

Thank you for purchasing a FANUC Robot.

READ THIS FIRST

Use this guide to unpack, install, turn on, and jog your new FANUC robot.

The appropriate level of safety for your application and installation can best be determined by safety system professionals. A qualified electrician should apply power. FANUC recommends that each customer consult with such professionals in order to provide a safe application, and take the necessary FANUC training course to operate the robot safely. Refer to your FANUC documentation provided with your robot for safety procedures.

Required Tools

- ◆ Straight-head screwdriver ◆ Torque wrench
- ◆ Cross-head screwdriver ◆ Metric hex-head wrenches

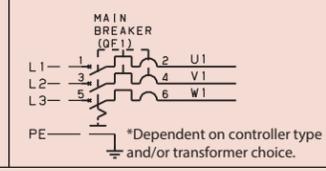
Required Items

- ◆ Properly rated transport equipment
- ◆ Customer-supplied properly rated power source as specified on the Controller Power Source Label
- ◆ Customer-supplied properly rated input power cable
- ◆ Multimeter ◆ Rigid platform to hold robot
- ◆ Mounting bolts ◆ Loctite #242
- ◆ Mounting washers ◆ Robot-specific Mechanical Unit Operator's manual

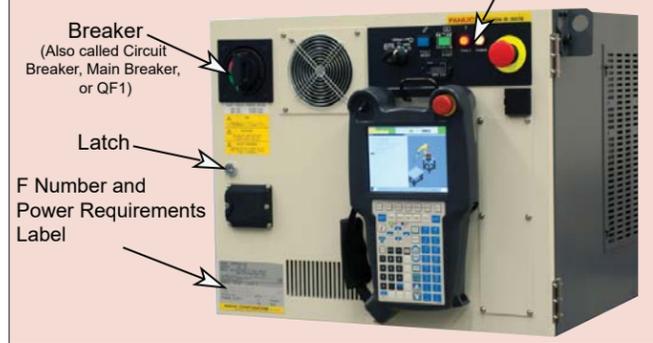
Optional Items

- ◆ Strain relief cable grip
- ◆ Robot locator pins

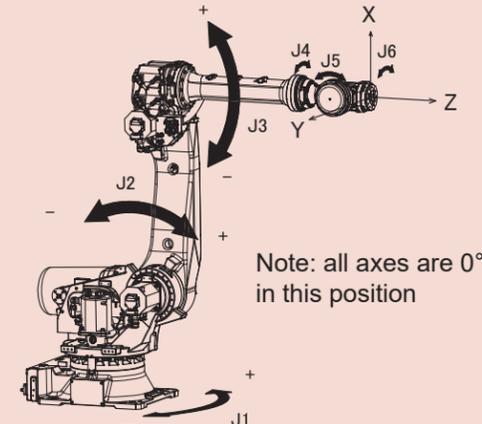
Three Phase 440-500VAC *



Controller



Robot (Mechanical Unit) with joints indicated



R-2000iC/165F robot shown

A. Unpack and Install your Controller

Shipment Contents



1. Cut the base of the plastic covering all the way around the robot and controller. Remove and discard the plastic. Open all of the boxes included in the shipment.

Store these items in a safe, known location.

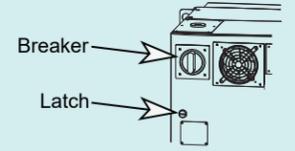
4. Connect the controller to power.

⚠ WARNING
Lethal voltage is present in the controller whenever it is connected to a power source. Be extremely careful to avoid electrical shock. Lock out and tag out the power source at the controller according to the policies of your plant.

4a. Determine the power requirements for your controller from the label on the front of the controller door.

4b. Open the controller door by using a straight-head screwdriver to turn the latch, then turn the Breaker counter-clockwise past its off position.

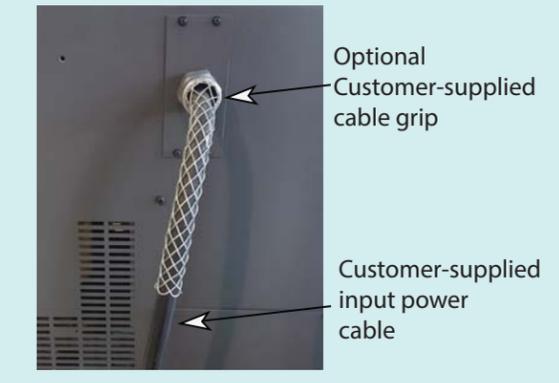
Note: Breaker and latch location may vary depending on controller type.



4c. Route the user-supplied power cable into the controller. Depending on the controller type, access is either through the hole on the left side of the controller (remove white plug shown below), or through the cable entrance and seal block located on the lower right side of the controller.

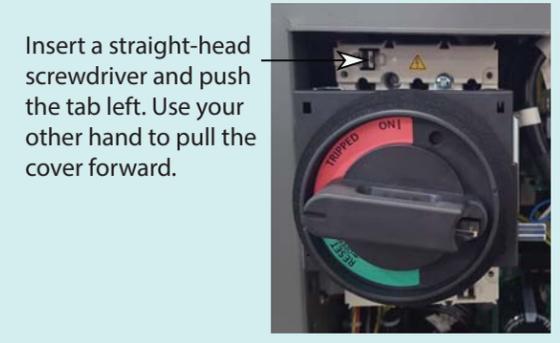


4d. If the user-supplied input power cable is routed through the hole on the left side, it is typical to purchase and install a strain relief cable grip (example shown below) to remove stress on the power cable connections and isolate the power cable from the controller cabinet.



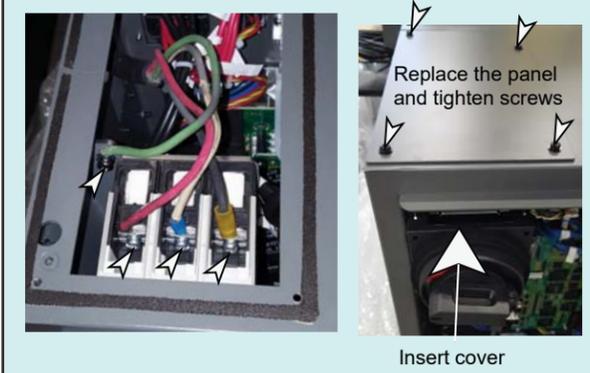
4e. To connect power, remove the plastic cover from above the Breaker (see the diagram below.) To remove the cover, insert a straight-head screwdriver into the opening, and push the tab to the left allowing the cover to slide forward.

Note: Your Breaker and plastic cover might differ slightly depending on your controller type.



4f. Verify that the input power cable is not energized. Connect it to the terminals.

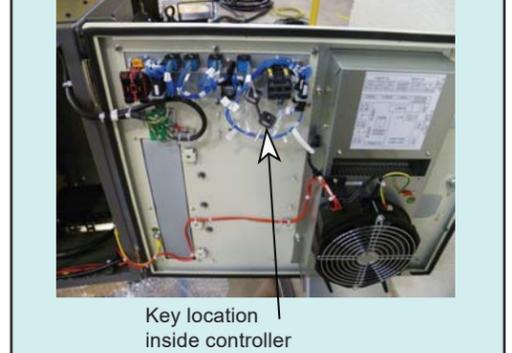
Note: An A-Cabinet connection is shown on the left, below. Your controller cabinet might not be equipped with the access panel shown and the Breaker might be on the other side.



4g. Re-insert the Breaker cover and click it into place. If equipped, place the Breaker access panel back over top of the breaker and secure with four screws.

4h. With the Breaker still off, energize the input power cable and use a multimeter to verify the correct voltage is present via the holes in the Breaker cover.

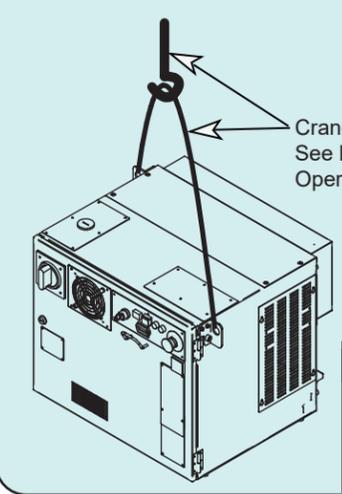
4i. Before you close the controller door, cut loose the set of keys from inside the door, and store them in a known location outside of the controller for use later in this guide.



4j. Close the controller door and use a straight-head screwdriver to turn the Latch on the outside of the controller, securing the door.

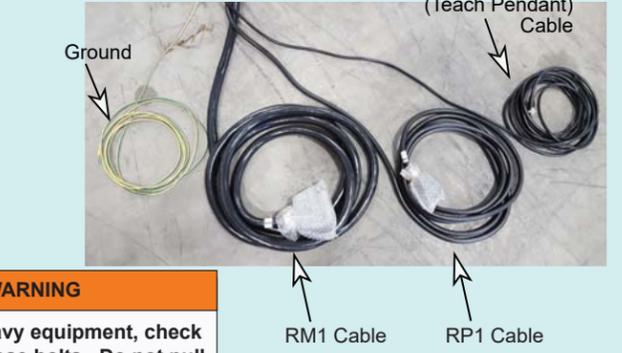
Controller installation is complete. DO NOT TURN ON THE CONTROLLER UNTIL YOU ARE INSTRUCTED TO DO SO. Go to **B. Unpack and Install your Robot.**

2. Use properly rated equipment to remove the controller from its box.



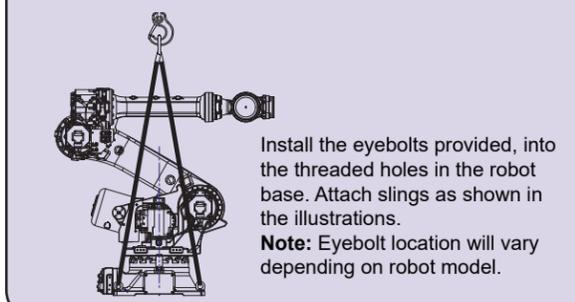
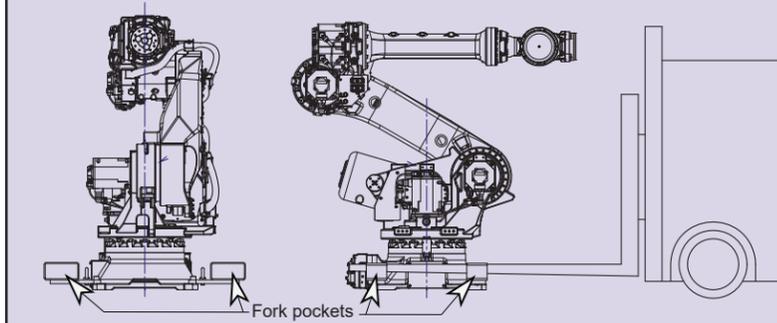
⚠ WARNING
Before moving heavy equipment, check and tighten any loose bolts. Do not pull eyebolts sideways. Otherwise, you will injure personnel or damage equipment.

3. Place the controller in a safe location where the grounding wire, RM1, and RP1 cables can reach the robot, and the controller is safely reachable from outside of the robot work area. **Note:** Some controllers combine RM1 and RP1 into one cable.



B. Unpack and Install your Robot

A forklift or a crane may be used, depending on the robot model. **Note:** The R-2000iC/165F robot is shown.



⚠ WARNING
Before moving heavy equipment, check and tighten any loose bolts. Do not pull eyebolts sideways. Otherwise, you will injure personnel or damage equipment.

5. Remove the bolts holding the robot to the skid.

6. Use properly rated fork lift or crane to move the robot to its new location.

Forklift capacity must be sufficient to support the robot.

Crane and/or sling capacity must be sufficient to support the robot.

Refer to your Mechanical Operator's manual for more information.

Go to Page 2



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Your actual teach pendant key locations could vary.

ON/OFF Switch: Allows/prohibits jogging if the teach pendant enabling device (or DEADMAN switch) is also pressed.

Screen: Displays software menus.

EMERGENCY STOP BUTTON: Stops a running program, turns off drive power to the robot servo system, immediately applies robot brakes and stops the robot.

POWER LED: Green when controller power is ON.

MENU Key: Displays the screen menu.

FAULT LED: Red when a robot fault has occurred.

FCTN Key: Displays the supplementary menu.

Jog Keys: Use these keys to move the robot.

COORD (Coordinate) Key: Use this key to select the jog coordinate system.

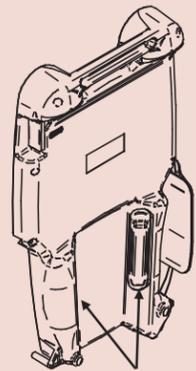
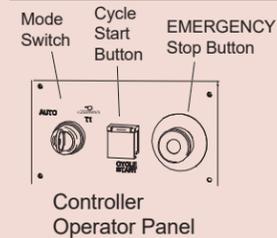
HOLD key: Use this key to bring the robot to a controlled stop.

Speed Override Keys: Use these keys to adjust the speed of the robot when it moves.

-X (J1)	+X (J1)
-Y (J2)	+Y (J2)
-Z (J3)	+ (J3)
-X (J4)	+X (J4)
-Y (J5)	+Y (J5)
-Z (J6)	+Z (J6)
- (J7)	+ (J7)
- (J8)	+ (J8)

Refer to your *Application-Specific Setup and Operations Manual* for more information on each teach pendant key.

iPendant (Teach Pendant)



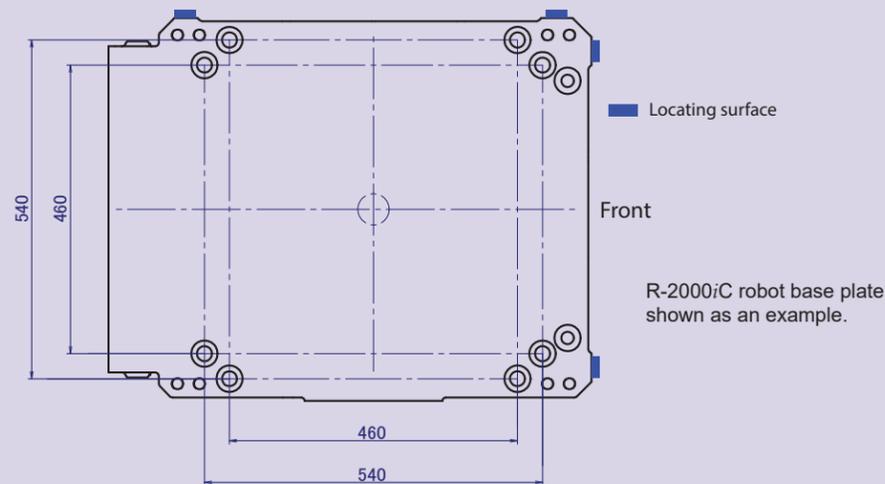
For more information

- Controller Hardware/Electrical *Controller-specific Maintenance Manual*
- Software Installation *Controller-specific Software Installation Manual*
- Robot Hardware Operations *Robot model-specific Operator's Manual*
- Software Operations *Application-Specific Setup and Operations Manual*
- Alarm Recovery *Controller-specific Error Code Manual*

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B. Unpack and Install your Robot continued

7. Fasten the robot base to the base plate. For size, tensile strength, and torque spec, see the robot-specific Mechanical Unit Operator's manual. If the highest accuracy is desired, locator pins can be used to ensure the robot and a future replacement are mounted in the same location.



10. Connect the teach pendant to its cable as shown below.



Rotate the teach pendant cable until it is seated. Then, spin the end of the connector until it is threaded on tight. Wiggling the connector might let you tighten it more.

Robot installation is complete. You are now ready to go to **C. Turn on your Controller**.

C. Turn on your Controller

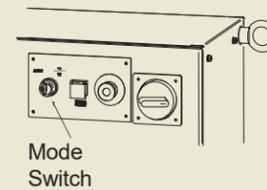
WARNING

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11. Turn on the controller by rotating the Breaker clockwise to ON.

12. Locate the Mode Switch on the Controller Operator Panel. Use the keys retrieved in Step 4i to switch to T1 mode. T1 mode limits the robot speed to 250mm/sec and requires robot control to be at the teach pendant only.

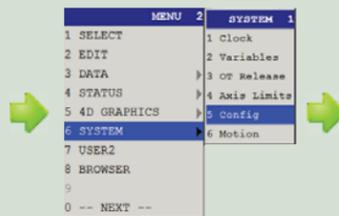
Note: Location of Mode Switch might vary depending on controller type.



D. Jog your Robot

15. To jog the robot in JOINT mode:

- Turn the teach pendant ON/OFF switch to the ON position, press MENU, move the cursor to ALARM, and press ENTER.
- To toggle between alarm history and active alarm display, press F3.



```
System/Config 42/59
41 Signal if OVERRIDE = 100 DO[ 0]
42 Hand broken : <*<GROUPS*>
43 Remote/Local setup: OP panel key
44 External I/O(ON:Remote):DI [ 0]
45 UOP auto assignment: Full
46 Multi Program Selection: TRUE
47 WAIT at Taught Position: TRUE
48 Brake control ECO mode: FALSE
49 J7,J8 jog key Setup : <*<DETAIL*>
50 Collection name(F1): [STYLE ]
51 Collection name(F2): [COL ]
```

```
System/Config 7/59
1 Use HOT START: FALSE
2 I/O power fail recovery: RECOVER ALL
3 COLD START Autoexec program:
[*****]
4 HOT START Autoexec program:
[*****]
5 HOT START done signal: DO[ 0]
6 Restore selected program: TRUE
7 Enable UI signals: FALSE
8 START for CONTINUE only: FALSE
9 CSTOPI for ABORT: FALSE
```

- If this is a new robot with no gripper or End of Arm Tooling (EOAT), you must disable the hand broken check (error **SRVO-006 Hand Broken**). To do this,
 - Press MENU, select 0 (Next), and select (SYSTEM), and then select CONFIG.
 - Use the teach pendant arrow keys to move the cursor to the Hand Broken option, and press ENTER.
 - Use the teach pendant keys to disable the hand broken setting for each motion group. **NOTE:** It might already be disabled on your system.

- If the error **MCTL-013 ENBL input is off** is displayed in the alarm history when you try to move the robot (it will not display as an active alarm) you must disable UI. To do this,
 - Press MENU, select 0 (Next), and select (SYSTEM), and then select CONFIG.
 - Use the teach pendant arrow keys to move the cursor to the Enable UI signals option.
 - Use the teach pendant keys to set the option to FALSE.

e. For some heavy payload robots, if no tooling is attached, a SRVO-050 alarm might occur when jogging is attempted. In this case, the payload will need to be set to zero with the payload schedule enabled. See your software operation manual for more information.

f. Ensure the Emergency Stop buttons on the teach pendant and controller are popped out. If not, twist the button clockwise to reset.

g. Press and hold a DEADMAN switch on the back of the teach pendant in its middle position. Press RESET on the teach pendant to clear alarms.

h. To move each joint axis of the robot (*jog the robot in JOINT mode*), press and hold SHIFT and press each jog key one at a time and watch the robot joint move.

i. Ensure you are able to jog each robot joint.

Turning on and Jogging the robot is complete. You are now ready to perform software installation, if necessary. Refer to the *Controller-specific Software Installation manual*.

8. Connect the ground wire from the controller to the robot base as shown below.



9. Connect RM1 and RP1 from the controller to the robot as shown below. These cables are also referred to as the Robot Connection Cable (RCC). **Note:** Some robots have one connector, combining RM1 and RP1.



Push plugs in. Secure with clips.