ROBOTICS

Operating manual

Emergency safety information

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Operating manual
Emergency safety information

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Original instructions.

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Overview of this manual

About this manual

This manual contains information for emergency situations in the robot.

Note

Before any work on or with the robot is performed, the safety information in the product manual for the controller and manipulator must be read.

Note

This manual must always be stored together with the robot!

This manual must always be easy to access for an operator, service engineer, or anyone using or working with the robot.

Note

It is the responsibility of the integrator to provide safety and user guides for the robot system.

Prerequisites

Maintenance/repair/installation personnel working with an ABB Robot must:

- be trained by ABB and have the required knowledge of mechanical and electrical installation/repair/maintenance work.
- read the user documentation before performing any installation or service work on the robot.

References

The documents listed below describe the robot in detail, including service and safety instructions. All documents are available on myABB business portal, *www.myportal.abb.com*.

Reference	Document ID
Safety manual for robot - Manipulator and IRC5 or OmniCore controller [i]	*3HAC031045-001*
Product manual for the manipulator	
Product manual for the controller	

[i] This manual contains all safety instructions from the product manuals for the manipulators and the controllers.

Revisions

Revision	Description
-	First revision.
A	Polish translation added.

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Revision	Description
B	IRB 360, IRB 6640, and IRB 6660 added. Russian translation added.
C	IRB 4600 added.
D	IRB 120, IRB 2600, IRB 6620LX, and IRC5 Compact added. Hungarian translation added.
E	Updated safety signal graphics for the levels *Danger* and *Warning*.
F	IRB 460 and IRB 760 added. Warning added to section *Main switch on page 9*.
G	IRB 1620ID added. Deleted section "External power supply for brake release unit". How to connect an external power supply for the brake release buttons is described in each manipulator manual.
H	IRB 1620ID removed. IRB 1520ID added.
J	IRB 6700 added.
K	IRB 1200 added.
L	IRB 14000 added. IRB 8700 added.
M	IRB 910SC added. IRB 1660ID added.
N	IRB 6790 added.
P	OmniCore added. IRB 910INV added. IRB 1100 added. IRB 14050 added.
Q	IRB 1300 added.
R	IRB 390 added.
S	Restructured section *Manually releasing the brakes on page 10*. Removed product names where the information is generic.

1 Emergency safety information

1.1 Stopping the robot and switching off the power

Emergency stop buttons

Press any of the emergency stop buttons immediately if a person is at risk in the working area of the robot, or if the robot causes harm to equipment.

There can be more than one emergency stop button depending on the cell design.

Main switch

The controller has one main power switch, usually located on the front.

Note

Your plant or cell may have additional equipment that may also need to be disconnected from the power. See your plant or cell documentation where these switches are placed.

Each connected drive module, or other connected modules such as a spotwelding cabinet, has its own main power switch. On other types of cabinets, the power switch is often placed top left on the front of the cabinet.

WARNING

It is only the main switch on the drive module that will switch off the power to the entire system in a MultiMove system (control module and drive module) if the power supply to the control module comes from the drive module.

Recovering from emergency stop

Make sure the hazardous situation that resulted in the emergency stop condition no longer exists before resetting the emergency stop button.

All push-button style emergency stop buttons have a latching feature that must be released in order to remove the emergency stop condition.

All automatic emergency stop devices also have some kind of latching feature that must be released. See your plant or cell documentation.

1.2 Manually releasing the brakes

Overview

Make sure that any attempt to release a person trapped by the robot arm does not further increase the risk of injury.

Releasing the robot holding brakes will make it possible to move the robot manually, but only small robots are light enough to be moved by human force. Moving larger robots may require using an overhead crane or similar. Make sure that the right equipment is available before releasing the brakes.

WARNING

Before releasing the brakes, make sure that the weight of the arms does not increase the pressure on the trapped person, further increasing any injury.

WARNING

To use the brake release unit or brake release tool, the brakes must have power supply from the controller or an external power supply.

Releasing a person trapped by the robot arm

Use this procedure to release a person trapped by the robot arm.

	Action	Info/illustration
1	Press any of the emergency stop buttons.	
2	**DANGER** When releasing the holding brakes, the robot axes may move very quickly and sometimes in unexpected ways. Make sure that the weight of the arm does not increase the pressure on the trapped person, further increasing any injury.	
3	Locate the brake release unit. Some robots have a brake release tool. This shall be stored close to the robot.	The brake release unit is placed in the robot frame or base, or on the robot controller. Depending on the robot model, the placing can vary slightly. The brake release unit is protected with a plate or clamp.
4	Release the holding brake on a particular robot axis by pressing and holding the corresponding button on the internal brake release unit. For robots with a brake release tool. Hold the tool against the axis.	The brake will function again as soon as the button is released, or brake release tool is removed.
5	Move the robot so that the trapped person is released.	
6	Help the trapped person and make sure he/she gets medical attention.	

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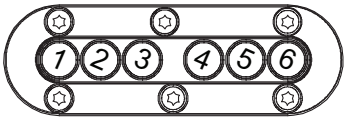
	Action	Info/illustration
7	Make sure the robot cell is cleared so that no one else runs the risks of being injured.	

Brake release unit, axis-by-axis

On many robots there is one button for each axis.

The graphic below shows a brake release unit for a robot with six axes. On four axis robots, buttons 4 and 5 are not used.



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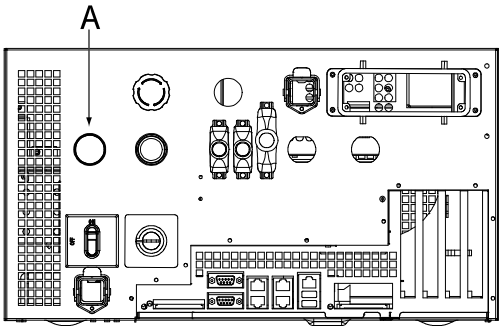
On large robots the brake release unit is located on the robot frame, usually close to the axis-2 motor.

On medium sized robot models the brake release unit is located on the robot base.

Brake release unit, robots with one brake release button

On small robot models there is one button releasing all axes. The brake release unit is located on the robot base.

The IRB 120 robot has no brake release button, instead use the brake release button on the IRC5 Compact controller. For other controller variants, the placing depends on the design of the cell.



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A	Brake release button, IRC5 Compact controller

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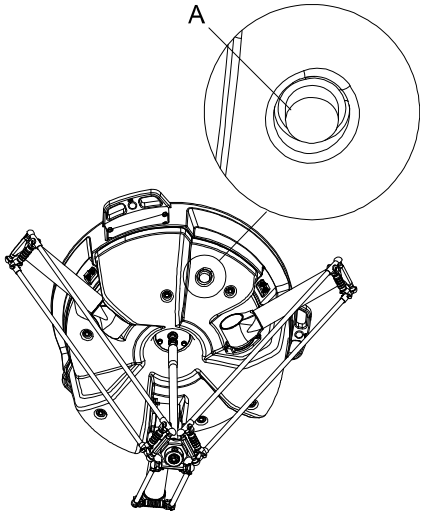
1.2 Manually releasing the brakes
Continued

On the delta robots, the brake release button is located on the base of the robot, close to the center. There can also be an external unit if the access to the base is limited.



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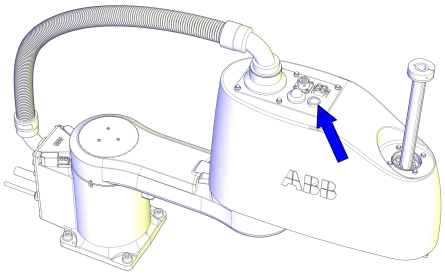
On the table mounted SCARA robots, the brake release button is located on the upper arm. On the inverted SCARA robots, the brake release button is located on the robot base.



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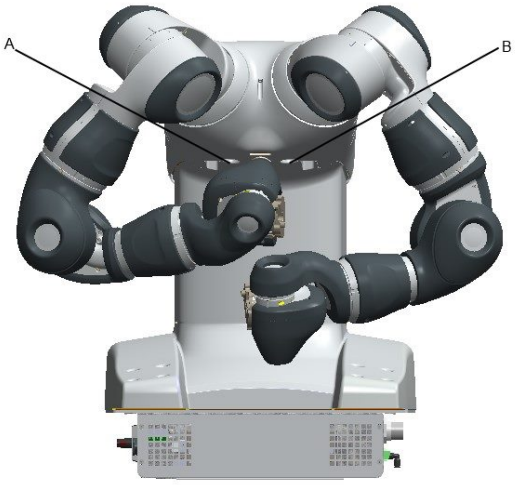
On the IRB 14000 robot, there are two brake release buttons located on the front, one for each arm.



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Brake release tool

For robots with a brake release tool, the brake release points are located on each axis.

1.3 Fire extinguishing

Note

Use a CARBON DIOXIDE (CO_2) extinguisher in the event of a fire in the robot.

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