



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***:

- Palletizing Solution base including:
 - 1 x Pedestal
 - 1x Robotiq Controller
 - 4 x Pallet sensors
 - 1 x Cable management system
- Palletizing Solution post including:
 - 2 x Status lights
 - 1 x Teach pendant rack
 - 1 x Push button enclosure
- Concrete anchors
- Box detection sensor
- Vacuum Gripper kit (Optional)
- Extra reach bracket for end-of-arm tooling
- 8mm air tube (already mounted on the column)
- Set of four (4) casters
- 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 must have read and understood all of the instructions in the user manual (available at support.robotiq.com) before operating the Robotiq Palletizing Solution.



The entire cell must go through a comprehensive risk assessment process before they 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.



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



Make sure to follow all safety rules and regulations of your workplace while using the Palletizing Solution.



Always wear all recommended personal protective equipment in accordance with your workplace's safety standards such as: safety glasses, steel-toe boots, etc.



3. TOOLS NEEDED

Included	Not included
<ul style="list-style-type: none">• 12.7mm (1/2 in) concrete drill bit (for use with hammer drill)• 19mm socket, 10mm drive size• 17mm Socket, 10 mm drive size• 2 mm hex key• 3 mm hex key• 4 mm hex key• 5 mm hex key• 6 mm hex key• 10 mm hex key	<ul style="list-style-type: none">• Power screwdriver• #2 Phillips bit• 2.5 mm slotted screwdriver• Utility knife• Ratcheting socket wrench with 10mm (3/8 in) drive or adapter• Torque wrench with 10mm (3/8 in) drive or adapter, minimum torque range of 15 - 50 Nm (11.0 - 36.9 ft-lb)• Hammer drill• Hammer



4. UNBOXING



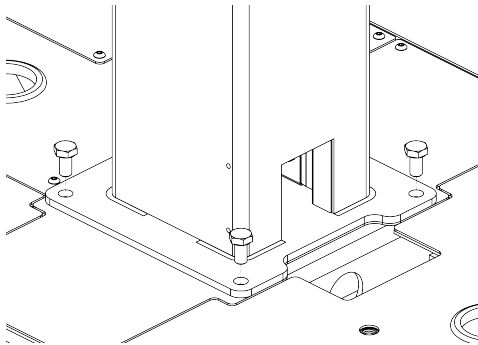
The transport, lifting and moving of the Robotiq Palletizing Solution should be performed by qualified and authorized personnel. Failure to do so may result to material damage, bodily injury or death.

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.

10. Secure the pedestal on the base using the four (4) M10 screws provided. Tighten to a torque of 50 Nm.



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

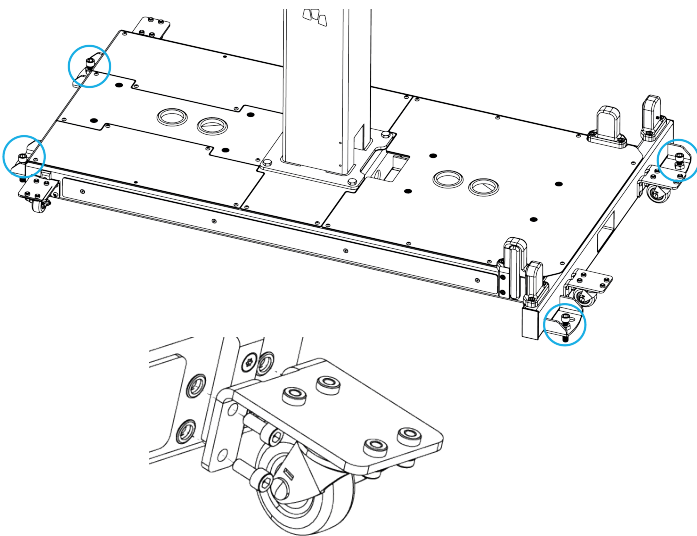
Using a forklift



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

1. Screw the four (4) provided corner bolts to lift the solution.
2. Screw the four (4) casters into the base.
3. 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.



5. MECHANICAL & ELECTRICAL INSTALLATION

Robot Installation

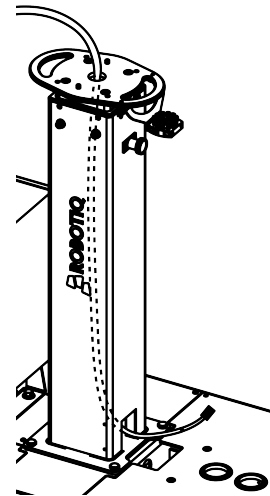


Depending on your cobot, make sure to install screws of the right size:

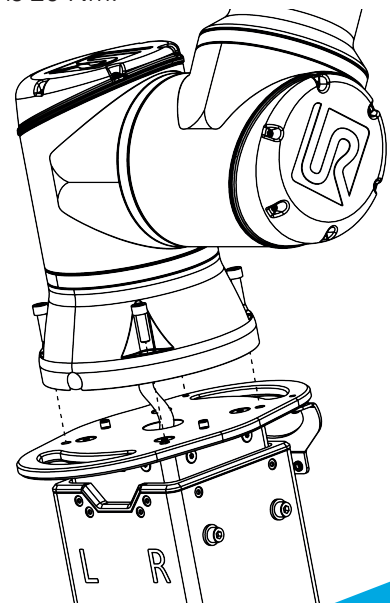
- **For e-Series:** use screws M8 x 25mm
- **For CB-Series:** use screws M8 x 22mm

For e-Series Universal Robots

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

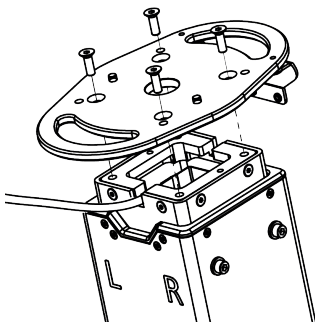


2. Place the robot on the robot base plate so that the back of the robot (the side on which is the notch to let the power cable through the robot base) is oriented towards the front of the Solution (towards the Robotiq Controller). Align properly with the two dowel pins (already installed on the robot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

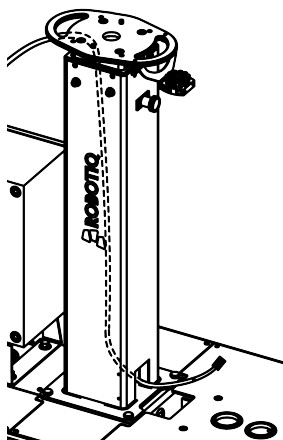


For CB-Series Universal Robots

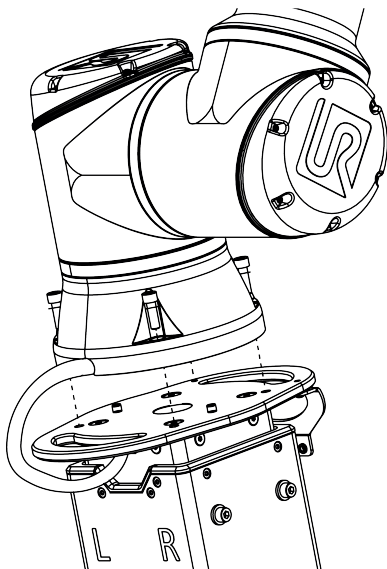
1. Unscrew the four (4) screws that hold the robot base plate.
2. Run the robot arm's cable through the opening at the back of the inner pedestal section.



3. Run the cable through to the opening at the bottom of the pedestal.



4. Reposition the robot base plate and secure it with its four (4) screws.
5. 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. The torque value required is 20 Nm.

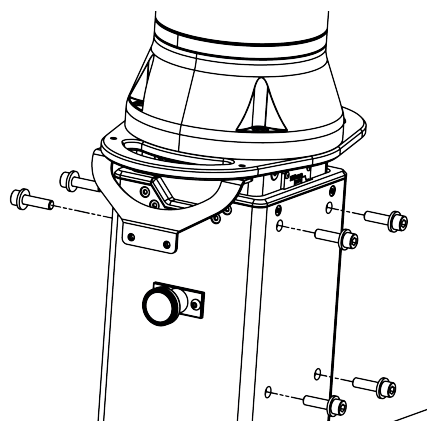


Adjusting Pedestal Height



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 height required based on your pallet and package configuration. Use the Robotiq Configurator to simulate your palletizing cell and obtain the exact height required. (available at 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 two (2) screws on the right side.



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 four (4) screws on the left side with a 15 Nm torque, then the two (2) screws on the right side, 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.
2. Unscrew the screws that hold the status lights into place. Orient the lights so that they stand upright, then tighten the screws.

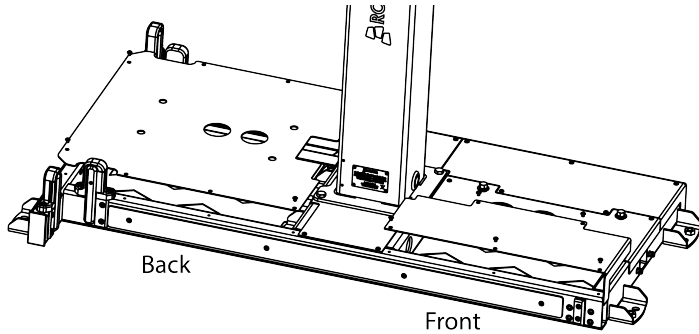


Do not invert light order (left/right) since they indicate the status of the pallet that is closest to each of them.

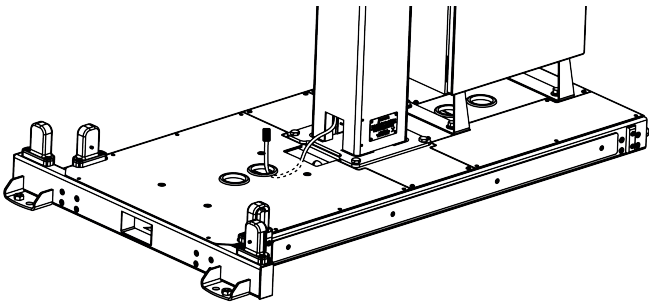
3. Once the Solution is at its final position, anchor it to the ground using the anchors provided. Please refer to the Anchoring the Solution section should you need more information on the steps to follow.

Cable Routing

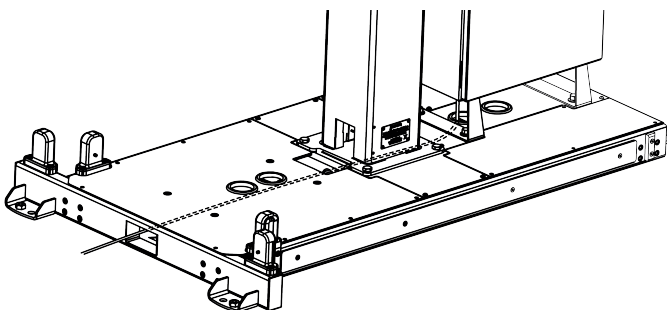
1. Remove the cover plates. Set the back cover plate aside, but still on the base.



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



5. Pull the Robotiq Controller's power supply cable and Ethernet cable through one of the holes in the front base cover plate.
6. If required, connect the Teach Pendant's cable to the corresponding socket on the UR controller. Run the cable through the hole at the front of the Solution's 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 UR controller.
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 push button enclosure's cable (ending with an M12 connector) through the hole at the front of the base, and pull it out through one of the holes in the front base cover.
10. Run the box sensor cable through the opening at the back of the base, and pull it out through one of the holes in the back base cover plate.
11. Reinstall the back base cover using the provided screws.

Controller Installation and Connection

1. Install the UR controller and secure it using the four (4) M12 screws.
2. Connect the power output cable of the Robotiq controller to the UR controller.
3. Connect the robot arm's 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.

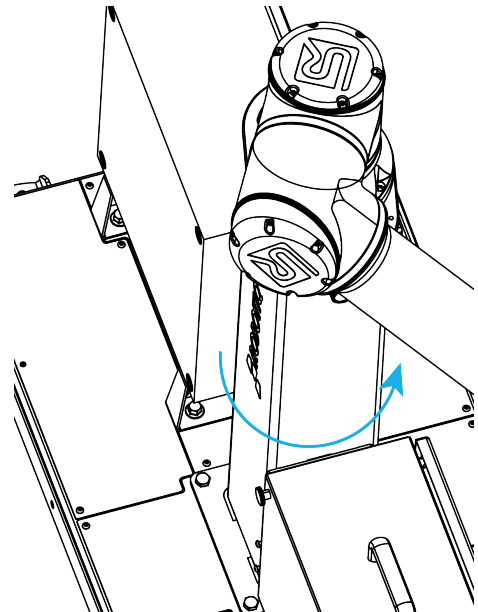
Centering the Solution

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. Torque required: 15 Nm.
4. Unscrew half a turn the four (4) screws that secure the column onto the base.

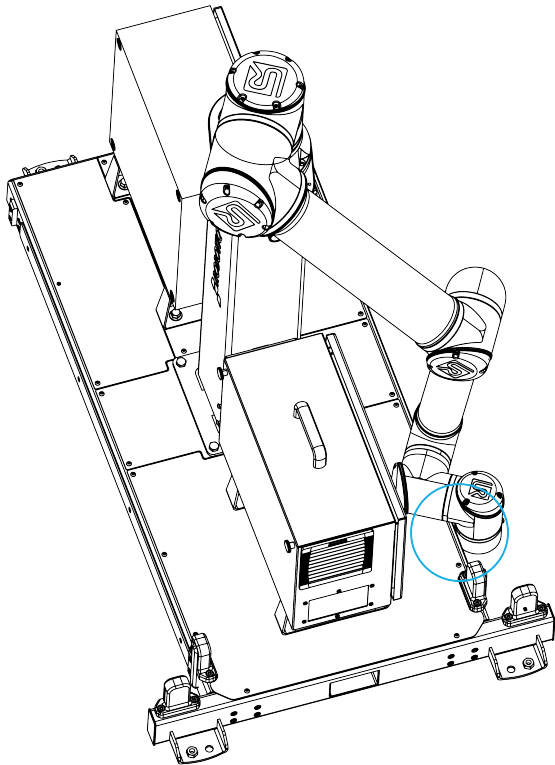


Do not unscrew completely. Unscrew only half a turn to be able to change the orientation of the column. Completely untightening the screws can cause the column to fall and cause bodily injuries and material damages.

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 like shown in the figure below.

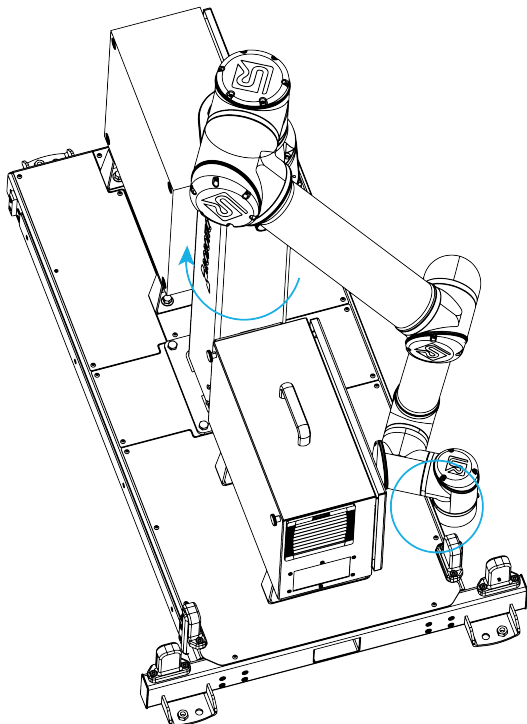


7. Move the robot so the robot tool flange is parallel to the ground: change the feature reference to Base and modify the tool position like the following: $RX=0^\circ$, $RY=180^\circ$, $RZ=0^\circ$.
8. Modify the Tool Position X value (base reference) to 333.35 mm (Make sure the TCP is set to 0.)



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. **Torque must be 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.

AirPick Gripper Installation

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

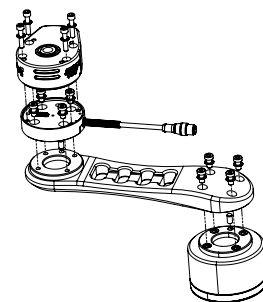
Joint	Position
Base	-180
Shoulder	-155
Elbow	-60°
Wrist 1	-80°
Wrist 2	270°
Wrist 3	-180

1. **If** additional reach is needed, install the extra reach gripper bracket on the robot tool flange using four (4) M6 screws and tooth lock washers and align properly with the dowel pin.



Install the bracket only if necessary. Consult the Configurator to find out if it is needed in your case. Available at designer.suite.robotiq.com

2. Using four (4) M6 screws and tooth lock washers, secure the coupling on the robot tool flange or on the extra reach gripper bracket.
3. Mount the Vacuum Gripper on the gripper coupling. Align with the dowel pin.
4. Secure by inserting the M5 screws and tooth lock washers.



If the two (2) or four (4) suction cups bracket is needed:

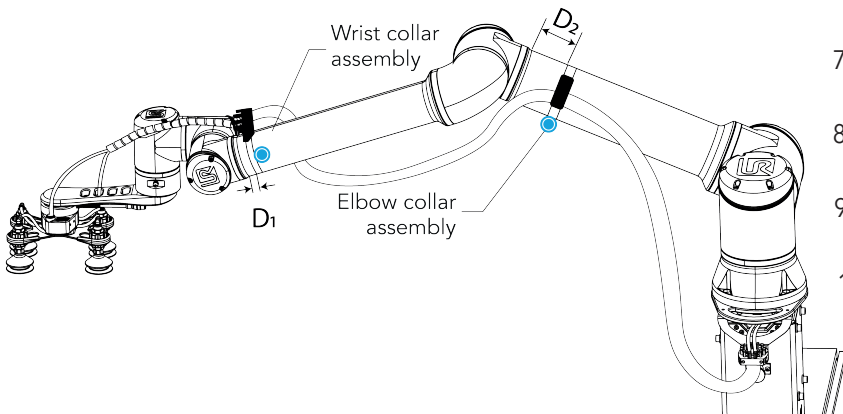
1. Align the flat surface on the manifold with the shoulder of the vacuum generator.
2. Secure the manifold by inserting screws and tooth lock washers in a cross pattern to properly compress the O-ring of the generator.
3. Insert each suction cup, with an O-ring, into an air node. Tighten cups by hands.

To finish the installation, 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°

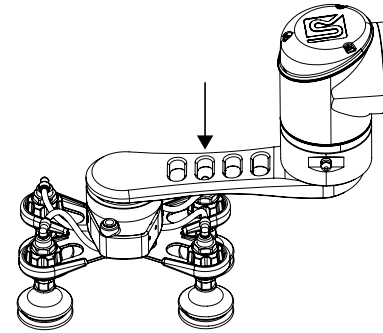
1. Attach the Igus triflex® R Series (TRE.40B) cable routing system to the robot, as illustrated in the figure below:

- Using a 5 mm hex key, secure the elbow collar assembly (larger collar) to the arm. Account for the orientation and distance from the elbow (D_2).
- Clip the mounting bracket of the elbow collar assembly on the cable carrier (align the bracket with the sticker shown in the chart).
- Using a 5 mm hex key, secure the wrist collar assembly (smaller collar) to the arm. Account for the orientation and distance from the wrist (D_1).



Robot model	Elbow bracket sticker	D_2	Wrist bracket sticker	D_1
UR10	D	180 mm	E	10 mm

2. If you use the extra reach bracket, run the coupling cable through the second hole of the bracket.



3. Connect the coupling cable to the connector visible at the end of the cable carrier.
4. Install Igus R-Lock clips at both ends of the cable carrier before clipping them in the brackets
5. Clip the mounting bracket of the wrist collar assembly on the cable carrier (align the bracket with the sticker shown in the previous chart).
6. Use cable ties to attach the tubing and cable to the strain relief part of the mounting bracket.



Make sure not to crush the tubing or the cable with the cable ties.

7. Cut the air tube at the right length (815 mm / 32 in) past the plastic strain relief.
8. Connect the 8 mm air tube to the vacuum generator. Ensure the safety clip is properly installed.
9. Use the spiral cable sleeve to keep the air tube and the coupling cable together.
10. Connect the other end of the air tube to your local air supply device.

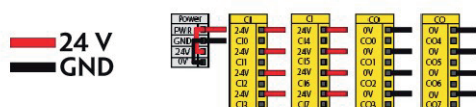


- Maximum pressure allowed is 7 bar (100 psi).
- Optimal pressure is 7 bar (100 psi).
- Dry and filtered air only; Follow ISO 8573-1, class 3.4.3 Standard.
- Use of a local pressure regulator with a filter and air dryer is recommended.

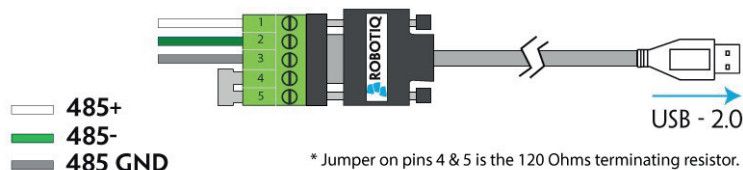
11. Shutdown the robot and power off the Robotiq controller.

AirPick Gripper and Copilot Connections

1. Connect the Copilot license dongle to the USB hub in the UR controller. It must be connected at all times.
2. Run the gripper's coupling cable to the UR controller.
3. Connect the white, green and bare wires to the Robotiq RS-485 signal converter. Also, connect the red (24V) and black (0V) wires to the terminal blocks of the UR controller.
4. Connect the USB cable to a USB port of the UR controller.



COMMUNICATION WIRING



Push Button Enclosure Connection

1. Connect the push button enclosure's cable to the M12 connector under the Robotiq Controller.
2. 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.
 - a. Run the cable to the UR controller.
 - b. Refer to the **Robotiq Controller Connections** section to connect the wires.



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

Box Sensor Connection and Installation

1. Run the box sensor's cable through a hole under the UR controller. Connect the brown (24V), blue (0V) and black (digital input) wires to corresponding connectors in terminal blocks.
2. Install the box sensor on the bracket that best suits your setup with the provided screws.
3. Position the sensor box's bracket so it can detect the box to be picked.
4. Connect the M8 connector of the box sensor's cable to the sensor.

Anchoring the Palletizing Solution



Make sure to follow all the safety rules and regulations of your workplace while using the Robotiq 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).

1. Position the Solution at its final position. (Refer to the Anchoring schema available at the end of this document)
2. Drill the six (6) holes with the provided drill bit.
3. If necessary, level the Solution using shims.
4. Place the anchors into the holes and fasten the nuts flush to the screws.
5. Bang the anchors in place.
6. Secure the Solution by screwing the six (6) nuts with a torque of 54 Nm (40 lb ft) .

Finalization and Power On

1. Reinstall the front base cover using the provided screws.
2. Install the pedestal cover using the provided screws.
3. Connect the power cable to the power outlet.
4. Power on the Robotiq controller and the robot.



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



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

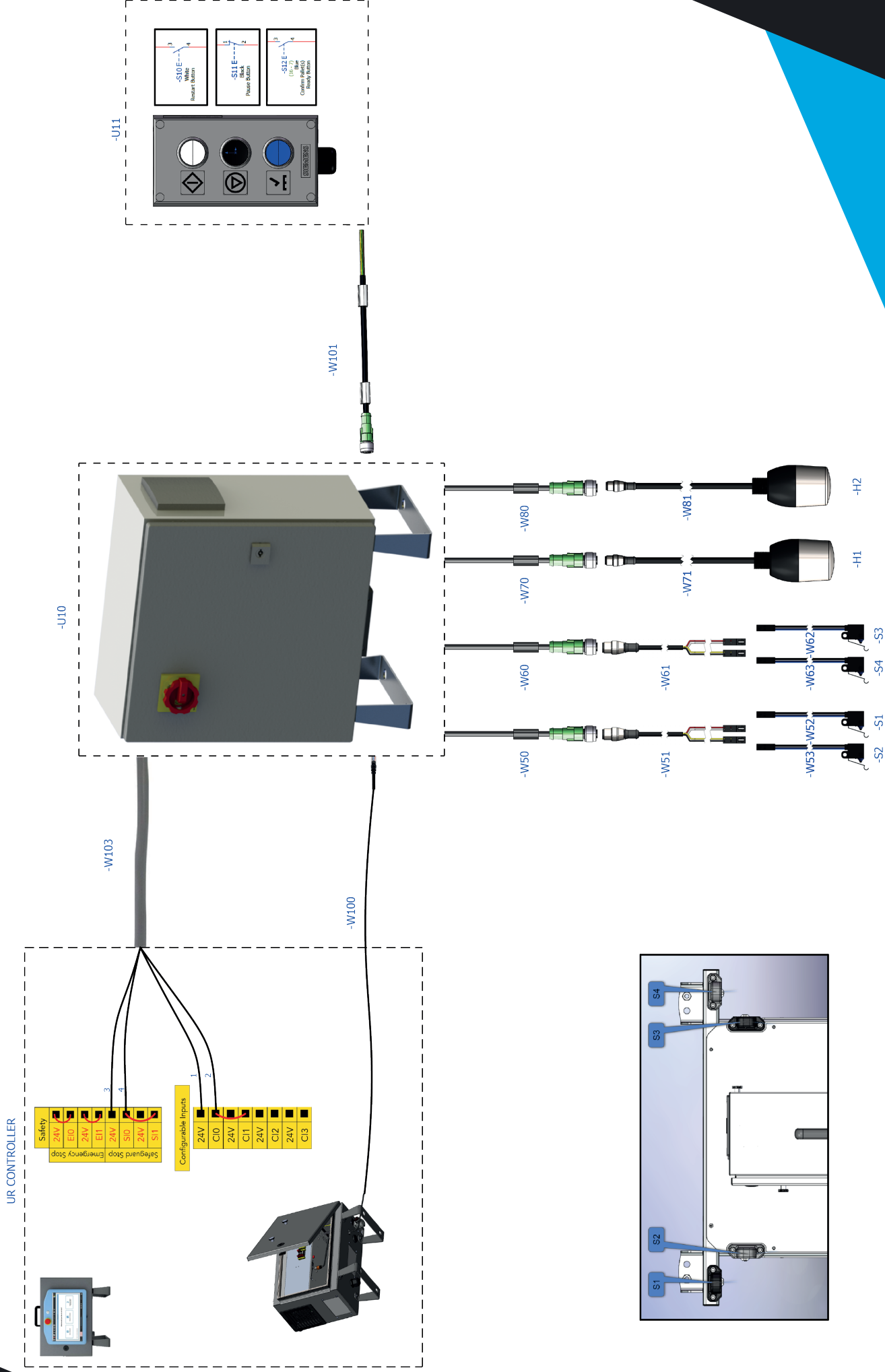


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Robotiq Controller Connections



Anchoring Pattern

R1450 (RECOMMENDED MAX PICKING DISTANCE WITH EXTRA REACH BRACKET BUT NO LABEL ORIENTATION)

R1250 (RECOMMENDED MAX PICKING DISTANCE WITHOUT EXTRA REACH BRACKET)

R1050 (RECOMMENDED MAX PICKING DISTANCE WITH EXTRA REACH BRACKET AND LABEL ORIENTATION)

RECOMMENDED GRIP ZONE

PALLET ORIGIN

ROBOT BASE POSITION

