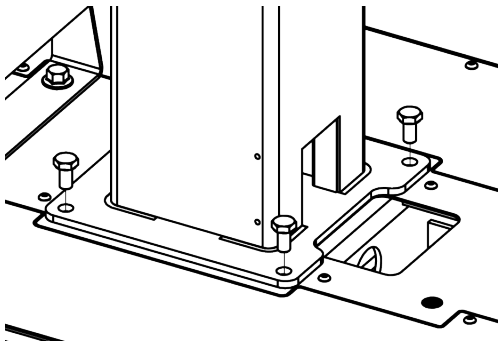


Be careful not to pinch the cables. If necessary, secure them before lifting and placing the pedestal on the base.



## 5. MECHANICAL & ELECTRICAL INSTALLATION

- Secure the pedestal on the base using the four (4) M10 screws provided. Required torque is 50 Nm.



To securely move the solution, you can use one of the two following methods:

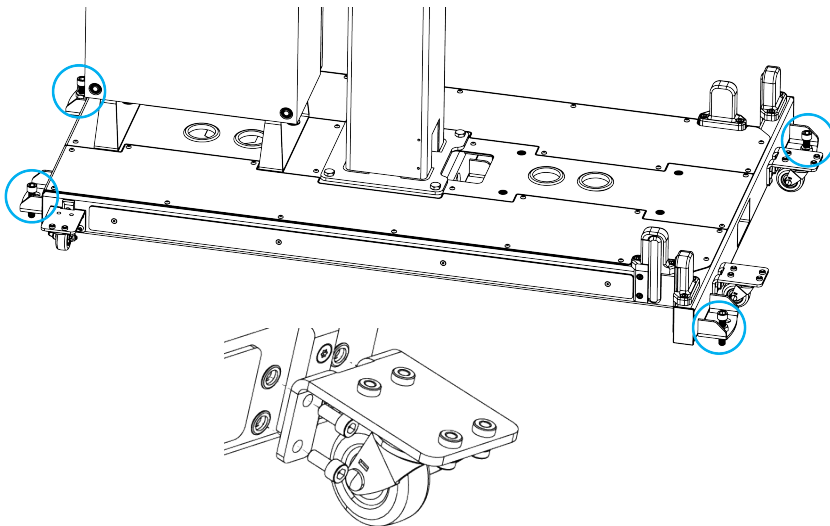
### Using a forklift



Pay attention to the center of gravity to prevent the equipment from tipping over. Make sure to secure and stabilize the Solution before moving it.

### Using the set of casters provided with the Solution

- Screw the four (4) provided corner bolts to lift the solution.
- Screw the four (4) casters into the base.
- Unscrew the corner bolts to set the solution down on its casters.



Do not use the Solution while it stands on its casters. To make the Solution stand upright, simply screw the four (4) corner bolts, remove the casters and unscrew the corner bolts.

### Robot Installation

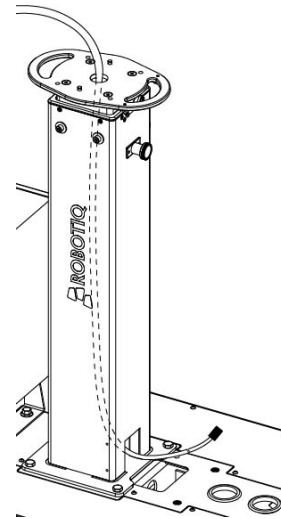
Depending on your robot, make sure to install screws of the right size:



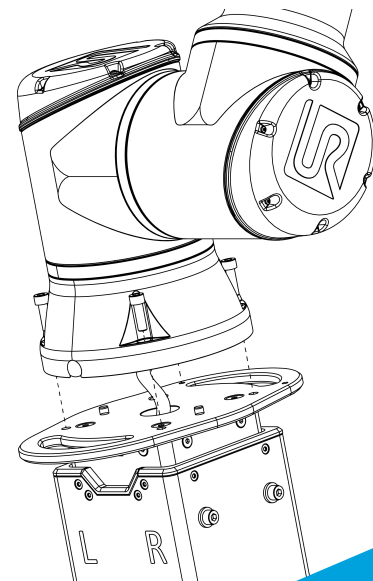
- **For e-Series:** use screws M8 x 25mm
- **For CB-Series:** use screws M8 x 22mm

### For e-Series Universal Robots

- Run the cable through the inner pedestal section and pull the cable out at the bottom of the pedestal.

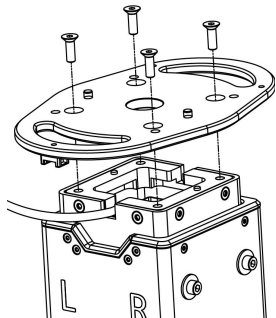


- Place the robot on the robot base plate so that the back of the robot (the side where the notch to let the power cable through the robot base is) is oriented towards the front of the Solution (towards the Robotiq Controller). Align properly with the two dowel pins (already installed on the robot base), and secure the robot using four (4) M8 x 25 mm screws and Belleville washers. **Required torque is 20 Nm.**

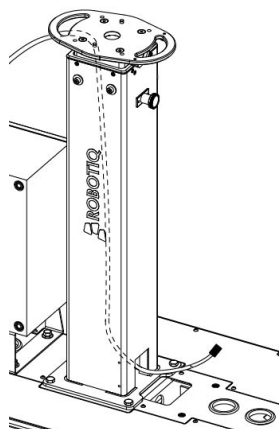


## For CB-Series Universal Robots

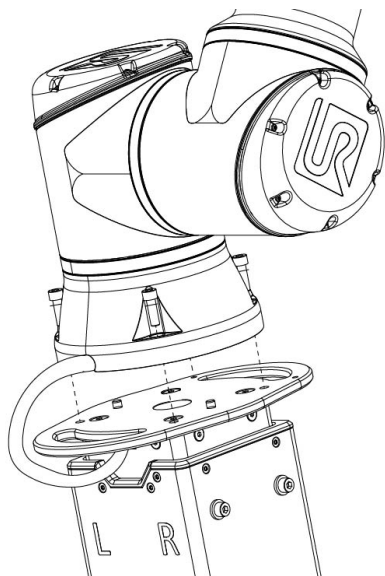
1. Unscrew the four (4) screws that hold the robot base plate. Then run the robot arm cable through the opening at the pedestal inner section.



2. Run the cable to the opening at the bottom of the pedestal.



3. Reposition the robot base plate and secure it with its four (4) screws.
4. Place the robot on the plate so that the back of the robot is oriented towards the Robotiq Controller. Align properly with the two dowel pins (already installed on the robot base), and secure the robot using four (4) M8 x 22mm screws and Belleville washers. **Required torque is 20 Nm.**

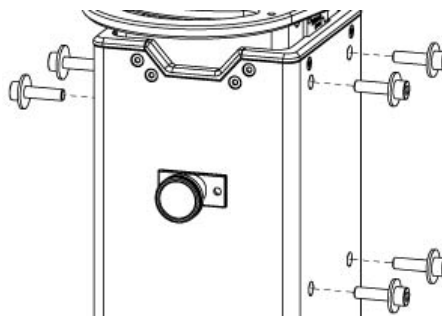


## Adjusting Pedestal Height



At least two people will be required to perform these installation steps since they consist in lifting material that weighs approximately 50 kg (110 lb).

1. Determine the required height based on your pallet and package configuration. Use the Robotiq Configurator to simulate your palletizing cell and obtain the exact required height (available at [designer.suite.robotiq.com](https://designer.suite.robotiq.com)).
2. Make sure the robot arm is folded in as much as possible.
3. Unscrew the six (6) screws that hold the pedestal in place, starting with the side that has two (2) screws.



4. While holding the inner pedestal section in place using the handles on the robot base plate, pull the plunger latch. Lift the inner pedestal section until it reaches the desired height. Release the plunger latch. The height markers on the left side of the inner pedestal section displays the actual height at which the robot arm stands.
5. Screw the pedestal back in place, starting with the side that has four (4) screws with a **15 Nm torque**. Then tighten the two (2) other screws with a **15 Nm torque**.

## Push Button Enclosure and Teach Pendant Rack

1. Screw the post at the front of the base using two (2) M6 x 20 mm screws and washers. Tuck excess cable into the base.
2. Unscrew the screws that hold the status lights into place. Orient the lights so that they stand upright, then tighten the screws.

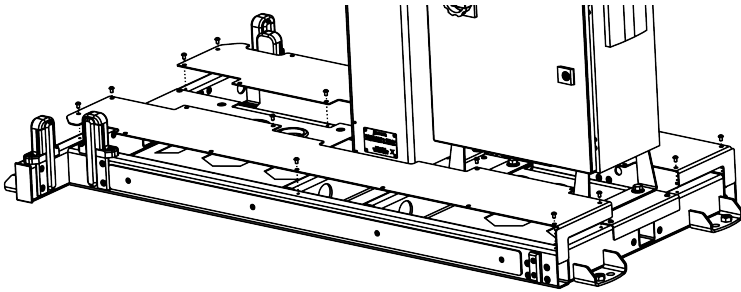


Do not invert light order (left/right) since they indicate the status of the pallet that is closest to each of them.

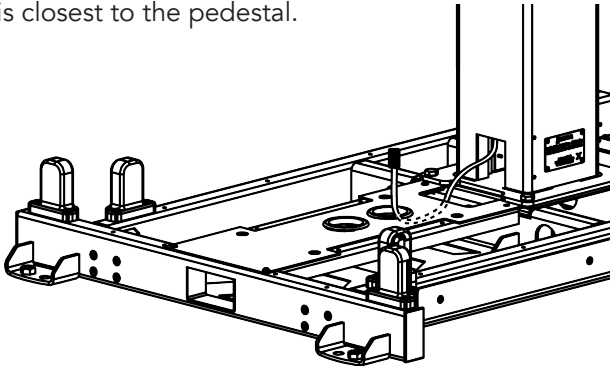
3. Once the Solution is at its final position, anchor it to the ground using the provided anchors. Refer to the **Anchoring the Solution** section if you need more information on the steps to follow.

## Cable Routing

1. Remove the cover plates.

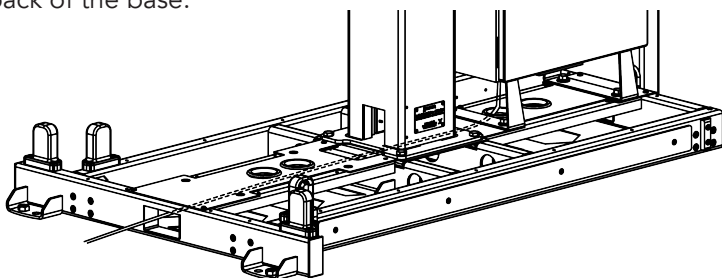


2. Run the cable of the Robotiq coupling through one of the holes in the back base plate.
3. Unroll the air supply tubing and make it run through the hole at the back of the base.
4. Run the robot power supply cable through the back base plate, and pull the connector through the hole that is closest to the pedestal.



5. Pull the Robotiq Controller power supply cable and Ethernet cable through one of the holes in the front base plate.
6. If required, connect the Teach Pendant cable to the corresponding socket on the robot controller. Run the cable through the hole at the front of the Solution base, if needed.
7. Optionally, and depending on your application, the stranded wires of the cable corresponding to the *Restart* and *Pause* buttons of the push button enclosure can be connected to the robot controller.
  - a. In preparation to do so, pull out the cable that is already routed from under the base, through one of the holes of the back base plate.

8. Use the power cable provided with the UR robot to power the Robotiq Controller. Pull the cable through the hole at the very back of the base.



9. Run the box sensor cable through the opening at the back of the base, and pull it out through one of the holes of the back base plate.

## Controller Installation and Connection

1. Install the UR controller and secure it using the four (4) M12 screws.
2. Connect the Robotiq Controller power output cable to the UR controller.
3. Connect the robot arm power output cable to the socket on the UR controller.
4. Open the UR controller. Connect the USB hub to a USB port.
5. Connect the Ethernet/USB converter cable to a USB port.
6. Connect the Ethernet cable to the Ethernet/USB adapter.

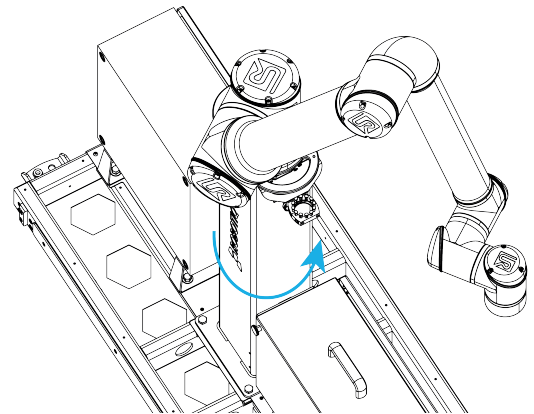
## Centering the Solution

1. Connect the power supply cable to a power outlet.
2. Power on the robot.
3. Make sure the six (6) screws that hold the pedestal in place are tight. **Required torque is 15 Nm.**
4. Unscrew half a turn the four (4) screws that secure the column onto the base.

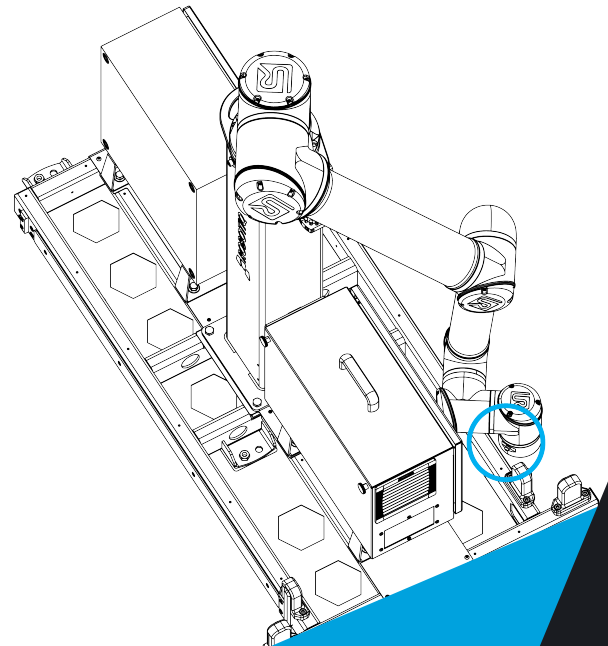


Do not unscrew completely. Unscrew only half a turn to be able to change the orientation of the column. Completely untightening the screws can cause the column to fall and cause bodily injuries and material damages.

5. Rotate the column counterclockwise as much as possible.



6. Position the robot so that the wrist is on the outside left side of the base as shown below.



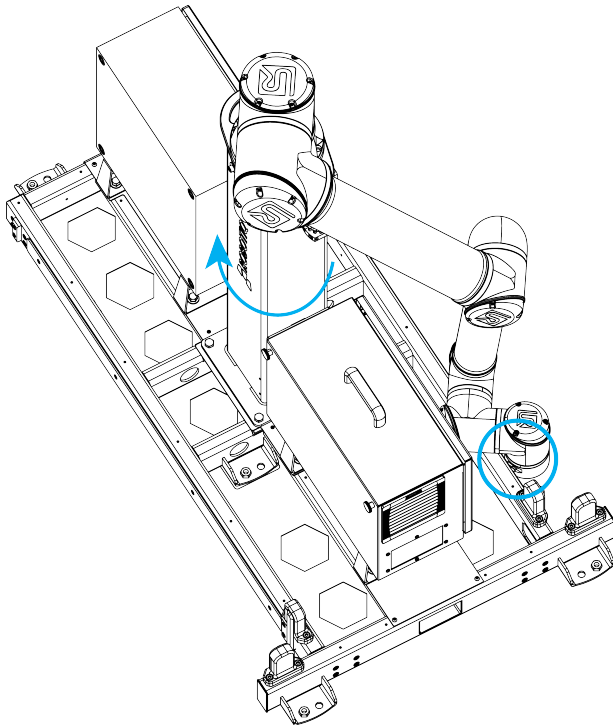
7. Move the robot so the robot tool flange is parallel to the ground: change the feature reference to Base and modify the tool position as follows: RX=0°, RY= 180°, RZ=0°.

8. Modify the Tool Position X value (base reference) to 333.35 mm (TCP must be 0).



Move the robot slowly and watch the movement to avoid collisions.

9. Rotate the column clockwise so that the side of the robot wrist touches the side of the base.



10. Tighten the four (4) screws to secure the column onto the base. **Required torque is 50 Nm.**

11. On the teach pendant, validate that the X value is still 333.35 mm.

12. Put the robot back in position of use.

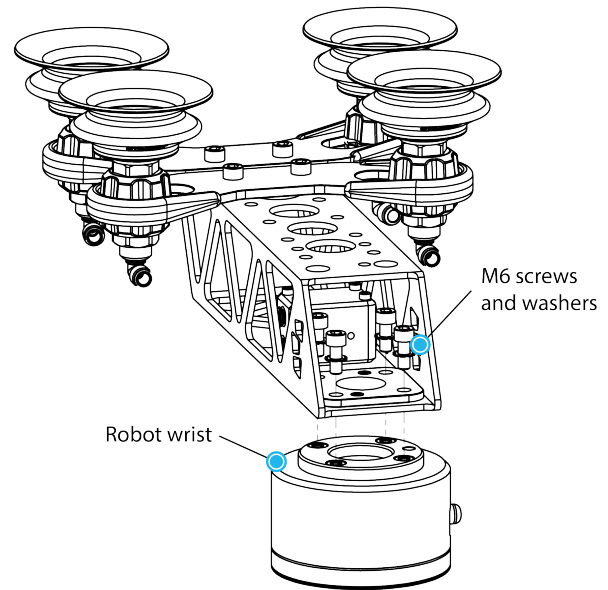
### PowerPick Vacuum Gripper Installation

Upon receipt, the PowerPick Gripper is already assembled with the 200 mm offset tube (default configuration). The following instructions explain how to mount this specific configuration. For other configurations installation, refer to the PowerPick Vacuum Gripper manual, available at [support.robotiq.com](http://support.robotiq.com).

1. To mount the Vacuum Gripper and its accessories, power on the robot and rotate the joints as described in the table below.

Joint	Position
Base	-180
Shoulder	-155
Elbow	-60°
Wrist 1	-80°
Wrist 2	270°
Wrist 3	-180

2. Using four (4) M6 screws and tooth lock washers, secure the Gripper on the robot tool flange. Align with the dowel pin. **Required torque is 9.5 Nm.**



### PowerPick Controller

1. With Isopropyl alcohol, clean the area where the PowerPick Controller will be placed.
2. Remove the protective layers from the double sided tape and install the PowerPick Controller on the Robotiq Controller, with pneumatic fittings pointing to the pedestal column. Leave at least 250 mm (10 in) between the PowerPick Controller and the pedestal to ensure that there is enough space to connect the air tubing and electrical cable.
3. Hold the controller 50 seconds to ensure a good grip.

### Cable Routing (image at bottom of page)



Use dry and filtered air only. Follow the ISO 8573-1, class 7.4.4 standard. The optimal pressure for compressed air consumption is 5.5 bar (80 psi).

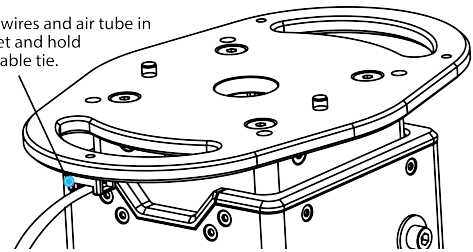
- To correctly position the cables, change the robot position. Refer to the table below:

Joint	Position
Base	-180
Shoulder	-155
Elbow	-60°
Wrist 1	-80°
Wrist 2	90°
Wrist 3	-90°

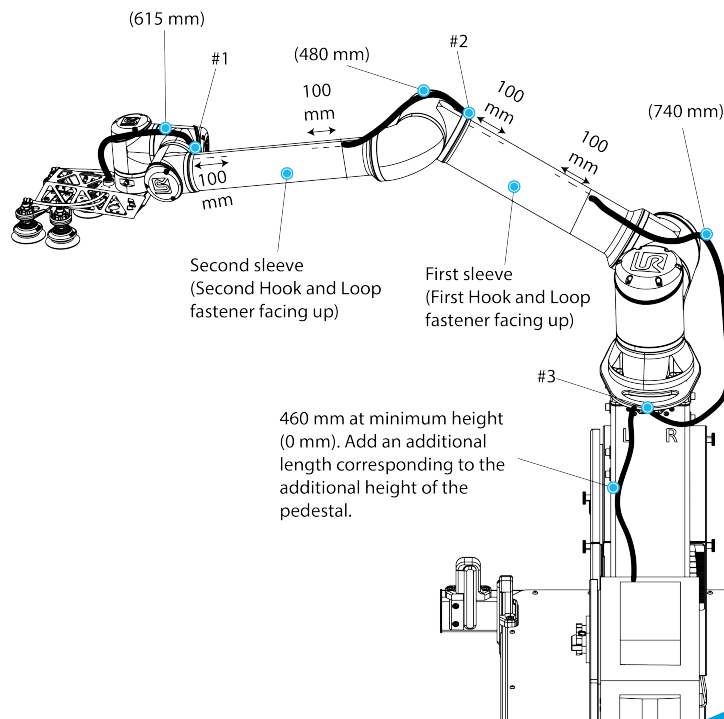
- Install the first sleeve:
  - Wrap a sleeve around the arm of the robot in a manner that, when facing the teach pendant, the sleeve is closed in a clockwise rotation.
  - Tighten the sleeve and close the first Hook and Loop fastener.
  - Push the sleeve until it touches the next joint of the robot and then rotate the sleeve **so the first Hook and Loop fastener is facing up**. This will ensure the good positioning of the cables.
- Install the second sleeve:
  - Wrap the other sleeve around the forearm of the robot in a manner that, when facing the teach pendant, the sleeve is closed in a clockwise rotation.
  - Tighten the sleeve and close the first Hook and Loop fastener.
  - Push the sleeve until it touches the next joint of the robot and then rotate the sleeve **so the second Hook and Loop fastener is facing up**. This will ensure the good positioning of the cables.

- Install eight pieces of double sided tape:
  - Take two pieces of double sided tape and remove one protective layer from each of them. Inside the first sleeve, in one end of the second Hook and Loop closure (**see the 100 mm marks on the image**), apply the two pieces of double sided tape side by side. Repeat for the other end. This will prevent the cables from moving inside the sleeve.
  - Repeat for the second sleeve.
- Locate 10 mm air tube section with the white labels: it will be connected to the Gripper.
  - Connect the 10 mm air tube to the Gripper.
  - In the first sleeve, remove the remaining protective layers from the double sided tape and place the air tube so the white label #1 is at the edge of the sleeve (gripper side).
  - Place the air tube along the sleeve and position it on the second double sided tape portion. Then close the sleeve.
  - In the second sleeve, remove the remaining protective layers from the double sided tape and place the air tube so the white label #2 is at the edge of the sleeve (gripper side).
  - Place the air tube along the sleeve and position it on the second double sided tape portion. Then close the sleeve.
  - Using a cable tie, attach the air tube to the bracket just under the robot base plate so the white label #3 is

Insert wires and air tube in bracket and hold with cable tie.



- Once the pedestal is at the right height, cut the air tube with a tube cutter at the required length to connect it to the PowerPick Controller (**P-** port).



- Remove the safety clip from the PowerPick Controller (**P+** port) and connect one extremity of the 8 mm air tube. Reinstall the safety clip.
- Run the air tube through the base via a hole under the Robotiq Controller. Make it run through the hole at the back of the base.
- Connect the 8 mm air tube to the provided filter kit (or the equivalent).
- Connect the filter kit to your local air supply device (air tube not provided).
- Shut down the robot and power off the Robotiq Controller.

### PowerPick Gripper and Copilot Connections


- Connect the Copilot license dongle to the USB hub in the UR controller. It must be connected at all times.
- Connect the M12 connector of the I/O cable to the PowerPick Controller.
- Run the cable to the robot controller via the base using the holes under the Robotiq Controller and the robot controller.
- Connect the height (8) wires of the I/O cable to the robot controller as described below.

Wire color	Connection
Blue	Analog Ground (AG)
Yellow	Analog Input (AI)
Gray	0V
Pink	Digital Output (DO)
White	0V
Brown	Digital Output (DO)
Red	24V
Green	Ground (GND)

### Push Button Enclosure Connection

Optionally, and depending on your application, the stranded wires of the cable corresponding to the *Restart* and *Pause* buttons of the push button enclosure can be connected to the UR controller.

- Run the cable to the UR controller.
- Refer to the **Robotiq Controller Connections** section available at the end of this document.

 Button signals are not redundant. Since they are actual Pause and Restart commands, they should not be construed as safeguarding devices.

### Box Sensor(s) Connection and Installation

- Run the box sensor(s) cable through a hole under the robot controller. Connect the three (3) wires of the cable to the robot controller as described below.

Wire color	Connection
Brown	24V
Blue	0V
Black	Digital Input (DI)

- Install each box sensor on a bracket that suits your setup with the provided screws.
- Position each box sensor bracket so it can detect the box(es) to be picked.
- Connect each box sensor M8 connector cable to its sensor.

### Anchoring the Palletizing Solution



The Solution must only be installed and anchored by qualified personnel. If you use the anchors provided with the Solution, it should be installed in 28 MPa [4000 psi] undamaged concrete (minimum).

- Position the Solution at its final position. Refer to the **Anchoring Pattern** available at the end of this document.
- Drill the six (6) holes with the provided drill bit.
- If necessary, level the Solution using shims.
- Place the anchors into the holes and fasten the nuts flush to the screws.
- Bang the anchors in place.
- Secure the Solution by screwing the six (6) nuts with a **torque of 54 Nm**.

### Finalization and Power On

- Reinstall the base covers using the provided screws.
- Install the pedestal cover using the provided screws.
- Connect the power cable to a power outlet.
- Power on the Robotiq Controller and the robot.



Make sure to do a risk assessment before starting to use the Solution.

### Joint Limits

- Go to **Installation** -> **Safety** -> **Joint Limits**
- Unlock the section with the proper password and change the **Elbow** and **Wrist 3** values as follows:

Joint	Minimum	Maximum
Elbow	-167°	3°
Wrist 3	-273°	273°



## 6. SOFTWARE & OTHER INFOS

To complete the installation and for all additional information about the Robotiq Palletizing Solution and its software, please refer to the corresponding sections of the instruction manual at [robotiq.com/support](https://robotiq.com/support)



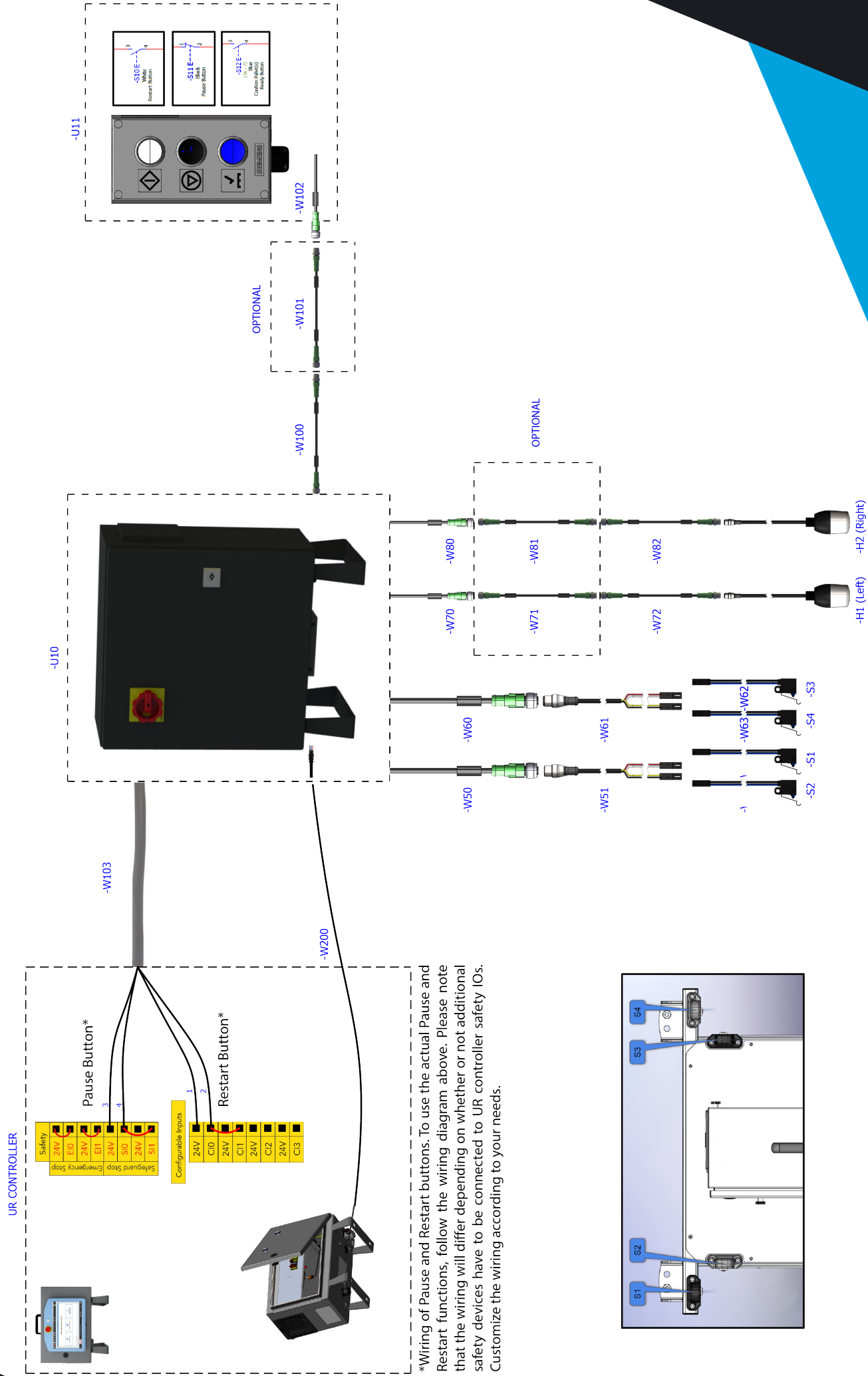
**ROBOTIQ**  
eLearning

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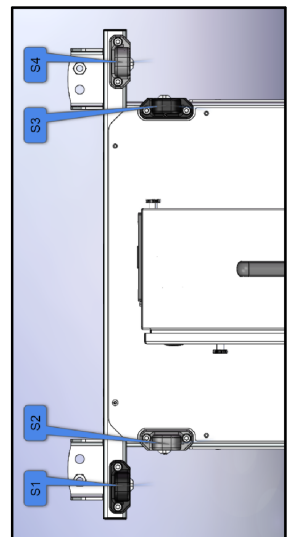




# Robotiq Controller Connections



\*Wiring of Pause and Restart buttons. To use the actual Pause and Restart functions, follow the wiring diagram above. Please note that the wiring will differ depending on whether or not additional safety devices have to be connected to UR controller safety IOs. Customize the wiring according to your needs.



# Anchoring Pattern

